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THE NORMAL MIND

AN INTRODUCTION TO MENTAL HYGIENE AND THE HYGIENE OF SCHOOL INSTRUCTION

BY

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TO

THE MEMORY OF

MY FATHER AND MOTHER

AS REPRESENTATIVE OF THOSE PARENTS
WHO TRUST THEIR CHILDREN AND
PUT RESPONSIBILITY UPON THEM

PREFACE

This book has to do especially with the mental health of normal children. It maintains the thesis that the essential characteristic of the normal mind is an integration of the personality that makes adjustment possible, and discusses conditions and methods that tend to preserve and develop integration, as well as conditions and practices that tend to disintegration.

The great means of preserving and developing integration is the doing of things that are significant. Thus the book is largely concerned with the psychology underlying the most progressive methods of modern education that put emphasis on doing—the Montessori method, the project method, the Dalton plan, and all active methods that emphasize the activity of the pupil instead of the didactics of the teacher; and, in mental hygiene, vocational therapeutics and the mental hygiene of industry.

James, in his admirable *Talks to Teachers*, said that no one can have an adequate knowledge of modern psychological theory unless he has at some time apprehended the psychology of association in the full force of its simplicity. This point of view is equally important in mental hygiene; and hence the writer has given examples of this psychology of association and treats in considerable detail of the new investigations in regard to the association of stimuli as shown in studies of the conditioned reflex. These studies illustrate the deep-seated and fundamental character of this function of association; but any extended account of the association

of mental processes seems unnecessary and lack of space forbids it.

Although the doctrine of association in its traditional form must be modified in the light of recent investigation, just as the statement of the law of gravitation may have to be modified in view of Einstein's law of relativity, that we can know motion only in relation to other moving objects, it is the function of association that makes higher integration possible; and since association, whether on the higher levels, correlated with consciousness or on the lower levels without consciousness, is largely the same, the lower, the association of stimuli in the form of conditioned stimuli causing conditioned reflexes, may be taken for illustration.

The writer, however, concerned with the application of the psychology of association in mental hygiene, has used the ordinary terminology, but has not, he hopes, misrepresented the facts in their practical relation. He is not concerned with the conditioned reflex as the basis of any theory of psychology, but recognizes it as an objective method of such significance for the study of children and mentally disordered adults that, without a knowledge of it, the mental hygiene of to-day cannot be adequately understood. Mental hygiene, likewise, is not directly concerned with the controversies of the different schools of thought in regard to integration, and the different philosophies, such as the problems presented by Mursell in the *American Journal of Psychology* of January, 1924.

As mental hygiene collects its facts from many different sciences, naturally it uses largely the terminology of these sciences. This is sometimes confusing; for example, the word integration is used in different ways. Although its use in this book may sometimes suggest other meanings of the word, it is used here primarily in

a sense akin to its original connotation. An integer is a whole that has not been broken into parts. Thus an integrated organism, as Koffka defines a *Struktur*, is a combination of phenomena in which every part bears relation to the other parts, and each possesses its own peculiar characteristics only by and through the others; that is, an integer of interdependent parts, not a summation of parts, and a whole that is more than the sum of its elements. While waiting for further investigations and further evidence, we may assume tentatively that a child's personality is integrated at the start, integrated on a low level to be sure, but nevertheless it is an integer, a whole; and healthful development means integration at higher and higher levels.

It will be clear to the reader from the outset, the author hopes, that the truth of the hygienic teachings presented does not depend upon the fitness or even the validity of the illustrations of these truths given, or upon the adequacy of the data here presented. In most cases the investigations thus far made are incomplete, but neither hygiene nor education can wait for the completion of such studies. The health and training of children must be cared for as best we may to-day on the basis of what we already know. Inevitably some of the illustrations are not aptly chosen, and a vast amount of important material must be excluded, but the essential truths presented are significant, however inadequate their illustration.

This book does not treat of intelligence, or imaginal or learning types, or types of attention, or of will; nor of the emotions or the endocrine glands, the Freudian mechanisms, or of the various mental disorders of childhood and youth; nor the special hygiene of the preschool child, or the hygiene of the kindergarten or of the grades, or of adolescence; nor of the conditions of

efficient brain activity, or the period of study; nor of the hygiene of the curriculum, of grading, nor of the details of the hygiene of instruction.

These are important. A chapter on each would be useful; but the limitations of a volume forbid treating all of these subjects. The author has written on some of them in the *Pedagogical Seminary,* and other periodicals; but the largeness of the field has made it necessary to omit from this volume many subjects that should be included in a full treatment of mental hygiene. Even in the relatively small part of the field chosen only a part of the data can be presented.

This book does, however, discuss fundamental principles related to all these subjects, and to mental hygiene for normal children. Some of the most important contributions of mental hygiene have been described; and while this treatment by no means adequately covers the ground, it does serve as a natural introduction to the subject of the hygiene of instruction as well as that of mental hygiene.

It will be noted that many of the illustrations are pathological cases. This is largely necessary because mental hygiene began with the study of the abnormal. Only recently has the mental hygiene of the normal been studied. In many cases also the normal processes are best shown by contrast with the abnormal; and sometimes the normal are presented in large letters in the pathological.

The brief references to the Freudian psychology are sufficient to call attention to the subject. The literature is easily accessible. An adequate treatment would require a volume by itself.

Thus, instead of attempting a systematic and complete treatment of the whole subject, the author has confined himself to illustration of significant aspects of mental

hygiene and the hygiene of instruction in a few important parts of the field. And while no one realizes more keenly than he the importance of the great amount of data omitted altogether and the inadequacy of that presented, the simple, essential truths chosen are things to be emphasized to-day. Hygiene has to do with very simple things, cleanliness, good air, pure water, suitable food, sleep, proper work and rest, protection from infection, and the like. The essentials for mental hygiene are also simple. With some of these this book is concerned. It discusses them with many illustrations and many repetitions.

The book has features that will make it helpful as a textbook; first, a few simple and fundamental matters have been emphasized and repeated in many forms; and second, the main thesis of the book, the attempt to show the importance of the task as a condition of education and mental health alike, has been suggested again and again and opportunity for putting this principle into practice furnished by the bibliographies, that make extensive further study possible for those who have time for it, and by the questions placed at the end of each chapter giving concrete tasks and problems, and, in general, by the suggestion of tasks for those in many fields, hygienists, social workers, teachers, and tasks galore for critics and cynics.

If any words of warning are needed, the student who has had little psychological training can omit the summary at the close of the discussion of the conditioned reflex and some other more technical parts without losing the essential treatment of the subject.

Some readers will be troubled by the use of the word "task." Teachers especially dislike the disagreeable connotation of this term. It is adopted, however, for several important reasons: first, because this is the only

general word we have to denote a serious occupation of any kind whatever, either in work or play, in industry or the fine arts, involving purposive activity, whether physical or mental; second, because what children, even young children, especially desire, is the opportunity to do some serious bit of work; third, because to-day there is need of calling attention to the serious and significant meaning of education; fourth, because it is largely the giving of a task, a serious occupation, that makes freedom safe, since the demands of a freely chosen task are themselves imperative; fifth, because recent usage sanctions a new meaning of the word "task," as when we speak of a task like that of the artist, worth while for its own sake, or a great task one chooses as a life work.

Careful students of education to-day are forced to the belief that what teachers and parents need more than anything else is to get the point of view of mental hygiene and a knowledge of the simple fundamental conditions of healthful mental development. However named, a consensus of the competent has always placed mental health above every other good—whether called, as by Plato, the health of the soul, or, as by the older psychologists and educators of modern times, the harmonious activity of body, mind, and spirit, or, as by modern psychologists and hygienists, merely the health of the mind, using this in the broad sense of the term to include all the mental processes referred to by the older writers.

This point of view and this knowledge are needed by all those who attempt to train children, normal or abnormal, because otherwise the trainers themselves fail to see the significance of the simple activities of childhood, and because without this they fail to see the sacredness of the child's own task, however trivial, if freely done, productive and purposeful. They need this also to show them that the one great aim of education in the

period of childhood, which Dr. White has called the golden age of mental hygiene, is the preservation and development of the health of the mind.

Every subject of instruction, every pedagogical principle and method should be studied with regard to their significance for healthful mental development, as well as with regard to their narrower educational significance. While the writer has presented the teachings of the hygiene of instruction more concretely in articles in Monroe's *Cyclopedia of Education* and many periodicals, there is space to give in this volume only the general principles that underlie the subject and some illustrations of their application.

With the general public the subject of hygiene has a fourfold handicap:

1. Because its teaching concerns very simple matters—good food, pure water, clean air, and the like; and in mental hygiene, attention, orderly association, wholesome interests, self-control—mere common sense.

2. Because, since the aim of hygiene is prevention, if it is successful nothing happens, and the comment is easy that it would have been so anyway.

3. Because we know relatively little yet of the detailed facts about health conditions. It is still the "science of the future."

4. Because in the present undeveloped condition of hygiene, especially of mental hygiene, it is easy to criticize any attempt to state principles or rules or even the conditions of health. It is easy for the cynic to point to the complexity of the mental life and to maintain there is no such thing as principles of mental hygiene.

By calling attention, however, to the simple things we do know, hygiene has increased the average length of human life from 41 years in 1870 to 56 years at the present time. The writer believes that the application

of the simple knowledge we already have of the conditions of mental health would improve human health everywhere—that it would be helpful to the schools, would prevent many neuroses, and favor the mental health and increase the efficiency of all normal children, and afford a social training vitally important for the health of the state.

The writer has now a pleasant task, although one that can be only inadequately performed, to express his cordial thanks to the many persons to whom he is indebted for aid in the preparation of this book. To the publishers mentioned in the bibliography or in footnotes who have kindly granted permission to use the quotations cited in the text; especially to the publishers of *Scribner's Magazine, Mental Hygiene, School and Home,* the *American Journal of School Hygiene,* the *Pedagogical Seminary,* and the *American Journal of Psychology,* and the Massachusetts Society for Mental Hygiene for permission to reprint articles in whole or in part.

To many American psychologists, psychiatrists, and hygienists who have given aid and suggestions, especially to Dr. George K. Pratt, Medical Director of the Massachusetts Society for Mental Hygiene; Dr. Frankwood E. Williams, Medical Director of the National Committee for Mental Hygiene; to Dr. George E. Humphrey of Wesleyan University, and Dr. Arnold Gesell, Professor of Child Hygiene at Yale University, who have read portions of the manuscript or given helpful suggestions.

To his present and former students whose sympathetic interest and coöperative attitude has been a constant stimulus of inestimable value. For more direct aid, besides those mentioned in the bibliography, to C. A. Dickinson for two illustrations; to Prof. E. W. Flagg and M. A. Tinker for critical reading of a part of the manuscript; and to his teachers and colleagues, past and

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To Josephine Burnham of the University of Kansas for encouragement and helpful criticism; to Grace Burnham of St. Louis, to whom the author is indebted for reading nearly all of the manuscript and for making invaluable suggestions; to his secretary, Marion Ross, who has not only typewritten all the manuscript, read the proof, and prepared the index, but has also furnished valuable material and helped in a thousand ways that made the publication of the book possible; and finally, to his great teacher, chief, and friend, G. Stanley Hall, for whose sympathy, stimulus, and inspiration it would be futile to attempt an adequate expression of indebtedness. Without placing the responsibility for the views presented upon any one of those who have kindly aided him, to these and many others the writer expresses his great indebtedness.

W. H. B.

CONTENTS

		PAGE
PREFACE	. . . . .	vii
CHAPTER		
I.	INTRODUCTION	1
II.	THE NORMAL MIND	27
III.	THE CONDITIONED REFLEX	61
IV.	THE CONDITIONED REFLEX IN THE CHILD . .	87
V.	THE CONDITIONED REFLEX: HYGIENIC SUGGESTIONS	114
VI.	THE CONDITIONED REFLEX: CONCLUSIONS .	144
VII.	HABITS, OR SYSTEMS OF CONDITIONED REFLEXES	170
VIII.	THE SCHOOL TASK	205
IX.	THE SOCIAL TASK: THE ADJUSTMENT OF TASKS	231
X.	THE MENTAL ATTITUDES	283
XI.	SUGGESTION AND EDUCATION	312
XII.	CONDITIONS OF INHIBITION	352
XIII.	INHIBITION OF THE INHIBITIONS	388
XIV.	INHIBITION; FEAR	417
XV.	SUCCESS AND FAILURE AS CONDITIONS OF MENTAL HEALTH	451
XVI.	ORDERLY ASSOCIATION AS A CONDITION OF MENTAL HEALTH	488

CHAPTER PAGE

XVII. Discipline and the Mental Health . . . 532

XVIII. Pseudo-Feeblemindedness 567

XIX. The Response and the Task in Pathological Cases 599

XX. The Principles of Mental Hygiene . . . 641

XXI. Summary and Conclusion 677

Index 689

GLOSSARY

Most of the terms used may be found in the dictionary or are explained in the text. A few more uncommon words are explained below.

ANABOLISM. The building up of tissue.

ASTIGMATISM. A refractive error of vision, usually due to unequal curvature of the vertical and the horizontal meridians of the cornea of the eye.

ATROPHY. The wasting of an organ or part of the body.

AUFGABE. The task or goal.

COMPLEX. A group of associated ideas often producing abnormal mental conditions.

CONDITIONED EMOTION. An emotion caused not by the natural stimulus but by one associated with it.

CONDITIONED REFLEX. A reflex caused by a stimulus associated with the biologically adequate stimulus.

CONDITIONED STIMULUS. A stimulus associated with a natural stimulus.

CRETINISM. Arrest of physical and mental development in childhood due to defect of the thyroid gland.

DEMENTIA PRÆCOX. A general term for a common form of adolescent insanity.

DETERMINING TENDENCY. A general term for a mental attitude or disposition that determines action.

EINSTELLUNG. A general term for the mental attitude.

INHIBITION. The act of restraining or repressing a muscular, nervous, or mental process.

KATABOLISM. The breaking down of tissue.

METABOLISM. A general term for the processes of anabolism and katabolism.

MORON. A grade of feeble-mindedness only relatively little below normality.

MYXŒDEMA. A disorder of physical and mental development due to defect of the thyroid gland.

NEENCEPHALON. The new brain or the brain cortex and its appendages.

NEURASTHENIA. A chronic state of nervous exhaustion.

NEUROSIS. A nervous disorder.

NEUROTIC. Predisposed to nervous disorders.

ONTOGENETIC. Pertaining to the evolution of the individual in contrast to that of the species.

PALEENCEPHALON. The old brain, a general term for the lower levels of the brain below the cortex and its appendages.

PARANOIA. A mental disorder characterized by systematic delusions of persecution.

PATHOLOGICAL. Pertaining to disease.

PHYLOGENETIC. Pertaining to the evolution of the species.

PROPHYLAXIS. Prevention of disease.

PSEUDOFEEBLE-MINDEDNESS. A mental condition that is not feeble-mindedness but simulates it.

PSYCHIATRY. The branch of medicine that relates to mental disease.

PSYCHOANALYSIS. A method of treating functional mental disorders by analyzing the mental content.

PSYCHONEUROSIS. A nervous disorder involving special mental symptoms.

SUBLIMATION. A higher emotional or other response substituted for a lower one.

SUGGESTION. A stimulus that touches off a determining tendency.

SURROGATE. A substitute response.

TOXIN. A poison usually of metabolic, bacterial, or vegetable origin.

UNCONDITIONED REFLEX. An ordinary reflex caused by a natural or biologically adequate stimulus.

VORSTELLUNG. Whatever is placed before the mind, an image or idea.

THE NORMAL MIND

CHAPTER I

INTRODUCTION

Hygiene and Education

AFTER more than fifty years of modern scientific study of child hygiene, it is now possible to state a few fundamental general truths in regard to the relation of the school to the child's health. Put rather dogmatically for the sake of brevity these are as follows:

1. *The Aims of Education and Child Hygiene the Same.*—First of all, the fundamental aims of education and of child hygiene are the same: normal healthful development and the acquisition of habits of healthful activity, physical and mental.

For the early period of school life, in the kindergarten and the elementary grades at least, the primary aim of education should be health. The child's first business is to grow and to develop. Everything else can wait, but the demands of health are imperative. At present there is no consensus among educators in regard to the aim of formal education. This is amazing; but if pedagogy does not know the aim of education for this early period, then pedagogy should give place to hygiene, for hygiene does know the aim definitely—health, adjustment to a normal environment, and the acquisition of those habits of activity physical and mental that represent the alphabets of health for every one.

2. *The Child Is Different from the Adult.*—Physically and mentally the child is literally a different creature from the adult. Hence both our educational methods and hygienic training should be determined from the genetic point of view. This is obvious from what has already been said. In the early period the maximum of freedom for spontaneous motor activity out-of-doors is essential, in order that the child may make his own adjustments as a reacting organism to a natural environment. In the elementary grades the emphasis is naturally on the acquisition of the alphabets of learning and health and morals. In the high school the emphasis shifts, and the aim is more healthful adjustment to social environment; and, so far as the individual is concerned, self-discovery, self-adjustment, and mental, as well as somatic, hygiene.

3. *The Correlation of Hygienic Activities.*—We now see clearly that organization of hygienic activities is necessary. The health interests of the members of a community, of the state, and of the nation, are all bound up together, and as regards pure food, pure water, pure milk, protection from infectious disease, and the like, the health interests are common interests, and the health of the child is only the most important part of public health.

The opportunity of the school for public health is obvious from the fact that in the school all the children of the community are brought together; here conditions can be organized with regard to the health of the children directly and public health indirectly, and here, too, is the grand opportunity for prevention of disorder, physical and mental.

4. *The Importance of Training in Hygiene.*—Modern investigations and modern studies of education and

hygiene have at least clearly shown that it is training in hygiene, not mere instruction, that really counts. However important instruction may be, it is secondary and subsidiary, and is most effectively given on the basis of individual training. Hence, the significance of the aim in the various child-welfare societies actually to develop habits of health among school children.

5. *The Importance of Mental Hygiene.*—One of the greatest advances in child hygiene in recent years is the insight that mental hygiene is quite as important as somatic hygiene, and that objectively excellent methods in hygiene, important rules of health and significant teaching, all avail nothing unless right mental attitudes and right habits of healthful mental activity are developed. Thus in connection with every school subject, even every lesson in child hygiene, and every form of motor training, the dictates of common sense and the plain teachings of scientific mental hygiene are to be considered as well as those of physical hygiene.

6. *What Can Be Done.*—To the practical question, what can be done to-day, the answer is, the key to the situation is in the training of teachers. In matters of health, as in other things, school reform is always schoolmaster reform. For proper health training, properly trained teachers are necessary. No textbooks, no rules for instruction and training, no code of health morals, no methods or devices, however clever, can take the place of good teachers. To insure good teachers, they themselves must be trained in the essential habits of health, given the scientific attitude, a broad perspective, and the genetic point of view, so that lessons may be adapted to individual children and the concrete situations of the schoolroom.

This movement for training of teachers in child

hygiene is of the greatest significance; but from the outset the instruction and training should be rigorously scientific.

The history of hygiene is instructive. Even in modern times children have suffered from the hands of the hygienists. The story is pathetic. They have been dosed with things vile of every description, from calomel and tobacco to human excretions. Even in modern times surgeons have advised slitting the gums, making the incision deep, clear to the bone, in order to ease their teething. At the time of the Great Plague it is reported that children in the schools were forced to smoke tobacco for the sake of their health, and in recent years physicians in the southern states have sometimes prescribed the use of tobacco for the hookworm disease. Even with our modern scientific cure for the hookworm disease, probably children to-day in some parts of the south are using tobacco as a remedy.

Even the history of scientific child hygiene has not been free from error. The pathway is strewn with the fragments of exploded theories. To recount the errors even in regard to bad air and the ventilation of schoolrooms would be a long story, at the core of which would be perhaps the gruesome warnings in regard to carbon dioxide as a deadly poison and schemes of ventilation based on this idea, although for more than thirty years we have known that CO_2 in ordinary rooms is a harmless gas, and for some ten years we have known that in right proportions it is as essential for human health as oxygen itself.

The lesson is obvious. As others have fallen into error, so may we. No one, because he lives in the twentieth century, can claim immunity from error; and the teachers, lacking proper training and using textbooks

that teach error, cannot be blamed. The only safety is the acceptance of no hygienic doctrines as true that can not be verified by the scientific method.

Among the dangers to health in the schoolroom is the conscientious teacher of hygiene who lacks knowledge. The old physician Gazius who taught the danger of bathing, the teachers in the English school that punished their children for not smoking, those of a later age who condemned night air and the drinking of water, the kindergartner of to-day who trains her children in songs beyond the compass of their voices, the teacher in the high school who forces the pubescent boy to sing when his voice is in the period of mutation, the dietitian who is satisfied with calories without vitamines, or perchance with vitamines without calories, and the hygienist who worries the children about malaria where there are no mosquitoes—all alike are conscientious.

Thus the success or failure of the hygienic training of teachers will depend upon whether this education is truly scientific or not.

While some of us would go farther and make health the primary aim of all education in the early years, all should emphasize the need of the scientific attitude, of perspective, and of mental hygiene. More concretely, teachers should learn that some children and some adults need most of all to forget their own health; that what is one child's food may be another child's poison; that while both instruction and training are necessary, instruction is especially for the teacher, training for the pupil; that while talk about hygiene may have flushed the cheeks of eager teachers, it never painted the cheeks of children; that only actual practice of health habits counts; that it is dangerous to teach what is not true;

and that in cases of doubt, when one does not know what to do, the only safe rule is to let nature alone.

The service the school can render to the child's health and indirectly to public health is equaled only by the service of the home for the pre-school child. To the door of the schoolhouse the child brings not only the inheritance of the ages, but the result of six long years of training in the home and on the playground or the street: not only the primitive emotions of fear, rage, love, and the fundamental instinct to activity, but associated fears, conditioned reflexes, habits, attitudes, some distinctly habits of health, some distinctly injurious. Thus the school beginner is by no means a *tabula rasa.*

7. *A Health Examination of Beginners.*—The strategic point of attack in school hygiene to-day is at the entrance of school life.[13] * Here a thoroughgoing health examination, physical and mental, is necessary. This is merely common sense, and it is imperative that teachers should know the character of the training children have received in the pre-school period. Just as at college entrance it is sound pedagogy and common sense to inquire into the mental ability and the high school training of candidates for the college—and every institution finds this necessary—so it is perhaps even more important to know the associations, attitudes, inhibitions, mental twists and the like that children bring with them to school as the result of their pre-school training, good or bad.

Only by a thoroughgoing examination of this kind at the beginning of school life can the necessary cooperation of teachers and parents be obtained. Only thus can the children needing special care be selected,

* References are to the corresponding numbers in the bibliography at the end of the chapter.

the health of the normal children be preserved, retardation and failure prevented, and the teacher's time and strength conserved. The first months of school life amount to little for formal education but are invaluable for health and should be devoted to this. Such a plan is only common sense and merely justice to the taxpayers and children alike.

The failure to give such a competent examination at the entrance to school life and the ordinary plan of admitting all children, developed or undeveloped, normal or defective, at the chronological age of six has resulted in the admission of many children not sufficiently developed physically and mentally to do school work, the futile attempt to teach these children, the failure and retardation of many of them made inevitable from the outset, a serious number of failures in the first grade, and a general attitude of hurry and waste and neglect of normal healthful development.

Next to ignorance and error the other great enemy of school hygiene is the scholastic ideal in its narrower form, the tendency to yield to the rush and hurry of the present time and the introduction of narrow efficiency ideals into the schools. With this ideal, attention centers not on the children but on the school curriculum, the exigencies of grading, methods for beginning formal education at an earlier period, devices for acceleration, purely quantitative scales and standards, and, in general, emphasis upon the scholastic product instead of the children to be educated.

From the days of Comenius down, there has always been this tendency to mechanism and haste. No one knows just when or how to begin the formal education of a child, but we feel that we must begin as soon as possible. Long ago, Principal Russell of Worcester,

noting the narrowing space between the cradle and formal education, adapted the words of Falstaff and put them in the mouth of the young child, who exclaims: "Shall I not take mine ease in my cradle?" "No," the new mother will reply, "maturity is knocking at the door; education, culture, duty are already peering into thy cradle. Waste no time here in idle dreaming."

On the other hand, child hygiene, somatic and mental, calls us back to a few very simple fundamental things, and to-day with renewed emphasis it raises the old questions. With Watson, from the point of view of laboratory studies, it asks, if a child's mind be twisted and thwarted and handicapped by injurious conditioned reflexes and habits in the pre-school period, what can the education of the ordinary school accomplish? With Dr. Williams, what would it profit even if all our hygienic ideals were realized, if the children are not happy and attitudes of depression, failure, and the like, are developed? And again, with G. Stanley Hall, what shall it profit a child if he gain the whole world of knowledge and lose his own health, or what shall a child give in exchange for his health? Thus the aim is everywhere primarily health and normal development, physical and mental. No other aim is educationally sane or hygienically sound. Of the vast field covered by this aim the present discussion is concerned with only a small part, namely, an introduction to mental hygiene and the hygiene of school instruction.

The Scope of Mental Hygiene

The aim of mental hygiene is the care of the mind diseased, the prevention of mental disorder, and the development of habits of healthful mental activity.

Strangely enough, the view is widely prevalent that mental hygiene has to do, not with the normal, but with those who have no minds or who have disordered minds, especially the feeble-minded or defective, or else that it is concerned with some fad or mystic cult.

Mental hygiene, however, is no longer concerned merely with the care and prevention of feeble-mindedness and insanity; and, though in the minds of some it may still be associated with certain fads and vagaries, it now rests on a solid foundation of scientific fact, and has already made important contribution to the mental health of normal children and adults. Recent studies, however, have greatly increased the scope and significance of the subject. The best way to show this is by briefly enumerating some of these investigations.

1. *The War and Its Lesson.*—The War greatly increased the scope of mental hygiene. And, on the other hand, mental hygiene made a contribution of vast importance and unprecedented character to the War, in testing the mental ability of the soldiers, in its examination of officers and men for the detection of nervous and mental disorder, in the reëducation of disabled soldiers, and in its aid to the morale of the army. This last is distinctly the aim of mental hygiene; for the conditions of morale and of mental health are practically the same. War is a crucial test of a nation's education; and the behavior of soldiers reflects the character of their training.

Again, the effect of war upon children suggests the need of sound mental hygiene. Investigations indicate that children in war are largely protected from fear and worry by their natural attention to the present and the concrete details of any situation, however terrible; but in prolonged wars the strain has its effect. One of

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The aim of mental hygiene is the care of the mind diseased, the prevention of mental disorder, and the development of habits of healthful mental activity.

Strangely enough, the view is widely prevalent that mental hygiene has to do, not with the normal, but with those who have no minds or who have disordered minds, especially the feeble-minded or defective, or else that it is concerned with some fad or mystic cult.

Mental hygiene, however, is no longer concerned merely with the care and prevention of feeble-mindedness and insanity; and, though in the minds of some it may still be associated with certain fads and vagaries, it now rests on a solid foundation of scientific fact, and has already made important contribution to the mental health of normal children and adults. Recent studies, however, have greatly increased the scope and significance of the subject. The best way to show this is by briefly enumerating some of these investigations.

1. *The War and Its Lesson.*—The War greatly increased the scope of mental hygiene. And, on the other hand, mental hygiene made a contribution of vast importance and unprecedented character to the War, in testing the mental ability of the soldiers, in its examination of officers and men for the detection of nervous and mental disorder, in the reëducation of disabled soldiers, and in its aid to the morale of the army. This last is distinctly the aim of mental hygiene; for the conditions of morale and of mental health are practically the same. War is a crucial test of a nation's education; and the behavior of soldiers reflects the character of their training.

Again, the effect of war upon children suggests the need of sound mental hygiene. Investigations indicate that children in war are largely protected from fear and worry by their natural attention to the present and the concrete details of any situation, however terrible; but in prolonged wars the strain has its effect. One of

the saddest reports of the Thirty Years' War was that the children were no longer seen playing in the streets of the German cities; in some localities in the World War it was said that the children had forgotten how to smile; and the report comes from the institutions for children in Russia that rarely does a visitor hear a child laugh.

Especially important for mental hygiene is the lesson of the war in regard to nervous disorders. Shell shock and similar disorders develop, not as the result of severe wounds and grave lesions of the brain, but rather in the psychic field on the basis of congenital tendencies, special sensitiveness to stimulation, or the like, and after a period of great strain, fatigue and sleeplessness.

Such cases are instructive because they show in large letters what may occur in any individual subjected to sufficient strain. G. Elliott Smith has well stated the relation of the war neuroses to the disorders found in times of peace as follows:[34]

> The incipient forms of mental disturbance which the anxieties and worries of warfare are causing ought to impress upon the attention of every one that such causes are also operating both in war and peace, and are responsible for a very large proportion of the cases of insanity, and it is precisely these cases which, if diagnosed in the early stages and treated properly, can be cured. The chief hope of reducing the number of patients in asylums for the insane lies in the recognition of this fact, and acting upon it in the way of providing institutions where such incipient cases of mental disturbance can be treated rationally, and so saved from the fate of being sent into an asylum.

In order to apply the principles of mental hygiene and to give the mental training that may preserve an individual from nervous disorder and insanity, a great

amount of time is necessary. It would seem almost impossible to supply the necessary institutions for this purpose. It is a question whether it would be desirable to do so. Apparently the only institution where there is time for proper training of this sort is the public school, and here is where the principles of mental hygiene should be applied, and instruction and training adapted to those individuals who are oversensitive to stimulation and liable to become victims of nervous disorder. This can be done, because the form of treatment required is precisely in harmony with the training that is given in the best schools. What is necessary is that teachers should have adequate preparation for such work and that time and attention should be devoted to the detection and care of such children.

With proper training of these children in the public schools the question would soon arise, why must a child be defective in order to have the benefit of mental hygiene, and the demand would be made that all children share in such training, that the principles of mental hygiene be followed in all the methods and discipline of the school, and that all teachers be given a knowledge of this subject and be prepared to follow the well-recognized principles of mental hygiene in all their work.

2. *Studies of the Endocrine Glands.*—Physiological studies, both before and during the War, have placed mental hygiene upon a solid scientific basis. What occurs in the brain when the mind thinks, was the problem attacked long ago by the great Italian physiologist Mosso. And a long series of investigations since have shown definite physiological changes correlated with mental work, changes in the distribution of the blood, an increased liberation of heat, and increased metabo-

lism. The simplest test of these changes is the increased pulse rate that accompanies attention.

Among the most important of the physiological investigations are the studies of the glands with internal secretion, the thyroid, the thymus, the pituitary, etc. Although the function of these glands was not discovered until recent years, a vast literature on the subject has been produced. Biedl, in the second edition of his handbook, although omitting the less important of the older literature, presented a bibliography of 250 large pages.[5] And since that time an enormous number of books and articles have appeared.[6]

These modern studies have shown that not only normal growth and development depend upon the proper functioning of these glands, and that certain forms of feeblemindedness, cretinism, myxœdema, and the like, are caused by defect in one or more of them, but that their normal functioning conditions largely our life of feeling and action.

The fascinating story of the relation of the adrenal glands, for example, to the different emotions and to worry and anxiety, suggests in scientific terms the far-reaching significance of normal mental states for normal metabolism and normal activity of the whole physical organism.

If we can trust the studies of Crile,[20] the physical effect upon the nerves from long continued worry and emotional strain is precisely the same as that brought about by drugs and the toxins of infectious disease; and, on the other hand, just as the injurious effects from the overstrain of the so-called kinetic drive can be remedied in some cases by a suitable operation removing a portion of the overactive gland, or by the use of morphine, in like manner the same effect can be brought about in some

cases by removing the worry, and by sleep and rest, if this be possible.

The results of these studies of the endocrine glands are of great significance for practical mental hygiene, since, apparently, they are not only the vital organs regulating development, but the physical organs to be specially considered in the hygiene of emotion.

3. *The Contributions of Psychiatry.*—Recent studies in psychiatry have also greatly broadened the field of mental hygiene. They have shown the possibility of preventing many forms of mental disorder; especially cases on the borderline between the normal and the defective, cases of the manic-depressive type, the various anxiety neuroses and fatigue psychoses, and even some cases of dementia præcox, where suitable environment and suitable training can be provided.[2] They have shown that in many cases the best means of cure is some form of reëducation involving the development of wholesome interests and regular habits of attention and orderly association. This method, so helpful for cure, appears even more significant as a means of prevention; and thus is opened a wide field for the work of mental hygiene, especially among children and youths. It is a grave reflection upon the schools that so many of their graduates have to be reëducated in the sanitarium or the hospital.

4. *The Contributions of Psychology.*—Psychology in recent years has made many important contributions to mental hygiene. Among the most noteworthy of these are the results of the Würzburg School in Germany and of Baird [29] and their other followers in this country. These investigations have shown that deeper than the life of perception and ideas are the mental tendencies, the sets of the mind, the mental attitudes, and the like. In all education the importance of the mental attitudes

is clear. Pupils carry away very little book learning from the schools, as every teacher knows, but the mental attitudes developed are the vitally important things; and these have a double significance, on the one hand for the mental efficiency of the pupils, and on the other, for their mental health. As Abbot suggests, probably many cases of mental disorder could be prevented by the development of proper attitudes toward life.[2] These attitudes are determined not only in the home, but in the school, by the tasks set for the pupils, by the directions given by the teacher, by the presence and behavior of the other children, and by the whole environment of the pupils.

Many other investigations, especially in experimental psychology, have widened the scope of mental hygiene. Of these one especially noteworthy should be emphasized.

5. *The Conditioned Reflex.*—The most important contribution of psychology to mental hygiene, providing a method of unlimited application, is probably the modern study of the conditioned reflex by the Russian school of Pavlov and his followers.[6 10 27]

A conditioned reflex is a response to a stimulus which has become associated with a biologically adequate stimulus and hence produces the same physiological response. Such reflexes conditioned by associated stimuli may be looked upon as the elements in habit, and a habit may be regarded as a system of conditioned reflexes.

Pavlov has developed an elaborate technique for the study of this subject and has shown that the sensation from any receptor organ—sight, hearing, the dermal senses, etc.—may be made a conditioned stimulus by repeated association with a biologically adequate stimulus. Krasnogorski in Russia, Mateer at Clark Univer-

sity, and Watson at Johns Hopkins have shown that conditioned reflexes can be developed in children, and that the ability to form such reflexes is correlated with the development of the mind and brain.*

All this is of great importance to education and hygiene, for it furnishes an objective method for studying the development of the brain cortex, the organ of association, on the one hand, and the growth of habit in the individual child on the other hand. All training in animals and children consists largely in the acquisition of conditioned reflexes. The significance of such reflexes in education and mental hygiene will be discussed in detail in later chapters.

We know relatively little about the conditioned reflexes developed by our ordinary school and home environment, but the studies made show the vast number of them acquired by a child during the period of school life and the importance of them for the mental health of the individual.

6. *Studies in Psychoanalysis.*—Another class of investigations partly psychological and partly psychiatrical, namely, the studies in psychoanalysis made by Freud [22] and his followers, have contributed much to mental hygiene by showing the great importance of normal emotional and instinctive life in early childhood, the persisting evil results that may come from any unfortunate emotional shock, even in the days of infancy, and the danger from abnormal domestic relations—undue dependence on father or mother, undue repression by the parents, or the like.

These studies are significant, not merely because the psychoanalysts have shown the widely irradiated effects

* For the bibliography see Chapter VI on the conditioned reflex.

of disturbances of normal emotional life, but because this work furnishes illustration of the great principle that opportunity for normal reaction to emotional or instinctive stimuli should be furnished, and of the pathological effects that may occur when such opportunity is not given.

In spite of sometimes fantastic illustrations, Freud has also made important contribution to the general and applied psychology of feeling and association.[22] Just as Pavlov[10] and his school have shown that any sensation whatever from any receiving organ may become associated with an ordinary stimulus and bring about precisely the same physical reaction, so the studies of Freud apparently have shown that, in some cases at least, when a normal reaction is blocked, any kind of a reaction, physical or mental, associated with the ordinary reaction, may take its place and function vicariously.

If in case of children normal reaction is blocked by an effort of the will, if a disagreeable thing is put out of mind, then, according to the psychoanalysts, it is apt to become associated with something else, either with some idea that is endurable, or with some physical pain or the like which is preferable to facing the disagreeable fact. All sorts of defenses of this kind may occur.

7. *Studies in Criminology.*—Modern studies in criminology have also extended the scope and emphasized the importance of mental hygiene. Healy believes that the main avenue of approach to the problem of crime is through mental hygiene, and the insight is growing that a condition of health physical and mental is the best safeguard against anti-social behavior and crime. Glueck has pointed out the difficulties in applying this safeguard in case of criminals;[23] but its importance is clear. In the public schools, where approximately all the chil-

dren and youth of the country are collected, it is possible to provide the health conditions necessary; and, fortunately, what is desirable as a protection against conduct disorders is precisely what is desirable for all children, the normal as well as the abnormal.

Physical Conditions Significant.—Recent studies have emphasized the significance of physical conditions in determining the mental health. Among the many studies of somatic hygiene that have recently contributed to mental hygiene are the special investigations of nutrition and diet. Already their potentially far-reaching significance is suggested by different studies. For a single illustration the work of McCollum at Johns Hopkins University is noteworthy.[28] In his study of rats he finds not only that their health and activity are conditioned by their diet, but, to a large degree, their emotions and disposition as well. For example, a certain diet fed to pregnant rats causes practically all of them to commit infanticide. Feeding a different diet to the rats conditions normal maternal care of the offspring.

As evidence that the writer does not neglect the significance of physical conditions, he would refer to his published papers in which this has been emphasized.[13 14 15] The purpose of the present work, however, is to illustrate the more strictly mental conditions. The studies mentioned above and many other recent investigations in psychology and hygiene have shown the importance of what may be called the mental factor in determining conditions of efficient work and healthful reaction. Even the recent studies of the conditions of the temperature and humidity optimum for mental work reported by the New York Commission on Ventilation indicate that within rather wide limits the mental factor

is more significant than the external physical conditions of the atmosphere in conditioning comfort.[15]

The mental attitudes, interests, and associations are matters definite and tangible, the objective study of which, together with the investigation of the physiological conditions of mental activity, has taken the subject of mental hygiene out of the realm of speculation and fancy and placed it upon a solid foundation of scientific fact. These studies have enormously increased the scope and significance of mental hygiene.

The Function and Aims of Mental Hygiene

Mental hygiene aims to save society from the burden of feeble-mindedness and insanity—a burden the money cost of which is enormous, the results of which in sorrow, misery, and crime are incalculable. It aims, however, not only at the prevention of acute mental disorder, but at the development of wholesome interests and habits of healthful mental activity in all normal children and adults—habits that insure happiness and efficiency as well as sanity. It aims at nothing less than the development of morale in all classes; it aims to develop normal social attitudes, the spirit of coöperation and loyalty, that everyday patriotism which is ready to sacrifice personal interest for the welfare of the social group—the family, the community, the church, the state, the world. It aims at all this both for the health of the individual and for the welfare and sanity of the social group. To realize these aims mental hygiene would apply the simple fundamental principles of mental health in the home, the school, and all agencies for education; it would apply the principles of a fearless democracy, especially in education, to give all the opportunity, according to their ability, to develop the capacity as well as the will for

service, and to become superior men in something, according to their talents. Thus the spirit of coöperation, everyday democracy, and everyday service, are the natural outcome of mental hygiene.

Functions in the Field of Public Health.—More concretely, the manifold functions of mental hygiene in the field of public health may in part be summed up as follows:

1. The care and prevention of feeble-mindedness and mental disorder, the traditional function, naturally the first developed.
2. Care for defective delinquents and the large class of other defectives found in every community.
3. Care for the mental health of normal children, a function that cannot be too strongly emphasized.
4. The development of sane altruism, everyday patriotism, and care for the mental health and morale of all citizens.
5. Care for the mental health of all those who in times of stress are subjected to unusual burdens and anxieties.
6. The hygiene of school instruction, in all the work, discipline, and methods of the school.
7. The mental hygiene of the different groups of professional workers, especially the mental hygiene of teachers.
8. The mental hygiene of industry in all forms.
9. The mental hygiene of all social groups, not only the school, but the church, educational societies, social groups and the like.

If much of all this seems a form of social service in the field of morals, that is not strange, for sound morals and mental hygiene are in large part identical. Morality is by no means indifferent to hygiene; indeed, hygiene

is the basis of a sound morality, for it assumes that health will be used for worthy ends; and without health a sane morality is hardly possible.

The social service that can be rendered in the field of mental hygiene is of two kinds, help for individuals and aid to social groups. It is not merely a matter of developing honor, loyalty, self-control, interest in work, and the democratic spirit among individuals, but also a question of mental health, sanity, and the democratic spirit in social groups. Irving Fisher recently referred to the great danger of discontent among laboring men, and he notes that some economists have come to the conclusion "that the solution of the problem of industrial discontent . . . will lie along the lines of making the workman genuinely interested in his work." Mental hygiene aims to develop wholesome interests in all such great social groups.

Mental hygiene aims to prevent feeble-mindedness by segregation and by checking the marriage of the unfit; to prevent the development of insanity where that is possible; to prevent the spread of venereal disease, the use of drugs, and, in general, the conditions that produce nervous breakdown among children, soldiers, and the general public; to provide for defective and unusual children a training that will enable them to make healthful adjustment to a conventional social environment; to give normal children a training that will insure happiness, efficiency, and mental health; to preserve the morale of all citizens and soldiers, without which in the World War victory would have been unattainable, and with which defeat was impossible; and, finally, to give the community the benefit of the truths of mental hygiene at all times.

Prevention is the special task of hygiene, both mental

and somatic, but the position of hygiene is a peculiar one. Everybody believes in hygiene, although few like to practice it. In this country we seldom do anything to prevent evil. We are expert in meeting trouble after it comes, but we do not lock the stable door until the horse is gone; and thus people think little about hygienic matters, although apt to be badly frightened when disease comes. Hence the position of the hygienist, whether somatic or mental, is not enviable. He is apt to be looked upon as a crank and a faddist. If he is successful in his work of prevention, nothing happens. The work of hygiene is never spectacular, but largely the slow process of education, and, therefore, often handicapped.

A Message for Everybody.—Mental hygiene has its significant message for every man in the most humdrum life of peace, and for every woman in the monotonous routine of her daily tasks; and in times of stress it has its solace and its aid for every soldier in the trenches, for every Red Cross nurse, for every army helper, of whatever name, of land or sea or air; for every official, whether struggling with rusty administrative machinery or with red tape, or the victim of unjust blame, or merely overburdened with the stress of normal work; and for every industrial worker, for every woman patiently planning meals for her family, for every father struggling with the burden of wages, work, and taxes and loans, for everyone, man or woman, child or adult, who conscientiously tries to do his duty; especially for every teacher, it brings help for present problems and simplification and clarification of the tasks and methods of the school. To-day sound education is the best training in mental health, and mental health is the essential condition of sound education.

The Gospel of Hygiene Based on Scientific Fact.— Such is the scope of mental hygiene. Such is its message. In a time when the danger of mental disorder is more serious, perhaps, than ever before, and the number needing the help of a sound mental hygiene greater than ever before; when we are slowly recovering from the storm and stress of war; when the hearts of men and women are still bearing heavy burdens, and the young should be trained for a task more severe perhaps than that of war; in a time of numerous fads and cults, when men cry, "Lo here, and lo there, is the kingdom of health," mental hygiene brings its quiet gospel based upon scientific fact and offers the aid of our vastly increased knowledge to those in need of sympathy and aid, a gospel as significant in peace as in war, as important for children as for adults, as helpful for normal children as for the defective.

Thus the various contributions mentioned above have placed mental hygiene and the hygiene of school instruction on a scientific foundation, and emphasized the far-reaching practical significance of these new subjects. In the present volume, however, the results of these studies only in one or two fields can be presented; but these are fundamental and give largely the natural introduction to the whole subject of mental and educational hygiene.

Problems and Questions

1. What evidence can you give that the primary aim of the kindergarten and elementary grades of school life should be health?
2. What are some of the physical and mental differences between children and adults?

3. Report an example of coördination of public-health agencies in some city or town you are acquainted with.
4. Report concrete illustrations of the actual training of children in habits of health.
5. Report some training school you are familiar with where the students receive actual training in matters of hygiene.
6. Mention, from observation, if you can, some of the advantages of a health examination at school entrance.
7. In what way did the War emphasize the importance of mental hygiene?
8. Give examples of physiological studies that have emphasized mental hygiene.
9. Report any facts from cases of mental disorder that emphasize the need of mental hygiene.
10. What other subjects have made special contribution to mental hygiene?

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CHAPTER II

THE NORMAL MIND

WHAT is the essential characteristic of the normal mind? This chapter will attempt to show that it is integration of the personality. Put in these words, this may sound very technical; but we are all familiar with the conception of mental unity, wholeness, and wholesomeness; for when a man loses his mental health we say that "he has gone to pieces"; when he loses it temporarily and recovers we say "he pulls himself together." Of one who has never had mental unity and integrity we say he is a "scatter-brained person." Let us consider in detail the evidence that integration is the essential characteristic of mental normality.

Adjustment

The common aim of education and mental hygiene is adjustment. All are familiar with the idea of development and training as adjustment. We refer to the evolution of the physical organism as adjustment. We think of normal living as adjustment to one's environment, physical and social. We conceive of education as adjustment. Thus Gregory, at a recent meeting of the British Association, referred to education as a deliberate attempt at systematic training in adjustment to one's environment.

Everybody to-day says that education means adjustment. Mental health also means adjustment; and all

the forms of mental disorder and the like are now referred to as cases of maladjustment. In all this discussion of adjustment usually there is little that is directly helpful in regard to how children may be trained to make right adjustment and to avoid wrong adjustment or maladjustment, as we call it.

How may adjustment be made? What is the mental characteristic necessary for right adjustment? In a word, what is the essential characteristic of the normal mind? If we go to the books for an answer to this question, what is mental normality, the answer the books give is again adjustment. But this answer, as we have seen, does not make very clear what we really want to know, namely, what is the essential characteristic of a mind that is normal and can make right adjustments and avoid maladjustment? Can we not get some more adequate idea of the essential characteristic of the normal mind? Let us try. Let us note first the answer of many authorities and of different sciences.

The Bases of Mental Hygiene

Mental hygiene gets the facts on which it is based chiefly from seven sources: (1) physiology and neurology; (2) psychology, normal and abnormal; (3) practical psychiatry; (4) modern sociology; (5) pedagogy and the study of children; (6) ordinary observation and folk thought; (7) biology. We may note the evidence from each.

1. *The Evidence from Physiology*

Let us recall the kind of organism that must make this adjustment to environment. We find that the human body is an army of cells, or, to use a better figure, it is a commonwealth of cells.

Modern science has shown the literal truth of the old Greek simile which likened man's body to the body politic. The human organism is a commonwealth of individuals. The number of these individuals is 5,000 times greater than the total population of the earth. According to the estimate of Donaldson,[5] the total number of cells in the entire body is 26,500,000,000,000. To quote Sherrington:[17]

> Thus the corporeal house of life is built of living stones. In that house each stone is a self-centered microcosm, individually born, breathing for itself, feeding itself, consuming its own substance in its living, renewing its substance to meet that consumption, harmonizing with its own inner life some special function for the benefit of the whole, and destined ultimately for an individual death. Day-long, night-long, in this commonwealth that constitutes each one of us, there goes forward as in the body politic the subservience of many individual purposes to one, the sacrifice of individual lives for the advantage of the many, and the birth of new units which replace the dead. . . . And each of these living commonwealths began its individual existence as a single unit, whence arose the myriads that compose its adult being. Division of labour went on and with it differentiation of structure. A plan informed the mass that otherwise were a mere congeries of cells. There come thus to coexist the lime-hardened tissues of our bones, the contractile cells of our muscles, the conductive cells of our nerves, and so forth (pp. 67-68).

Integration Is the Condition of Health.—All of these units must work together for the common good. The functions of all are integrated in a condition of health. Only in disease do some of these cells set up a warfare against the commonwealth, or form a separate revolutionary faction, as, for example, in case of cancer, where a rampant and malignant individualistic growth occurs.

It is noteworthy that this most serious of all diseases is characterized by a growth distinctly dissociated from the normal development of the organism and representing a phenomenon of disintegration. Of this Seelig says:

The growth of cancer cells is the most disorderly process conceivable. Of a sudden, and for no known reason, a certain cell makes up its cellular mind to have no regard for the laws governing the growth of the rest of its brother and sister cells. It proclaims itself an anarchist and starts in on a debauch of growth that knows no limit of size and no respect for the claims or the needs of the rest of the body. Just as the anarchist will do untold and irreparable harm to the social body, unless apprehended early, and properly dealt with, exactly so will the anarchistic cell do equal harm to the physical body, unless it and its progeny are apprehended and properly dealt with.

Functioning of the Endocrine Glands.—Still further illustration of bodily integration is furnished by the reciprocal functioning of closely related organs, especially of the endocrine glands. Although we know little about the matter, the significance of these glands in relation to personality seems apparent.

In regard to diseases of personality Bechterew sums up the results of his investigations substantially as follows:[2] it is clear, he says, that the diseases of personality, with slight exception, are somatic, at the ground of which lie disturbances of the reflex coördination of the glands and tissues of internal secretion. These disturbances lead to such a toxæmia of the organism as is characterized in the sharpest manner by a disturbance of the higher association reflexes which form in their totality the chief constituent part of the reciprocally related activity of the organism. Some data give reason to assume that even the inherited disposition which plays a rôle in diseases of personality has its cause in the in-

sufficiency or disturbed relations of the glands of internal secretion of the parents.

This integration of the physical organism is well illustrated by its relation to the poisons of pathogenic microorganisms. It reacts as a unit to repel an enemy by which it has once been attacked, as well expressed by Mott, when he says:[12]

> The vital impulse is in every part of the body, and it is certain that the more active the vital impulse in an organ or structure, the greater automatically is the supply of oxygen by the blood. Every particle of the body is as much alive as the whole and possesses a biochemical memory. In proof of this we know that immunity against disease is due to the body's having once defended itself against the toxins of a pathogenic microörganism; its tissues are thereby sensitized against this particular poison, so that should the organism again attempt to enter the body, the defensive mechanisms are immediately mobilized and the organism destroyed before it can multiply in the body.

The Acme of Integration.—The highest form of integration is found in the master tissues of the human organism, the nervous system, composed of billions of neurones. This is made up of the central nervous system and the autonomic nervous system. According to some students, notably Kempf,[10] the autonomic nervous system was the primitive original system, far older than the central nervous system, and the latter was developed after this. Possibly this may be true; but whatever the genetic sequence, to-day the evidence indicates that the central nervous system is the controlling system, and its special function is that of coördination and integration. No one has shown this so well as Sherrington, and this is the burden of his great book *The Integrative Action of the Nervous System.*[17]

The Term Integration.—Perhaps a word should be said about this term integration. The derivation of the word is familiar. An integer is a unit; we are familiar with it in the study of integral numbers. An integer has not been broken up into fractions. And again we speak of a man of integrity, that is one with no break in his character, whose reputation is unsullied. Sherrington uses this word integration instead of the usual word coördination, thus putting emphasis on the unity, the wholeness of the organism under the control of the integrative action of the nervous system. Coördination puts emphasis on the parts united, integration on the whole which results from the integration of the parts.

Integration the Function of the Nervous System.—One or two paragraphs from Sherrington's writings express the essential facts briefly and clearly.[18]

> The nervous system is that bodily system the special office of which, from its earliest appearance onward throughout evolutionary history, has been more and more to weld together the body's component parts into one consolidated mechanism reacting as a unity to the changeful world about it. More than any other system it has constructed out of a collection of organs an individual of unified act and experience. It represents the acme of accomplishment of the integration of the animal organism.
>
> The portion in this system to which mind transcendently attaches is exactly that where are carried to their highest pitch the nerve-actions which manage the individual as a whole, especially in his reactions to the external world. There, in the brain, the integrating nervous centers are themselves further compounded, inter-connected, and recombined for unitary functions (pp. 352-353).

As he points out, the animal's great integrating system is there still further integrated in the brain cortex;

"and this supreme integrator is the seat of all that is most clearly inferable as the animal's mind."

Thus integration is the essential characteristic of the normal body. The study of the nervous system suggests clearly that integration is the essential characteristic of a normal mind as well.

2. *The Evidence from Psychology*

If we turn to psychology and consider the mental processes correlated with the neural processes, we find an equally great complexity. Naturally, the mental processes may be as many and diverse as the neural. As Finzi, an Italian psychologist, has pointed out, the processes of the mental life are not static and permanent, but a series of phenomena which appear momentarily, and in an infinitely complicated causal relation, succeed each other in meteoric fashion as the manifestations of force between millions of elements, that is, the nerve cells, affected by an inconceivable number of influences of which he mentions a few, such as pulse and breathing, practice and fatigue; interest, peculiarities of attention, depth of the affective life, the infinite series of emotions; atmospheric influences, presence of other persons, period of life—such are a few of these influences; and he adds, instead of a single or a number of curves, the variations in the mental life for a single hour would look on paper like the graphic representation of all the sound vibrations of a Wagnerian overture for a hundred instruments.

In spite of all this complexity of the mental life there is, however, a unity and relative simplicity. As Finzi further points out, the reaction of the organism limits the effect of external stimuli, and the causes of the variations frequently compensate for one another so that all the waves and valleys of the curve move within

definite limits, just as the changes of external temperature can change the inner temperature of our bodies normally only within a few degrees. The regulating conditions of what may be called psychic temperature are to be found in the psychophysical fundamental peculiarities of each individual, namely in human personality.

Attention.—The most normal form of mental activity, as noted in the laboratory and by ordinary observation, is in the process of attention, in the performance of a serious task. In this process we have an integration of all the mental powers and mental processes so that Professor Royce has rightly described attention as comparable to the tropisms in animal organisms, that is, attention is a reaction of the whole organism both physical and mental, a form of mental integration *par excellence.*

Taine's Conception of the Self.—The sheet anchor of our mental life is that great complex of ideas that we call our own past, or what we mean perhaps by our own personality. No psychologist has done justice to this in brief compass so well as the French psychologist, Taine. The classic passage in which he describes the function of this cannot with justice be abbreviated. He wrote of this as follows:[21]

> Thus the thread of our events is formed in our memory; at every moment we look back on a portion; a day never passes without our having frequently reverted back, and sometimes far back in the chain, sometimes, by means of abbreviatory processes, to events separated from the present moment by many months and many years. Associations so repeated are continually becoming more tenacious; our past is a line which we never weary of tracing over and refreshing with ink.—Classes become established among these events; they group themselves spontaneously according to their resemblances and differences; the most frequent, the acts of walking, grasping with the hand, lifting a weight, feeling, touching, smelling,

tasting, seeing, hearing, recollecting, foreseeing, willing, are collected each under a name; we conceive them as possible to us, and these possibilities, incessantly verified and limited by experience, constitute our powers or faculties. There is no one of them whose presence, range, and limits may not at any hour be manifested to us, so that our idea is associated with the idea of self by links which are hourly reforged and strengthened. Add to the recollection of my events and to the idea of my powers a last idea similarly renewed and strengthened at every moment by experience, that of the body which I call mine, and which is distinguished by sharply divided characteristics from all others, being the only one which answers to my touch by a sensation of contact, the only one whose changes excite sensations in me without an intermediate, the only one in which my will is capable of exciting changes without an intermediate, the only one in which the sensations I ascribe to myself appear to be situated. All this group of true ideas and exact recollections form a singularly solid network. It requires, then, a great accumulation of forces to tear from it any portion really belonging to it, or to insert in it any portion extrinsic to it.—In fact, these transpositions are rare; they are principally met with when an organic change like sleep or hypnotism loosens the meshes of the network, when an inveterate, predominant passion, fortified by psychical or sensorial hallucination, at last wears away some thread of the tissue, substitutes another thread, and, gaining step by step, sets a fictitious web in the place of the natural web. But, as woven under ordinary conditions, the web is good, and its threads correspond, by their presence, by their diversities, by their apparent dates, by their connections, to the presence, the diversities, the real dates, the connections of the real facts; this is because the real facts themselves have woven it. The mind resembles a loom; every event is an impulse which sets it in action, and the fabric which issues from it, transcribes by its structure the order and kind of the impulses which the machine has received (p. 123).

The Self the Citadel of Health.—The process of education for all of us is first to build up this self and to

acquire experiences that will serve as corrections in new situations; and as shown by innumerable pathological and semi-pathological cases, whenever there is dissociation to such an extent that the present experience lacks correction from the association complexes of the past experience, any kind of erratic thinking and behavior is liable to occur.

We realize instinctively that our self-hood, our personality, is the citadel of health and sanity. We feel bound to protect our own personality at all hazards and we resent above all else anything which tends to disintegrate this.

Forms of Disintegration.—If we turn to abnormal psychology, there is a great literature on mental conflicts, on unwholesome mental complexes, repressed ideas, repressed feelings, psychic lesions and the like. All these are illustrations of various forms and conditions of disintegration of the personality, and indirectly illustrate the need of that unity and coördination of the mental and physical abilities that we have called integration. Of such pathological conditions of dissociation and the various forms of maladjustment, this is not the place to speak in detail, but the literature is easily accessible. For many of the less technical examples, one may consult *Mental Hygiene,* the journal of the National Committee for Mental Hygiene and the literature referred to in its pages; and Wells has given illustrations in his book *Mental Adjustments.* His classification of the various forms of dissociation may be given here. He says:[26]

We have quoted a possible example of the first kind, in a breakdown of the digestive system. Here a process is dissociated not only from the personal consciousness (as it is normally), but also from the main tendency to survival. We

shall meet a few other examples. In such cases, the distinguishing feature is the dissociation of some involuntary or unconscious function of the organism. Second, the ability to move one side of the body, or the lower half of the body, or to make the movements of speaking, may be lost. It is like a paralysis of the muscles that make these movements. Certain movements of these muscles are lost to the control of the main personality. They are dissociated from it. Third, a patient whose retina is unaffected may be unable to see objects outside the direct line of vision. Though his skin is healthy, he may be unable to feel a touch at some special spot. When this happens, it is a form of sensation, instead of a movement, that is dissociated from the main personality. Fourth, *ideas* may manifest themselves in a great variety of ways, without the main personality's being aware of the ideas. Prince's patient of the bell-towers gave a fair example of this, when her hand wrote automatically something not in the awareness of the then dominating personality. Fifth, the main personality may lose control of the organism, which is then dominated by a system of ideas split off from it. (Somnambulisms, fugues, multiple personality). Sixth, the main personality may be aware of the occurrence of a mental process, but not recognize the existence of the process as a part of the main personality. (Externalization, projection.) For example, a patient complains that the "voices" hurl insults at him. Of course, the voices come from nobody but himself; but he does not recognize the voices as coming from himself (pp. 156-157).

Besides these pathological forms of disintegration, many minor forms appear in normal individuals. The pathological merely show in large letters what occurs in greater or less degree in everybody under certain conditions. Among the more important of these conditions are emotion and passion, especially fear and worry, extreme fatigue, the effects of drugs, indigestion, bad diet and the like, and, besides all these, a vast number of minor distractions that have a strangely serious effect in disturbing us quite out of proportion to their real

importance. Such are all the little difficulties and annoyances that beset everybody, like those referred to by the cartoonist Briggs as having such an effect that "the day is utterly ruined."

Most serious are the distractions of uncontrolled emotions and passion, the survivals of childish attitudes of selfishness, envy, fear, and such bosom serpents as jealousy and the like, and a multitude of inhibitions, unfortunate conditioned reflexes, habits, etc. All these are disintegrating to the personality.

The Normal Mind.—The evidence from psychology, normal and abnormal, points to integration as the essential characteristic of the normal mind. We may then probably describe the normal mind as one in which the manifold impulses and mental processes are integrated for general purposive activity. Here again we can back up the evidence by the testimony of Sherrington:[18]

> The normal action of the mind is to make up from its components one unified personality. When we remember the manifold complexity of composition of the human individual, can we observe a greater example of solidarity of working of an organism than that presented by the human individual, intent and concentrated, as the phrase goes, upon some higher act of strenuous will? Physiologically the supreme development of the brain, psychologically the mental powers attaching thereto, seem to represent from the biological standpoint the very culmination of the integration of the animal organism (p. 353).

3. *The Evidence from Psychiatry*

If we turn to practical psychiatry we find that most, if not all, cases of mental disorder are characterized by disintegration of the personality. The whole Freudian literature is full of illustrations of dissociation. repressed

memories, and affects, and all those skeletons in the mental closet whose disintegrating influence has made them characterized as psychic lesions. On the other hand, psychoanalysis brings about its cures by bringing the repressed associations and feelings into consciousness and by inhibiting their distracting influence by normal fusion with the stream of thought.

An Example of Dissociation.—The literature of psychiatry is largely made up of the report of cases of disintegration of the personality. Often the patient is unconscious of this conflict and confusion of his mental processes, sometimes conscious of the disintegration. The following case of the latter class reported by Wells shows in large letters what not infrequently happens in less degree in people who are considered normal: [25]

My mind seems to be in layers like strata in geology. . . . Something seems to push my mind into channels I don't want it to be in. . . . I don't know why I think of these things. I seem to be bound to find out a lot of things I am not interested in, as if some one was teasing me. It makes me feel frightened, as if I was changing to something else. It is like the difference between a good and a bad person. All at once I seem to wish somebody would die. I don't mean it, of course, but I can't keep it down. . . . If I could gather up a good will it would be all right. Instead, these vague ideas seem to be wandering all around as if you were going through a sort of labyrinth. . . . I can't say anything I want to. It is like going through a river where there are a lot of weeds and they get in your way and you can't get through. . . . I seem to be imagining a lot of things. I can't get my mind together. . . . I seem all of a sudden to sink right down into deep thoughts as though I were covered up in a snow-bank. Whether it is a loss of the train of thought or of the spirit I don't know—it seemed as if my mind had been crushed back and I had lost control.

In a great number of cases of mental disorder, as we have noted, the best form of cure is reëducation, and this consists in an attempt to develop concentration of attention, orderly association, and wholesome interests in a word, an attempt at developing a wholeness and integration of the personality to take the place of confusion, distraction, interference of association and the like.

4. *The Evidence from Sociology*

If we turn to modern sociology we find that the permanent existence of a social group depends on community of interests, especially on the integration of the individuals of the group in doing some significant group task. For example, as Simmel has pointed out, one of the most potent factors in insuring the life of a group is the existence of a common enemy, because this solidifies and integrates the group.[9]

The highest example of a normal social group is one in which the superior abilities of the different individuals of the group are integrated for a common purpose and the highest kind of group leader is not one who dominates the group, forcing his own views upon the individuals, but one who integrates the abilities of the different members.

5. *The Evidence from the Study of Children*

Pedagogy and the study of children teach us that normal children are those who can give close attention, those that can choose their own tasks and work attentively in performing them; and, on the other hand, we find that the one most serious fault in a pupil is lack of attention, lack of concentration.

This means lack of integration. Many years ago Dr.

Triplett [28] made a study in which he asked a large number of teachers to report the most common faults among their pupils. The one outstanding fault mentioned by nearly all the teachers was lack of attention.

A certain lack of integration, it is true, is characteristic of the child mind. A considerable amount of conflict and confusion is common. Especially is this true because the child is largely dominated by native impulses. Control of emotion has not yet been attained and the higher integration of the personality found in the normal adult who has been properly trained is, of course, lacking. On the other hand, however, the lack of integration in the normal child is largely a lack of continuity and permanence in the mental impulses and sets of the mind. The mood and the behavior are now this, now that, constantly changing, and few mental attitudes are permanent, but for any given situation the integration in the mind of the normal child is often probably distinctly superior to that in most adults. The child suffers no distraction. His whole psychophysic being reacts to the present situation. For the moment he shows complete concentration of attention; and in children, as in animals, the better the attention of the child the more promising is he as a subject for training. Thus while the power of integration is undeveloped in children and the higher integration lacking, both in children and in adults alike integration of the personality is the essential characteristic of normality.

6. *The Evidence from Everyday Observation*

The ordinary observation of everyday life and the folk wisdom of countless generations give significant evidence. Our ordinary words to express mental unity and a normal condition of harmony are poise, self-con-

trol, self-possession, and the like. None of them are adequate. The word serenity in its original meaning referred in large degree to this wholeness and unity of the personality, but this, too, is not adequate. The Platonic conception of harmony of the mental faculties and mental unity and wholeness represented this characteristic of mental wholesomeness, but the technical word integration seems to be the best term to use in mental hygiene.

The words and phrases referred to above, used in our daily conversation to characterize the lack of poise and integration of the personality, give striking expression of the common idea that unity of the personality is the condition of health. We refer to the lack of integration as going to pieces, being rattled, going up in the air, and of a man who has suffered a nervous collapse, we say he is all broken up or he has gone to pieces. When a man has lost or never had this integrative ability, we are apt to say he is not all there. When a man suffers temporarily from this disintegration of personality and then recovers, we say that he pulls himself together.

The evidence from folk thought, as shown in maxims, proverbs, and the great moral codes, is similar. For example, the old Romans believed that if a general, when leaving his home to enter a campaign, stumbled on the threshold of his house, it was a bad omen. True enough, says Freud, for the stumbling was evidence that the man's mind was not clear and united for the purpose in hand, but some hesitancy and doubt prevailed.

Again, as an example from the moral codes it is noteworthy that the Ten Commandments forbid envy, covetousness, and the most seriously disintegrating mental attitudes; and Jesus sums up the whole Decalogue in a positive command for integration of all the mental

powers: "Thou shalt love the Lord thy God with all thy heart and with all thy soul and with all thy mind and with all thy strength"; and "Thou shalt love thy neighbor as thyself."

Defense Mechanisms.—Another significant piece of evidence from everyday observation is that furnished by the efforts, often pathetic, that we make to defend and protect our own personality. To this end we resent the mention of our faults and weaknesses even by our best friends. Most of us are strangely sensitive to anything that remotely suggests blame or criticism; we shirk responsibility lest blame should result; and if, as often happens, we develop a sense of inferiority in regard to certain things, we overcompensate and become pedantic in the thoroughness of our performance or perhaps obstinate in our behavior. Especially it is the blow at the integrity of the personality that makes the tragedy of failure to be understood and of unjust punishment or blame both in children and adults.

It is to protect the personality that we fool ourselves with excuses for our neglect of personal and civic duty, that we repress the memory of opportunities neglected and of failure in performance. For this the slacker and the neurotic become so clever in inventing disorders and extenuating circumstances. For this the discredited politician makes his pathetic efforts to come back. For this the crook sets a limit to the kind of crimes he will commit and retains some scrap of honor to float on the citadel of his personality. For this all of us resent any criticism of our real weaknesses and defects.

A Concrete Example.—Only a single case can be cited, this pathological, perhaps, but it shows in extreme form the sensitiveness that everyone feels in regard to what

seems to threaten the individual's own individuality and personality, although most people are not sensitive to such little things.

The Case of Mr. Blake.—I know no better illustration than that of Harrison Gray Otis Blake, the editor of Thoreau's writings. E. Harlowe Russell, who knew Blake most intimately, gave me permission to quote from an unpublished address in which he paid tribute to the beauty of Blake's character, and described in some detail his characteristic of extreme conscientiousness, in part as follows:

I never knew a person who avoided with such care every approach to duplicity, prevarication, or inaccuracy of statement, who came so near telling on all occasions "the truth, the whole truth, and nothing but the truth." An oath administered to him would have been not merely superfluous but an impertinence. Indeed, the form required of witnesses in court might with propriety have been revised, so as to read, "you solemnly swear that your testimony in this case shall be like that of Harry Blake with reference to the most trivial circumstance of everyday life."

The attainment of perfect peace of mind was, with Blake, the absorbing passion of life.

At times there was a suggestion almost of insanity in the excess of this craving for serenity, of which he himself was painfully aware, but he knew not how to moderate or control it. Whatever vitiated or obscured in the slightest degree this beatitude of spirit, which he was wont to call "the vision of God," was to his whole nature intolerable. It was in order to reach and dwell in this frame of mind that he bent all outward circumstances and conditions and strove to purge his conduct and his inmost thoughts of every disquieting motion and tendency. This was the salvation of his soul; he spoke of it as "eternal life"; and there was nothing he would not

freely give in exchange for it. What aggravated the difficulty of attaining this condition was a lack of the sense of proportion, in consequence of which very small obstructions often appeared formidable to his microscopic apprehension. To reach a conclusion with reference to the most trifling affairs was always a slow, and sometimes a painful process, because he had to weigh alternatives *separately* and could not put one thing against another and so dispose of both by a process of cancellation. In figuring, he carried his decimals to three places, and seemed always to want to carry them further. Moreover, he had not the power when he made a decision, to put it under his feet and stand upon it; he *had* to take it up again and again and reëxamine it.

No reading, no society, no work, however worthy, was satisfying to his nature if it failed to put him in a serene and luxurious frame of mind. This was the test which he applied to every influence from without and every activity from within —to literature, art, companionship, occupation, revery, everything.

Blake could not be depended upon to do anything at a definite date. If serene, he would lecture to the Concord Transcendentalists; if not, he must first of all attend to his soul. And his finger was always, as we may say, on his mental and moral pulse.

Such cases are especially instructive; for the experiences always have an affective character. No matter how trivial or banal the issue, as soon as it gets to be a matter of conscience it is significant, for it is a matter of feeling, and threatens disintegration of the personality.

7. *The Evidence from Biology*

Thus the evidence from everyday observation and from the sciences on which mental hygiene is based, points to integration as the essential characteristic of the normal mind. If it were necessary, other evidence could be

cited. The evidence from the biological study of organisms Paton sums up as follows: [14]

The physicist tells us that "an organism is a system that perpetuates itself by autocatalysis and reacts according to the theorem of Le Chatelier." The chief tendency of this organism or system "is to preserve," not as Oswald said, its "physiological invariability," but its physiological integrity. This it does at all costs. Sometimes the return to a physiological balance is accomplished by a simple reflex, at other times affective tendencies subjectively expressed as "desires," "appetites" and various kinds of emotional and mental "needs" direct the stream of energy let loose in the effort to restore an equilibrium. The feelings of hunger, thirst, the desire to preserve life, to mingle with the herd, all persist until a certain degree of the physiological integrity has been restored. By hook or by crook the organism when stimulated or disturbed strives to take up a new position, not a state, in reference to internal and external conditions. In other words, new adaptations are formed. If these affective tendencies are not satisfied, Nature makes use of sudden and violent means of securing adjustment by letting loose accumulated energies in the shape of emotions to accomplish the purpose. An emotion is a sudden and often violent attempt to restore physiological integrity. Complicated and numerous as these affective tendencies may appear to be, they are the expression of the fundamental biologic unity of the organization which tends either to maintain the balance when once established or to restore it when disturbed (p. 415).

Personality and the Normal Mind

The Different Selves

It has been a favorite problem for thinkers to analyze human character into the different selves that are apt to be developed. From our present point of view we may analyze the selves roughly for normal adult life as follows:

1. *The Child Self.*—First is a survival of the child self. In many, probably in all of us, as Freud maintains, certain characteristics of childhood survive. In certain situations, in regard to some things, certain tendencies of childhood are released—emotional reactions, ways of thinking, attitudes of childhood, appear. These may be controlled, repressed by the other selves, or may become dominant. In times of illness or great emotion, or even in periods of great relaxation or the like, one may drop back into these child reactions. And in many, perhaps in all of us, at times childish attitudes of envy, jealousy, credulity and the like, are liable to revive. As regards certain impulses, like Bostock's wild animals, we are trained but never tamed.

2. *The Social Self.*—Second is the domestic and social self. Of course, this might be divided into many more concrete selves according to the different social groups of which one is a member; nevertheless there is, we may say, a general social self made up largely of the influences upon one's character by the different social groups in which one is educated, especially the family and the larger groups in which one is most active.

3. *The Educated Self.*—Third is the self which results from one's education in the broadest sense of the word as well as the specific education which one has from earliest childhood. This is not merely the pedagogical self, as some might call it, but rather the self as determined by one's total education.

4. *The Business or Professional Self.*—A fourth self is that developed by one's task, one's work, one's profession. One's occupation, one's business, brings about a complex of associations and attitudes most intimate and vital; and this specially industrial or professional self is likely to be a pretty definite as well as signifi-

cant development. Usually it lies at the heart of one's adult personality.

5. *The Conventional Self.*—Fifth is the conventional and traditional self which persists in everybody perhaps to a far greater degree than is likely to be recognized. This self represents the outcome of all the conventions and customs of the social groups of which one has been a member, and in case of most people it dominates the greater part of their activity.

6. *Our Reputation Complex as Self.*—Sixth is the complex of ideas that represents our own conception of what the world thinks of us. This is so deep-seated and so potent that it should be numbered with the other selves. Little by little from early childhood this complex develops. It is the outcome of daily reactions in the social groups of which we are members, of the treatment we have received from others; of all the words of praise and blame, of the smiles and helps and gifts received; of the rebuffs and checks and punishments and thwarting of our plans; of all our personal and social successes, and all our failures, or rather of our idea of what the different social groups of which we are members think of these successes and failures.

This reputation complex becomes such a vital part of the ego that we are exceedingly sensitive about it. If it is threatened, our very selfhood seems threatened. If in some degree it is disintegrated, our personality itself seems disintegrated. If, on the other hand, the idea of our own reputation is enhanced, whether by praise of others or in spite of the lack of it, whether the result of strong evidence or in spite of the lack of it, it has a powerful influence upon us. We are apt, in either case, to attempt to live up to this reputation as we see it. If, on the other hand, our idea of this rep-

utation is diminished, whether by good evidence or by our own imagination, the result is apt to be a sense of social inferiority or of antagonism, which again affect behavior and the mental health.

Of course, this complex in regard to our own reputation is variable and often the result of our own moods and feelings, and whatever physical conditions in the way of digestion, sleep, secretion of endocrine glands and what not, lie back of these as well as of the real evidence we get from those about us. We know that our actual reputation is often not justified by our real character and performance, and we believe at least that often it is unjustly shady. In regard to those points where our good reputation is unwarranted we are seldom troubled. If we reflect upon the matter at all, we are apt to conclude that the unduly exalted opinion our friends have of our good qualities is offset by the unjust prejudices our companions often have about other points in our character and behavior.

How powerful this self is, thousands of experiences show. We see its influence in large letters in those cases where this idea of our own reputation is one of inferiority or of conceit. Whatever threatens this is the stimulus to jealousy, with all its bosom-serpent disintegrations of the personality. Our extreme sensitiveness in regard to this reputation complex makes it a significant factor, not only in regard to behavior, but especially in regard to one's sense of well-being and one's mental health.

7. *The Total Self.*—Seventh, besides all these, there seems to be clearly a deeper self made up of innate characteristics, deep-seated emotional impulses, ideals, beliefs, knowledge, generic attitudes, determining tendencies—the outcome of one's own total past, inherited

and acquired, a self resulting from one's central interest in life and one's special ambitions and ideals. As regards the quality of this self, there are the widest individual variations, all the way from that of one whose central interest is his own ego and personal individual acquisitions, up to the martyr, the hero, the public servant in the highest sense, whether in industry, politics, or science. In case of many individuals at least, this self is the dominant one, tending to integrate all of the others.

The Relation of the Selves.—In some such way we may roughly distinguish the different selves likely to be developed and to play the chief rôle in the case of an individual. Of course, the different selves overlap and are interrelated. In the case of some individuals they are all coördinated into a single integral personality. In the case of others they may be largely uncoördinated or even dissociated; and, of course, in extreme cases, especially in pathological cases, these different selves may themselves be split up into different complexes representing still other more or less disparate selves.

In different individuals the different selves are found in different stages of development, and the relation between the selves and the degree of integration of them differ greatly. In all cases there is likely to be a great difference between them. The business or professional self, for example, is often very different from the domestic self; the one may be hard, close-fisted, narrow, pedantic, sensorious; the other kindly, sympathetic, open-minded. Altogether there is likely to be more or less conflict among them. In the normal mind all these are integrated in one personality.

The Conflict of the Selves.—Failure to integrate these different selves properly may be the source of serious

mental conflicts. The significance of this is not generally realized. A man, for example, finds his conventional self out of harmony with his deeper rational selfhood. The eternal conflict between nature and reason on the one hand and convention on the other, is waged in his own bosom. The result is disastrous. Or, if one's domestic self is in conflict with one's business or professional self, continued mental conflict is likely to be the result. Most serious of all in many persons is the survival of the child self with its jealousies, fears, and deep-seated aversions in conflict with one's acquired character and total adult selfhood. With this all other selves, those developed by education, by convention, by one's profession, and the rest, are liable to be in conflict, especially at certain times. The result may be the blinding of judgment, the inhibiting of conventional training, the paralysis of reason itself. Not infrequently the greatest minds are the victims of this child self, as revealed by their emotional reactions and inability to correct their judgment by the facts of experience, and, in any case, the mental conflict is likely to be disastrous to mental serenity and health.

Social Misunderstandings.—Equally serious, perhaps, may be the confusion that arises when the social groups of which we are members misunderstand and misinterpret the action of an individual by attributing to one's general character and personality what is the result of one of these special selves. In most men, especially in those where the different selves are not integrated, the line of division between them is confused and blurred. Many acts of the individual are conditioned by motives that are on the borderline between different selves.

Thus the difference between one's business self and

one's social self is not clear-cut. The business self should be efficient, concentrated in its functioning, specialized in its activity, deaf to distractions; the social self, on the other hand, should be free and generous, patient of interruptions, open-minded, always considerate of the wishes of others.

Thus, if certain situations are interpreted by a man as matters of business and interpreted by his friends as social matters, even the generous man may appear selfish and the courteous may seem dogmatic and obstinate; whereas if the conditions were reversed and the man's friends interpreted the same situation as a business matter and the man himself regarded it as a social matter, he would be condemned for the same act, as being inefficient, too ready to yield to others, lax and inattentive in business.

The self psychology, represented so brilliantly by Miss Calkins, has at its heart, as I understand it, this conception of the normal mind, for she defines it as: "A psychology which studies the totally integrated individual in the attitudes with which it confronts its environment."

The Study of Personality

The different kinds and types of personality are subjects for laboratory investigation and researches in social psychology. These are concerned with studies of intelligence by observation and the various intelligence tests and the behavior of the individual, one's instinctive and emotional equipment, one's attitudes, interests and habits, one's social adaptability, one's prejudices and peculiarities, one's general behavior and methods of work, one's mental defects and disorders, and especially with one's physiological, psychological, social, moral, and

pedagogical ages, as well as with one's individuality and special abilities and peculiarities. Watson has made suggestions for such study,[24] and Folsom[7] and others have begun such research, but relatively little has already been done. All such investigations will make important contributions to mental hygiene, but the especially important things for the mental health may be outlined without waiting for the results of extended investigation.

As Freud has written the psychopathology of everyday life, so some one should write the evidence from everyday observation in regard to what constitute the characteristics of the normal mind. The data we have at present point to integration as the essential characteristic.

It seems doubtful whether any pathological cases could be found where there is not disintegration of the personality. Pfister notes that in all his experience he has never found cases of the anxiety neuroses without the centers of personality being affected, and it is doubtful if cases of other psychoneuroses can be found without disintegration of the personality. In all the different forms of abnormal personality described by Rosanoff disintegration seems to be present, although he considers them quantitative variations from the normal.[16]

Normality as a Functional Concept

While the evidence is conclusive that integration of the personality is the essential characteristic of the normal mind, and the aim of training in childhood should be to develop this, still one may naturally say that this is a council of perfection, that every one is subject to distractions, every one is lacking in the necessary integration of the personality, and that there are all degrees

of this essential characteristic; so that the practical question still remains what constitutes the normal mind, what is the standard of normality for the practical problems of daily life in society?

The answer to this is that the practical test of normality is that stage of integration that enables one to work, and earn one's own living, and get on peaceably with others.

Roughly, normality is a functional rather than a structural conception. We get the best idea of this from considering the physical organs. A normal eye, for example, is not an eye free from defects but an eye that under ordinary conditions can function normally. Practically all eyes, as shown by investigation, have, for example, errors of refraction, usually at least some degree of astigmatism. In most cases, however, the astigmatism is slight, the eye can make its own correction for this defect, and clear vision is possible without strain. All such eyes are functionally normal, and we shall not be far wrong in defining a normal eye as an eye that can make correction for its own defects and perform its function in ordinary conditions without strain. The limits of normal variation in the condition of refraction, for example, would be the limits within which variation from perfect structure is possible without interfering with functional ability.

So with the other physical organs and so, too, with the mind itself. The normal mind is not one that is perfectly integrated and free from defects, arrests of development, or even from attitudes and habits of thought similar to those characteristic of pathological conditions, but rather it is a mind that can compensate for its defects and weaknesses, that can correct its own errors and is able to control its pathological tendencies,

or, in a single word, a mind that under ordinary conditions can function normally.

The Practical Conception.—That this conception of normality is the only tenable one, seems to have been demonstrated in the war by the fact that every one, even with the strongest nerves, was found likely to break down when subjected to sufficient strain.

Thus, from the practical point of view, the normal mind has such a degree of integration that it can adjust to the ordinary situations of life, perform some significant task in society, and get on peaceably in the social groups of which one is a member.

Inhibitions.—In case of the normal individual there may be many resistances, as Freud calls them, or inhibitions as they might be called from the point of view of ordinary psychology, many conflicts and forms of interference of association, many habit distortions, as Watson calls them, and, in general, many forms of temporary and partial disintegration. In children and youth these may be looked upon as psychoses of development, temporary disorders that will be outgrown with proper training and a healthful environment. Says Mursell: [18]

> These complications—repressions and releases—may, however, be formulated in terms of well-known and tried psychological categories. Furthermore, all behavior does not exhibit them, and in themselves they do not constitute the essence of psychopathy. They are present in the life of every human being; for the development of personality is a rough job and repressions and distortions are bound to be left over. But so long as the individual is equal to environmental demands and able to live substantially up to the social norms, the mere presence of certain mechanisms does not make him a psychopath.

For mental hygiene it is not necessary to analyze the various forms of disintegration of the personality. For prevention it is desirable to have a clear idea of a few simple conceptions and general principles. The view of normality as essentially integration does not exclude the possibility of conflicts, repressed feelings, inhibitions, and confusion of ideas and the like. As Freud long ago pointed out, a normal person can carry a large number of repressions or, as he calls them, affects that have not been reacted to, without serious disturbance, and everybody suffers from various inhibitions and the like. As Mursell has expressed it, "repression is a function of the integration of a developing personality."

The Task.—Thus integration of the personality may be taken as the essential characteristic of the normal mind at whatever level of intelligence. In case of those of less intelligence, even of the feeble-minded, the best possible integration of the personality at the given level is desirable; and at the highest levels it is equally important. In case of those with disintegrated and disordered personality it is necessary that the integrity of the personality be restored by proper training. To the question of how integration of the personality can be developed the answer is, by coördinated activity, physical and mental, in the doing of significant tasks. The concrete application of this principle will be considered later in connection with the work of the school.

Attention and Association.—It is not yet possible for hygiene to know accurately the mechanism by which this integration is brought about. Its manifestation is best seen in two mental processes—those of concentrated attention and orderly association.

As regards attention, every psychiatrist recognizes

that the power of concentrating attention is essentially normal and that inability to give attention is the usual characteristic of mental defect; and, as already noted, and as recognized by every one, the power to attend without distraction and the habit of attention to the present situation, are essential to the mental health as well as to efficiency in mental work. Upon all this it is not necessary to dwell. The other mental function, that of association, is essential for normality. This we must consider in detail.

Summary

1. The evidence indicates that the essential characteristic of the normal mind is integration.

2. The essential characteristic of the physical organism is the integration that makes it a commonwealth of cells.

3. The highest form of physical integration is that shown in the integrative action of the nervous system.

4. Although the mental life is very complex, it shows a high form of integration in the process of attention.

5. The individual self is the citadel of the integrated personality.

6. The various mental disorders, mental conflicts, repressed ideas and feelings, dissociations, and the like, are so many illustrations of various forms and conditions of disintegration of the personality.

7. The cure of mental disorder by reëducation consists in developing concentration of attention, orderly association, and a wholeness and integration of the personality.

8. The highest form of a normal social group is one in which the superior abilities of the individuals of the group are integrated for a common purpose.

9. Pedagogy and the study of children show that normal children give attention and show a large degree of integration of the personality but that the most common fault of children is lack of attention.

10. The evidence from observation and folk thought indicates that mental unity or wholeness is the characteristic of normal individuals.

11. The evidence from biology and the other sciences also points to integration as the characteristic of normality.

12. Normality is a functional rather than a structural conception, and the practical test is that degree of integration that enables one to work at a significant task and get on peaceably in the social groups of which one is a member.

13. In the normal mind the different selves are integrated and capable of coördinated action.

14. The best means of developing integration of the personality is coördinated activity, physical and mental, in the doing of significant tasks.

15. Thus mental hygiene agrees with Sherrington that "the normal action of the mind is to make up from its components one unified personality." This is, however, no mechanical combination of parts, but rather an integration of special abilities in coöperative function.

Problems and Questions

1. In your educational reading how often have you found the aim of education described as adjustment?
2. What evidence do you find from your own observation that integration of the personality is the characteristic of normality?
3. Give further evidence that integration is the characteristic of normality from your psychological reading.

4. Give further evidence from pathological cases for this conception of normality.
5. Give further evidence from the study and observation of children that integration is the characteristic of normality.
6. Report from your general reading of literature and your knowledge of folk ways any illustrations of this view of normality.
7. In your own thinking and observation would you distinguish other selves besides those described in the text?
8. Report any illustrations of conflict of the different selves that you have observed in yourself or in others.
9. Give examples, if you can, of the practical functional conception of normality described in the text.

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CHAPTER III

THE CONDITIONED REFLEX

THE special function of the mind that makes integration possible is association, referred to long ago by Zanotti [2] * as comparable to the law of gravitation in the physical world.

"The phenomenon of association appears almost at the very outset of experience. The primitive shocks or tremors coalesce and form definite sensations which are the first actual experiences of the conscious individual. Sensations, in turn, combine into simultaneous groups (percepts) and into sequences. The resulting groups combine into higher complexes and trains of thought. Thus the associative process runs through the whole gamut of mentality."

This statement by Warren[67] in his excellent history of the theories and facts in regard to association shows the fundamental character of this process in the mental life.

For special study we may take the simplest form of association—the association of stimuli.

The Studies of Pavlov

The laws of the association of ideas have long been known; but only recently was it discovered that when

* References throughout this chapter are to the bibliography at the end of Chapter VI on page 165.

stimuli of disparate character—for example, sensations of taste and sound—occur simultaneously, they, too, may become associated, and the association be so intimate that the associated stimulus produces the same response as the original stimulus. This was a great discovery. The method based on this promises scientific results in many baffling problems. The discovery was made by Russian investigators, the chief of whom is Pavlov.[2 54 55]

For the purpose of his investigation Pavlov chose what seems one of the less significant organs of the body, namely, the parotid or salivary gland. The reason for this is obvious, for this stands in complex relations with the external world and with the muscular system, but its rôle and its relation to the organism are more simple than those of the other glands. Also it is possible to study this gland without injuring the animal.

This great physiologist studied the secretion of the salivary gland in the dog as affected by different stimuli, and developed a most elaborate technique for this purpose; but the results may be described in very simple language. We may take the classic example, a story often told, but still as wonderful as ever.

The Conditioned Reflex.—If you give your dog a piece of meat, a secretion of saliva occurs. The stimulus of the taste or odor of the meat is followed by the secretion of saliva as a response. This is an ordinary medulla reflex. If, every time you give your dog a piece of meat, you ring a bell, after a while you can ring the bell without giving the meat, and, nevertheless, there will be a flow of saliva. The sound of the bell has become associated with the stimulus of the meat and produces the same physiological reaction of the gland.

Again if we place before the dog's nose a glass with very weak sulphuric acid, he does not react at all. But if we spray the acid solution into the dog's mouth, after a short latent period a violent secretion of saliva occurs. After a time, if we merely show the dog the glass filled with the sulphuric acid, then the saliva begins to flow. In this case the sight of the glass has become associated with the stimulus of the acid and produces the same response. Such an associated stimulus is called a conditioned, or associated, stimulus, and the reaction produced, a conditioned reflex. In this case, according to Pavlov, the association is functioned by the brain cortex.

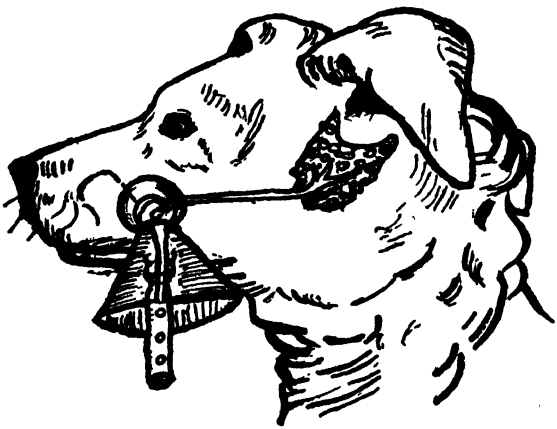
Response to an Indifferent Stimulus.—We are familiar with the doctrine that a definite stimulus produces a definite response, that a group of stimuli, a situation, produces a definite response. We are familiar, too, with the doctrine that a normal organism is made up of tendencies to react, certain definite tendencies fitting definite situations like keys fitting locks. But in the conditioned reflex we have an indifferent, an arbitrary, if you please an unnatural stimulus, associated with the natural stimulus and bringing about the same result. The response remains the same. The stimuli change.

Pavlov and his students have shown that every impression from the external world for which an animal has perceiving organs, such as a tone, whistling, noise, cold, heat, mechanical stimulation of the skin, movement, and so on, is capable of association to produce a conditioned reflex.

Pavlov's Method.—Some account of his method is necessary to show the significance of Pavlov's results.

Pavlov, in his investigations, very carefully controlled the conditions. By making a fistula in a dog's cheek

a tube can be inserted into the opening of the parotid gland and the exact amount and the quality of the saliva secreted can be measured. Obviously, many sources of error would naturally occur. The situation, or the group of stimuli affecting the animal, is constantly changing. Even the ordinary methods of the



APPARATUS FOR MEASURING SALIVA SECRETION

experimenter have their influence. Consequently, the greatest care is necessary to control conditions. Precisely this was attempted by Pavlov. His careful technique can hardly be appreciated without a look at his laboratory. This has been described by two students of the conditioned reflex as follows:[1 50]

The construction of the laboratory is such that no vibrations of any kind can affect it. The animals, during the experiment, are placed in separate compartments enclosed by walls composed of several layers which make them absolutely vibration-proof and sound-proof. The experimenter is invariably outside the compartment, and the entire experiment is conducted by automatic arrangements. The stimuli are produced from

the outside and the food is also dropped into a dish in front of the animal from a suspended box which opens and closes by a compressed air apparatus operated by the experimenter.

The room itself is divided into an inner and outer part. The investigator works in the outer part of the room where a whole battery of rubber balls connects him through numerous mercurial electrical contacts with the inner part of the room. Compression of one or another of the balls causes a stimulus in the inner part of the room where the animal is placed. The inner part of the room is separated from the outer one by a ceiling and by walls over two feet thick. The walls and the ceiling are made of compressed turf and a double massive door closes on pressure. Repeated experiments proved that the very loudest conversation alone penetrated from the outer to the inner room, and then only as a subdued murmur. Street noises and vibrations were absolutely inaudible, likewise all noises associated with the work in the outer part of the experimenting room. The inner part, intended for the animal, is windowless and illuminated by electric light. A periscope is inlaid in the wall in order to see the dog and the inner part of the room during experiments. In the middle of the inner room is a table on which the dog is placed. The animal is secured by its collar to a transom beam above the table and its paws fixed in string loops. (As a rule the dogs become so accustomed to this procedure, that they run as quickly as possible, and of their own accord, into the inner room, jump unaided onto the table and lift each paw in turn to be placed in the string loop.)

With this objective method and extreme care to control conditions, Pavlov and his students have been able to distinguish different kinds of conditioned reflexes and the conditions of their development.

Repetition Necessary.—In order that an association may be formed between any indifferent stimulus and the original stimulus of any organ, for example, in case of the salivary glands, it is necessary that the indifferent stimulus shall occur a certain number of times with the

original stimulus; but the conditioned reflex thus formed may at any time be destroyed as soon as the repeated connection between the original stimulus and the conditioning stimulus ceases, or it may be modified by changing conditions in the environment. The fundamental characteristic of the temporal association appears to be, therefore, its extraordinary instability; the temporal connection is in an eternal flux, now increasing, now becoming weaker, or wholly disappearing. In order to make conditioned reflexes permanent it is necessary that the conditioned stimuli should be reënforced by the biologically adequate stimuli. The more closely the conditioned reflexes are connected with the natural reflexes, the more frequently the conditioned stimuli are reënforced by the unconditioned, the stronger and more permanent they become.

That such reflexes are acquired and not inherited seems to be demonstrated by the fact that Pavlov in his experiments developed associations which could by no possibility have been a part of the experience of the animal's ancestors. In one experiment, for example, every time a dog was fed, a piece of ice was applied to a certain part of the skin. After repetition for a week or two the application of the ice to the same part of the skin would call forth a flow of saliva without the feeding. Again in other experiments a note of a certain pitch accompanied the taking of the food, and after sufficient repetition this note would call forth the flow of saliva, but a different note was ineffectual.

Conditioned vs. Unconditioned Reflexes.—Thus the distinction between the conditioned reflexes and unconditioned reflexes is obvious. The unconditioned reflexes are inherited, permanent, regular, inevitable. The conditioned reflexes are temporary, irregular, more or

less capricious, usually occurring, but not always. Again in the unconditioned reflex the functioning of the cortex is not involved. Such reflexes would take place in an animal deprived of his cerebral hemispheres, and may occur under the influence of an anæsthetic. On the other hand, the conditioned reflex involves the functioning of the cerebral cortex and the formation of associations: it does not occur under the influence of an anæsthetic or in deep sleep.

One should note the way these terms are used. The ordinary reflex is called an unconditioned reflex, the reflex resulting from an associated stimulus is called a conditioned reflex, and the associated stimulus which produces the conditioned reflex is called a conditioned stimulus. These terms should be kept clearly in mind, especially the fact that the associated stimulus which produces the conditioned reflex is called a conditioned or associated stimulus.

An Objective Method.—Since the association of stimuli occurs in the brain cortex, the significance of the method of the conditioned reflex lies in the fact that it presents an objective method for the study of what occurs in this higher part of the brain, which seems to be entirely shut out from objective investigation in the living individual. The mechanism of cerebral association we do not know. Apparently what occurs is briefly and essentially this: When a certain part of the cortex is excited by a stimulus from the external world, the excitation is diffused to adjacent areas in accordance with the fundamental characteristic of conductivity in nervous tissue; and so other areas are made especially susceptible to stimulation, and a sensation from any receptor organ occurring at that time, striking a part of the cortex which is in a condition of excitability, be-

comes associated with the other stimuli that are affecting the cortex. Thus, whenever two stimuli occur simultaneously, they become associated.

The Diffusion of Stimuli.—This diffusion of stimuli in the nervous tissue of the cortex and its effects are illustrated by an old experiment. If a portion of the cortex is stimulated, certain muscles contract. If the stimulation is continued, the diffusion extends and finally spreads over the whole cortex, and then many other muscles are thrown into contraction.

If this simple neural explanation is correct, then we should expect that the stimulus to be associated with the original stimulus must reach the brain cortex while it is in the condition of excitability caused by the original stimulus, that it would not be effective after this excitation had died out. Now this is precisely what is found to be the fact. We have reason to believe that the excitation caused by any ordinary stimulus from a receptor organ is temporary and fleeting, that it usually continues at most only a few seconds. In case of the salivary reflex of the dog, for example, many experiments have shown that if the desired stimulus to be associated with the original stimulus is applied ten seconds before the dog is fed, or if it is applied during the feeding, the association occurs, and the conditioned reflex is formed; if, on the other hand, the stimulus is not applied until after the cortical excitation has subsided, a conditioned reflex cannot be established, no matter how often the repetition occurs. In case of the ringing of the bell, for example, as an associated stimulus, if the bell is rung simultaneously with the feeding of the meat, an association is formed and the conditioned reflex developed; if, on the contrary, the ringing of the

bell does not occur till ten seconds or more after the feeding, the conditioned reflex can not be formed.

Fear and Rage.—The stronger the stimulation the wider the range of its influence. Thus Mosso [52] and others long ago showed that in case of fear all the glands and muscles of the body are likely to be affected. It seems to be the same in case of rage. The following illustration is given by Morgulis: [50]

A watch dog of a highly nervous temperament with a well-formed conditioned reflex is the subject of an experiment, which is to be conducted by a stranger. The appearance of this stranger in the laboratory, especially if his manner is at all provocative, causes a furious outburst of an aggressive reaction on the part of the dog. The stranger proceeds with the experiment in spite of the dog's excitement, applies the familiar conditioned stimulus, and, to the general astonishment, gets an unparalleled response from the salivary gland. If he continues the experiment longer and the dog gradually becomes quiet, the conditioned salivary reflex commences to fade and at last the secretion ceases. The least movement on the part of the stranger will at once rouse the dog's fury and immediately thereupon the conditioned salivary reflex will wax strong again and the story will repeat itself.

Inhibition

Pavlov's experiments have thus made clear what the conditioned reflex is—namely, a reflex produced by any indifferent stimulus associated with a biologically adequate stimulus. In other words, if an indifferent stimulus is repeated a certain number of times simultaneously with the biologically adequate stimulus, an association is formed so that it comes to pass that the associated indifferent stimulus produces precisely the same physiological effect. If we could leave the whole matter here, it would be relatively simple; but the processes in nature

are seldom simple; and in this particular case we have yet to consider the other side of the whole matter—namely, the function of inhibition.

If one scratches a dog every time he is fed, then the scratching becomes a conditioned stimulus; that is, it occasions a secretion of saliva when no food is given. Now when a conditioned reflex of this kind has been formed, if, during the scratching, a new stimulus—say, for example, a tone—is added, immediately the scratching stimulus loses its effect. Also, the adding of another unusual tone to a usual one inhibits the salivary reflex, the stronger the tone, the greater the inhibition. Pavlov and his students have made extended investigations of the different forms of inhibition, and they find that such a simple reflex as the secretion of saliva is influenced by innumerable factors, not only by the more intense stimuli, but by any stimulus from the environment, by any sound, however weak, the flickering of a light, a shadow on a window, or even a draft of air or the like.

Inhibition Removed by Other Stimuli.—It should be noted that this condition of inhibition in turn is very unstable and easily removed by the occurrence of other stimuli. If, when a conditioned reflex has died out for lack of reënforcement of the associated stimulus with the original stimulus, some new stimulus suddenly occurs—for example, the flash of an electric light thrown into the dog's eyes, a stimulus that has no relation to the original stimulus—it acts at once as an inhibition of the inhibition; that is, the sudden flash of the electric light removes the inhibiting stimulus and reëstablishes the conditioned reflex. One or two illustrations given by Anrep may be cited:[1]

After repeated experiments with Dog 4, when the differentiation of the second sound had been firmly established [so that no secretion was expected], something irritated the mucous membrane of the animal's nose and the dog sneezed. Three minutes later an inactive note was sounded, and, instead of the zero anticipated, 28 drops of saliva were registered. No secretion was caused by the sneezing, but the irritation produced inhibited the inhibition.

In another case, when experimenting with Dog 4, a large fly flew into the room; this very slight noise was quite sufficient to inhibit the inhibition and to cause the secretion of 15 drops. If a metronome or a simple bell is set in action during the sound of the inactive tone, one gets a still greater effect.

Thus the Russian investigators have shown the significance of inhibition for the higher centers as Sherrington has for the muscles—that is, that in all development and training of the central nervous system, inhibition is as important as response. According to Krasnogorski, stimulation and inhibition are in a certain sense the two halves of one and the same activity of the nervous system. And he maintains that in the conditioned reflex we have an almost ideal method of investigating the process of central inhibition in children.

We may simplify the complexity of the whole matter by a general statement such as that given by Anrep:[1]

> Each extra stimulus in turn inhibits the conditioned activity of the brain, superimposing itself on the process it encounters in every part of the same. If it meets with excitation, it inhibits the excitatory process; if it meets with inhibition, it inhibits the inhibition.

While some difficulties may be connected with this view, and Pavlov himself would perhaps deem it unnecessary, it seems permissible as a tentative statement.

Associated stimuli, on account of their unstable character, are especially liable to inhibition. Several different forms of inhibition occur. The enumeration of them by Morgulis may be given: [51]

> There are several kinds of internal inhibition. Waning conditioned reflexes, due to a repeated application of the conditioned salivary stimulus without the aid of an unconditioned stimulus, is one kind. Another kind is the delayed reflex which appears if the conditioned stimuli are regularly followed by feeding a few seconds or even minutes after the conditioned stimulation has ceased. Conditioned inhibition is likewise a form of internal inhibition arising when an irrelevant factor is added to the conditioned stimulus, the combination not being reinforced by feeding. In such a combination the conditioned stimulus is quite ineffective, but alone it exerts the usual influence. The process of differentiation and concentration . . . represents a still other type of internal inhibition—the inhibition of differentiation. Furthermore, it is a very common and very important occurrence that an inhibition checks another inhibition, the result being a reactivation of the inhibited reflex.

In recent papers on the basis of his study of twenty years and the investigations of some hundred students, Pavlov sums up his views in regard to inhibition and sleep and describes the different forms of inhibition perhaps more clearly.[59] He distinguishes two great classes of inhibition, internal and external inhibition. The external inhibition consists of every new activity of the cortex called forth by other stimuli. This is analogous to the inhibition long established in other parts of the central nervous system. It is of the kind illustrated above by Anrep. Of internal inhibition four different kinds are distinguished.

Kinds of Internal Inhibition.—The different forms of internal inhibition are as follows:

First is the extinction of the conditioned reflex so-called. This occurs when the conditioned stimulus is not reënforced by association with the unconditioned stimulus.

Second is the delayed reflex. It occurs when the unconditioned stimulus, the food, is not given until several minutes after the conditioned stimulus is applied. This is called, more accurately perhaps, a memory reflex.

Third is the conditioned inhibition. With his conditioned stimulus, a tone, for example, Pavlov combines another stimulus, perhaps mechanical stimulation of the skin. With this combination he does not feed the animal; without it he does. In this case the conditioned stimulus gradually loses its effect completely in this combination, but is still effective without it. That is, whenever the tone is given at the same time with the stimulation of the skin its effect is inhibited. This form of inhibition Pavlov calls conditioned inhibition.

Fourth is the inhibition of differentiation. This Pavlov describes as follows: Mechanical stimulation of a definite part of the skin is used as a conditioned stimulus. Then likewise stimulation of other parts of the skin, more so the nearer it is to the definite place, has the same effect, that is, acts as a conditioned stimulus. This generalization of the stimuli has a definite biological significance and represents the externalization of the irradiated stimulus in the mass of the cortex. In case of repetition of stimulation of this definite part of the skin with the accompaniment of feeding, and with repeated application to other parts without feeding, the latter parts gradually lose their stimulating effect. This form of inhibition Pavlov calls differentiating inhibition; and with this the analyzing ability which produces the

fine adjustment of the organism to the elements of its internal and external world attains its acme.

It should be noted that all these forms of inhibition and also the cases of inhibition of another inhibition involve association as well as the simple cases of ordinary conditioned reflexes.

While we can not determine the first appearance of associative memory in the history of animal evolution, and although its possession makes the animal the easy victim of accidental circumstances, it also makes rapid advance possible, for it enables the individual to profit by his own experience, and the power to acquire conditioned reflexes makes learning and training possible.

The Conditioned Reflex in the Training of Animals

The discovery by Pavlov was remarkable, but, like many other great discoveries, it was in one sense very simple. For thousands of years nature has been forming conditioned reflexes and inhibitions; and the training of animals furnishes a multitude of illustrations. Any observer of children and animals can give examples.

In case of one of our Worcester dogs who is fond of visitors, the ringing of the doorbell has become associated with the coming of callers, so that whenever the dog hears the bell ring, he comes tearing into the house. The housemaid has discovered that when it is necessary to lock the dog up, the ringing of the bell is a convenient method for bringing him into the house. The presence of callers was the original stimulus, coming into the house the response. The ringing of the doorbell is the associated stimulus. It produces the same response—coming into the house—as a conditioned response.

A conditioned reflex is often established by shock or

by a single intense association between the original stimulus and the associated stimulus. This can frequently be observed in the ordinary behavior of animals. Watson cites the well-known case of the horse frightened in a definite spot and afterwards always showing fear when passing that particular place.

Examples of Inhibition.—From the training of animals we have noteworthy examples also of the power of inhibitory stimuli. Kalischer has given so-called tone training to different animals. With monkeys, by giving them food with a certain definite tone and withholding it with other tones, he habituated them to grasping the food only at the proper tone, the one associated with the giving and eating of the food. In another case, a Boston terrier was taught to sit in his chair with meat placed before him until permission was given to take the food. Even when the dog's favorite food was placed directly under his nose and he was left in the room alone, he would not touch the food until his master returned and permission was given. In their natural environment also scores of inhibitions in animals are developed.

Whether it be the training that an animal gets from adaptation to his environment or whether it be the education of the animal by a special trainer, it is the same, largely a matter of conditioned reflexes, with all the advantages and the dangers of facilitation and inhibition.

If one reads a book like Bostock's *The Training of Wild Animals*,[5] one sees how largely the training consists in the development of conditioned reflexes. A wild animal, as Bostock notes, is always liable to go wild. A shock, an unusual occurrence, or any one of a hundred unconventional things may arouse again the old

savage instinctive reactions. Hence the trainer must always give the performance in the same way and must always give the conventional signals as stimuli, that is, the customary conditioned stimuli must be given.

If an animal is sent to the right side on entering the arena the first day, he is sent to the right every day thereafter, and the direction in which he goes after leaving his pedestal, and before taking his place in the group, is always the same. Each animal, too, in a group has his own place and his own time for assuming the place; and should he once leave it, there would be danger to the whole performance. The trainer, too, even in walking about the arena, always walks in the same way, and gives his closest attention to the prevention of the happening of anything unusual.

Performing animals particularly dislike a change in the stage setting, and it is absolutely necessary, whenever a new one is contemplated, to accustom them to it by the most gradual means. There have been times when an animal, seeing a new barrel or block for the first time, would attack it with such gusto that not only would the objectionable piece of furniture be destroyed, but so much excitement would be communicated to the other animals that it would be found impossible to go on with the act.

According to Bostock most wild animals are fond of music and in most cases it is their principal cue. Naturally enough it becomes a conditioned stimulus for many reactions. He relates the following experience which is instructive:

Some time ago the band of a traveling show went on strike in the middle of a performance, and left in a body. Three trained tigers were the next feature on the program. When they came on they looked inquiringly at the orchestra for the music, and then two of them quietly settled down on their haunches and refused to go on. The third, who was of less experience, made a feeble start and then joined his companions on strike. Orders, commands, threats, and flickings

of the whip were useless. No music, no performance, was obviously the motto of these tigers; and they stuck to it until finally the trainer, finding that to try to force them further was dangerous, was obliged to let them return to their cage without giving any performance at all.

Bostock feared that he could never get the animals to perform again, but the next day, when the musicians had returned to their work, the tigers seemed perfectly satisfied as soon as they heard the music and acquitted themselves better than ever. Clearly the sound of the music had become a conditioned stimulus to the performance of the animals.

In the special training of animals we have to do chiefly with the establishment of conditioned reflexes.

Tricks as Conditioned Reflexes.—A friend of mine taught his dog to sneeze at the word of command. I asked my friend how in the world he succeeded in teaching the dog to do this. He told me that in the first place he rubbed the dog's nose and made him sneeze in this way, and then praised him for it, and after a time the dog acquired the habit, so that he would sneeze at any time at his master's command.

Here we have apparently an excellent illustration of the development of a conditioned reflex. First, by rubbing the dog's nose an unconditioned reflex was produced, sneezing in response to the peripheral stimulation; then giving the word of command to sneeze in connection with the stimulus of rubbing the nose we have in the ordinary way a conditioned reflex developed; the word of command being, of course, the conditioned stimulus, and this becoming associated with the unconditioned stimulus of rubbing the nose, until finally the associated stimulus, namely, the command, was sufficient by itself to produce the reaction.

The excellence of an animal's training depends on the care and success with which the right conditioned reflexes are developed. But this training is always unstable because conditioned reflexes are unstable; and hence in case of wild animals, as Bostock has said, "they are trained, but never tamed."

Trained Elephants.—Of all the well-known animals in captivity the elephant is, perhaps, aside from the monkey, the most intelligent and also the most emotional. The keepers of these animals never know when they may stampede, never know what violence may begin at any moment. Especially when the emotion of fear is thoroughly aroused, the behavior of these animals is at once insane and terrific, and widespread disaster is likely to result. Their training gives remarkable illustration of control by conditioned responses.

Whenever a herd of elephants become frightened and stampede, the only thing to do is to inhibit their fright by the familar appeal of a keeper whom they have come to love and depend upon, and to bring them under the control of a system of conditioned reflexes. A remarkable illustration of the way this can sometimes be done was given a few years ago when a herd of elephants stampeded during a parade in Berkeley, California, as recounted by Mr. Cooper. [16]

Soon after this parade started, as the herd of twelve animals were marching along peacefully, suddenly 300 students from the University joined the parade, directly behind the line of elephants, chanting a monotonous college song and stamping their feet on the pavement. The eyes of the elephants began to roll, their ears distended, their heavy skins began to wrinkle. Soon the students broke into a class yell, and then the stampede began.

The manager of the elephants had prepared for this, and so rushed his herd out of their place and toward the front of the procession, going ahead at a furious pace, and passing to the front of the whole parade, meanwhile giving the familiar orders to take hold of tails—"Tails there, tails there, tails." The result is described as follows:

It was a double command, which traveled along the line and back again as fast as men could voice it, the order to run, and at the same time for each elephant to grasp the tail of the beast before him. Blocks passed while throats grew hoarse, and while the thick-packed throngs of the curbings stared vacuously, wondering why the circus should be in such a hurry to get its elephants out of the line of march.

But never a warning sounded, never a hint that a panic was in progress—only that repeated and repeated command: "Tails there! Mule up, you! Tails—tails!"

Another two blocks and the command changed; more, the elephant line obeyed. A block after that, and the whole section was peacefully shuffling along again, simply through the fact that the frightened beasts had been made to believe that their trainer really desired them to run, and that in their breakaway they were merely carrying out orders. Nor could they know that in obeying the command of tails, they handicapped themselves so that the speed of one could be no greater than that of another, and that as long as the leader kept to a straight line, so must the rest.

Further, the occupation of their single-track minds in the execution of an order which coincided with their natural tendencies had wiped out in forgetfulness the fact that something had threatened them, and brought to them the belief that their trainer merely was running them away from an obnoxious thing. Therefore, when the command came to slow down they did so in confidence, and in the assurance that any danger was over. Many a person went that day from watching the parade, wondering perhaps why the elephant trainer should desire to put his beasts through their paces. But few of them realized

that the little play of speed had saved not only the circus but the downtown section of Berkeley, with its thronged sidewalks, from disaster.

The description given by the writer in non-technical anthropomorphic terms, naturally attributes a degree of reasoning to this behavior that need not be assumed, since what really happened was the inhibition of the emotional behavior of the elephants by a habit, or a system of conditioned reflexes; and as soon as the familiar response in such reflexes occurred, then the elephants were ready to take the next order, that is, the next conditioned stimulus in its natural sequence and slow down their march when the order for this came.

This is a remedy for a stampede that is often effectual and likely always to be useful if it can be quickly supplied. In the words of Mr. Cooper,[16] "The trick works time after time—it is the standby of the elephant keeper, his first hope at the beginning of a breakaway."

Here apparently is the reverse of what usually happens. While first we have running as the reaction to the stimulus of fear, when this stimulus is reënforced by the command to run given by the keeper, soon the same response of running is brought about in part at least by the conditioned stimuli of the commands of the keeper; and then the natural sequence of commands and movements, or conditioned stimuli and responses, is substituted for the emotional stimulation and response.

Permanent Reflexes.—How permanent such conditioned reflexes may become by long continued training, and how completely automatic the activity, if only the right associated stimuli for the given form of behavior can be supplied, is illustrated by another incident reported by Mr. Cooper, where an elephant which

had long been well behaved, finally went bad. After overturning wagons, throwing a workman thirty feet into an irrigation ditch, overturning cages, making a wreck generally, and finally receiving a lot of leaden bullets in his head, hardly noticing their impact, he suddenly went into the performing tent.

Into the center ring he rushed, to halt, a single elephant in the middle of a deserted circus tent. There, alone, *sans* the music, *sans* the crowd, *sans* the brilliance and the brightness which usually accompanied the performance, Floto the outlaw, the blood streaming from thirty bullet holes, without guidance, without even a cue, went through the every figure of his act, while at the connections the men of the circus stood and watched, unable to cope with him, unable to kill him, unable to conquer him—watched while he waltzed about the ring, while he knelt over an imaginary trainer, while he walked on his hind feet; and while, with a sudden change of thought, he crashed across the stage, tore down a section of seats, and then, bursting through the side wall, ran for the open country.

Educated Horses.—Unfortunately, up to the present time, no extended investigations of the conditioned reflex in horses have been made, and yet apparently the remarkable accomplishments in arithmetic and the like by *"der kluge Hans"* and other trained horses are to be explained chiefly by the psychology of association. Dr. Pfungst and others who carefully studied Hans, found evidence that the horse got most of his information through the eyes, and that the cue was usually certain minute unconscious movements by the trainer and questioner, to whom the horse gave careful attention.

Sanford, who has made careful study of these educated horses, points out that minute movements are a common means of control in the management of trick

horses.[61] In the case of Hans they were extremely minute and yet sufficient to give the necessary stimuli. Sanford points out that unconscious movements are probably extremely common, the normal and regular thing, especially under conditions of considerable concentration, "when their unconsciousness is doubly guaranteed"; and he concludes, "that such unconscious movements once present could grow up into a habit on the part of the master and into a set of signals for the horse, is not hard to understand when we think of the process of training through which the horse was put" day after day for some four years. Dr. Sanford says:[61]

> We may sum the whole thing up by saying that they seemed to Dr. Pfungst and his colleagues to put it beyond question that all of the answers which Hans gave were merely sets of movements controlled by signals from his questioner.
>
> And so we have, as the result of these careful studies, a horse proved to be destitute of the human mental powers with which he had been credited, but demonstrated to be astonishingly responsive to almost imperceptible movements, and ready enough to make use of them and of the faculties of such a mind as he had for the sorts of results in which he as a horse was interested, namely, bread and carrots.

At one time the writer had an excellent horse, but high-strung and at once very nervous and very intelligent. The behavior of this animal bristled with conditioned reflexes, some remarkably good, others very bad. The animal's training had apparently been unfortunate in some respects, and he had probably suffered at one time or another very severe punishment. In any case, at the time referred to, punishment was out of the question. The associated stimuli of the words used, the tone of one's voice, or even one's gestures were quite sufficient to bring about responses of fear, if not of rage.

For a concrete illustration, if the horse were tied and any one approached him with an attitude of hesitation, or doubt, or fear, the horse at once backed away from the post; and if one attempted to tighten the rope or adjust the halter, he pulled with such violence that he was likely to pull up the post or break the halter, whichever happened to be weaker. Since posts frequently and headstalls or halters usually are weaker than the muscles in a horse's neck, posts and harnesses were always liable to be sacrificed if the one in charge of the horse did not recognize and humor his habits of response. In general, it might be said that this horse was just as good as his driver expected him to be and no better. If the driver expected him to be bad, he would seldom disappoint him. If, on the contrary, he expected him to be good, he would seldom misbehave.

This animal furnished beautiful illustrations of the potency of those slight movements, gestures, and the like, which Bostock and others have emphasized as so significant for an animal's behavior. Bostock relates that when a trainer has acquired some personal vice or a character in some slight degree disintegrated, so that he does not approach the wild animal with his usual self-confidence and straightforwardness, the man is at once in danger and his usefulness likely to be at an end. The animal responds to the slight lack of coördination in the trainer. In like manner, this horse took his cue from the actions of his driver, and doubt or lack of assurance meant to the animal an untrustworthy master with whom revolt at the outset was the natural response.

With this horse one could do any of the hundred things required on a farm; at will one could command a slow movement by inches with a strong and steady pull,

or, on the other hand, quick action when necessary. But he had his own code of rules and was extreme in his devotion to convention. Follow these rules and the customary mode of procedure, and he was docile, well mannered, and helpful in the process of harnessing and the like. Any slight variation, however, from his puritanical code of manners and morals, was the signal for protest and revolt that meant disaster to any one rash enough to insist on a different method or sequence. Although he was distinctly amiable and pleasingly helpful in harnessing, for example, if one made a mistake and did not adjust the bridle properly, and then attempted to readjust it afterward, his head went into the air in protest, and if one insisted upon this readjustment, the result was a hopeless conflict. On the other hand, take off the bridle, begin again in the conventional order, and the horse put down his head, ready to take in the bits and assist in the process with the best behavior in the world.

In case of most horses perhaps of highstrung temperament, if an accident occurs, the animal at once exhibits the responses of excitement and fear. Another horse, driven for many years by the writer, had this unfortunate characteristic in a serious manner on occasion of accidents. But perhaps the most remarkable exhibition of the healthful conditioned reflexes developed in the early training of the horse we have described was the rather amazing habit he had acquired of stopping quietly and waiting if an accident occurred. A new stimulus or an unusual change in the situation meant for him the response of inhibiting reaction and waiting.

This conditioned reflex or series of conditioned reflexes had apparently developed to an unbelievable degree, which on one occasion saved the animal from seri-

ous and probably fatal injury. One night a defective plank in the floor of the stall where he was fastened broke, and his leg went through the flooring. The cellar below was perhaps six feet in depth, and the danger to the horse was imminent. Apparently, however, with his usual habit of response, when the accident occurred, instead of kicking and thrashing about, he lay quietly until he was found in the morning. As evidence that he had remained quietly through the night, he had suffered no distinct harm, and when found, waited patiently until rescued. It is hardly too much to say that healthful conditioned reflexes are as important in the hygiene of a horse as in that of a human being.

Not to speak in detail of the characteristics of this horse, if the reader will pardon a moment of anthropomorphism, it may be said that he had such a pleasing personality it was a pleasure to work with him, and he furnished an excellent illustration of the possibilities and dangers of the conditioned reflex in the training of animals.

Learned Responses.—Thus the behavior of an animal, apart from the direct reactions to a few primitive impulses and instincts, like hunger, fear, and the like, is conditioned by the stimuli of the animal's environment or of the familiar commands or signals given in special training; and the character of its education depends on the kind of conditioned reflexes, systems of conditioned reflexes or habits, and associations, thus developed.

Learning everywhere under competent instruction is a means of integrating the psychophysic organism of the animal to the end that right adjustments may be made. In the training of animals in the laboratory this is illustrated, as well as in the ordinary training of which

examples have been given. It is not the place here to study the psychology of learning. It should, however, be noted that learning in children as well as animals consists largely in acquiring responses to stimuli that before the learning were indifferent. For the other aspects of learning one may consult Meumann.[49]

Problems and Questions

1. Recall what you know about the laws of association, and read the account of the different kinds of association in the book by Warren.
2. Give illustrations both of the association of ideas and of the association of stimuli.
3. Give examples of conditioned reflexes that you have observed in animals.
4. Give examples of the responses of animals to indifferent stimuli in their ordinary spontaneous activity.
5. Give examples of the inhibition of responses in animals by associated stimuli.
6. What is the special significance of Pavlov's method?
7. Why does Pavlov take such great care in arranging the room and the apparatus for his experiments?
8. Give examples of tricks that you have observed where animals by training have developed conditioned reflexes.
9. Explain, if you can, the remarkable performance of educated animals you have observed, noting any unconscious movements or the like that serve as signs or clues.
10. How far do the methods by which animals learn illustrate the principles of all forms of learning?
11. Make a summary of the more important points in this chapter.

CHAPTER IV

THE CONDITIONED REFLEX IN THE CHILD

PAVLOV'S students have produced a large amount of data from the study of animals.[1 50 19*] If you sound a definite tone every time you give the dog meat, then that tone becomes associated with the original stimulus and produces the flow of saliva without the meat. Whistling is capable of association to produce the same conditioned reflex. Scratch the dog in a definite place every time he is fed, and a conditioned reflex is formed for the scratching. Even pain on a definite spot of the skin may become associated to produce a similar conditioned reflex. In a word, apparently the sensation from any receptor organ may become a conditioned stimulus.

Now when a piece of meat is the stimulus that makes the dog's mouth water, it does not especially excite our wonder, because we are familiar with such simple reactions; but when an entirely indifferent stimulus—a musical note, or the ringing of a bell, a piece of ice on the skin, or even a painful sensation, an electric shock, or the like—becomes associated with the meat and produces the same reaction of the gland, it certainly is remarkable; and possibly for every gland in the body

* Bibliographical references throughout this chapter are to the bibliography at the end of Chapter VI on page 165.

and for every motor organ, similarly associated stimuli can produce specific reactions.

Conditioned Responses in Children

Children, however, as well as dogs, can respond with their glands or motor organs to bells, bright lights, colors, electric shocks and other stimuli, if associated with the giving of food or the like. The larger significance of these studies of the conditioned reflex in animals is due to the fact that Bechterew [2] and Krasnogorski [40] in Russia, Mateer [47] at Clark University, Watson [68] at Johns Hopkins, and Lashley,[42] and others, have found that in children similar conditioned reflexes can be formed, conditioned reflexes for the salivary glands, conditioned reflexes also for motor organs. Several methods have been used by these investigators.

Methods.—Lashley, in the Johns Hopkins laboratory, invented a device by which the secretion of saliva in children can be determined.[43] This apparatus contains two concentric chambers that open into two separate tubes. The instrument is adjusted to the inner surface of the cheek so that the central chamber covers the opening of Stenson's duct, which leads from each parotid gland. The saliva passes off through the tube and the amount secreted under different conditions can be measured. The result of one test, shown in the following table, illustrates the way the device works:

Normal rate: about one drop per minute.	
Chocolate placed in subject's hand:	
1st minute	4 drops
2nd minute	3 drops
3rd minute	4 drops
Subject smelled chocolate	5 drops
Brought chocolate to lips but kept mouth closed	9 drops

Other Methods with Children.—Thus practically the same methods can be used with children as with animals, and similar results are found.

Krasnogorski employed Pavlov's method of the conditioned reflex in the study of children, taking as the response of the child a motor reflex, namely, the opening of the mouth and swallowing in case of older children, and sucking movements in case of infants. By the aid of this method he reports that he was able to observe in children quite accurately the origin, development, and extinction of different conditioned reflexes and to establish certain laws of such reactions.

Mateer at Clark University used a method similar to that of Krasnogorski, and showed the value of the method. Watson at Johns Hopkins in his earlier experiments adopted one of Bechterew's methods, using an electrical stimulus to the toe or finger, the motor reflex as the response, and the ringing of a bell as the conditioned stimulus. Similar methods with adults have been used by Hamel [25] and others.

Experimental Studies

A few of the experimental studies of the conditioned reflex should be especially considered. To this country apparently belongs the honor at least of beginning the experiments on motor conditioned reflexes.

A Study of the Knee Jerk.—About twenty-five years ago Twitmyer, in the laboratory of the University of Pennsylvania, studied the normal knee jerk.[66] This is directly caused by the sudden and vigorous contraction of the quadriceps muscle of the thigh. As is well known, a blow on the patella of the knee brings about

the knee-jerk reflex * as a response. Twitmyer studied this with an apparatus by which at the stroke of a bell a hammer struck the patella. One day the apparatus was out of order, the bell sounded, the hammer did not strike, but the knee jerk occurred. The account is best given in Twitmyer's own words:

During the adjustment of the apparatus for an earlier group of experiments with one subject (Subject A) a decided kick of both legs was observed to follow a tap of the signal bell occurring without the usual blow of the hammers on the tendons. It was at first believed that the subject had merely voluntarily kicked out the legs, but upon being questioned, he stated that although quite conscious of the movement as it was taking place, it had not been caused by a volitional effort, and, further, that the subjective feeling accompanying the movement was similar to the feeling of the movement following the blow on the tendons with the exception that he was quite conscious that the tendons had not been struck.

After this remarkable occurrence Twitmyer arranged a series of experiments especially to test the possibility of the knee jerk without direct muscular stimulation. Although at that time the method of the conditioned reflex was not known, at least in this country, the experiment was arranged very much as one would arrange experiments for producing motor conditioned reflexes to-day; and in most of his subjects conditioned reflexes were produced. Some other experimenters have found difficulty in obtaining the conditioned knee jerk, perhaps because sufficient care was not taken to control conditions; but Twitmyer's result seems to be well established.

* It is maintained by some physiologists that this is not a true reflex. Whether they are correct or not, the response in Twitmyer's experiments that occurred without the blow of the hammer was conditioned and due to reflex influence apparently.

True Reflexes.—It is noteworthy that these reflex movements were not the result of voluntary effort.

Each subject gave unqualified testimony on this point. This testimony is further corroborated by the fact that the subjects were kept in absolute ignorance as to the nature of the experiments about to be performed and consequently did not know when to expect the blow and when not to expect it. Further, the position in which the subjects were placed made it impossible for them to observe when the hammers were about to be caught before striking the tendons. The kinæsthetic sensations resulting from these movements and the more general subjective feeling could not be distinguished from those aroused when the movements followed the actual blows on the tendons. The subjects were, however, always aware of the fact when the tendons had not been struck. Considerable confidence may be placed in this testimony; for all the subjects had been students of psychology for two years and were consequently familiar with the method of introspective examination. Therefore, as far as the data of introspection are concerned, it can be definitely stated that there is no difference between these movements and the true knee jerk.

The result is the more significant because it occurred in the first place in an experiment directed to quite a different purpose.

The Knee-Jerk Imperative.—An effort on the part of one subject to inhibit the kicks was wholly unsuccessful. "Later experiments on another subject completely confirmed this result. This corresponds exactly with the well-known fact that the knee jerk cannot be voluntarily inhibited without actual contraction of the flexor muscles of the thigh." All the subjects testified that the kick was not voluntary, and there was no idea of the movement in consciousness prior to the movement itself.

This pioneer investigation, although not made upon children, is well worthy of study. More recently a num-

ber of laboratory investigations of the motor conditioned reflex have been made down to the recently reported technical study of the conditioned eyelid reaction by Cason.[15]

Krasnogorski's Study.—Krasnogorski was apparently the first to use the method of the conditioned reflex in a study of what may be called the mental hygiene of childhood.[40] [41] The report of his investigation appeared in the *Jahrbuch für Kinderheilkunde,* and perhaps for this reason seems to have received little attention from psychologists and students of childhood in this country.

The investigation by Krasnogorski was a pioneer piece of work, the number of children tested was small, his methods rather crude, the report of his results incomplete; but his work is so important as a special attempt to use an objective method in the study of the development and functioning of the brain cortex in children that we may well give attention to it somewhat in detail. The account will be given very much as he reports his results, even though they may need to be modified somewhat in view of more recent studies.

Opening the Mouth as a Conditioned Reflex.—Krasnogorski's first method was in substance as follows: He chose as a reflex opening the mouth and swallowing. These motor coördinations were recorded by the plate of a Marey tambour placed over the thyroid cartilage and connected with a pencil which traced the movement on a kymograph. The child was placed quietly on a table in an isolated room and the eyes were bandaged to shut out visual stimuli. First a control record with the child quiet was taken. Next the child was fed a bonbon of chocolate or the like simultaneously with the sound of a bell or tone. The first experiments were made with three children, and conditioned re-

flexes formed after a few repetitions in the case of each. The main results were as follows: The ability to form conditioned reflexes develops earlier in some children probably than in others. It develops earlier perhaps for some receptor organs than for others, and apparently it develops earlier for normal children than for the feeble-minded.

In the first two or three months of life, according to Krasnogorski, the cortex is so little developed that the different associations in general cannot be formed. In the second half of the first year of life the formation of such associations for all receiving surfaces, the eye, the ear, the nose, skin, is possible; but it occurs more slowly than in later life. Not until in the course of the second year does the mechanism of the conditioned reflex attain its complete development and functional perfection.

Memory Reflexes.—Not only does the reaction of the salivary glands, as we have seen, occur in response to an indirect stimulus, for example, the stimulation of the skin occurring simultaneously with feeding, but Pavlov found that the mere memory of the indirect stimulus may also bring about the response of the glands. If, for example, a dog is repeatedly fed, not during the period when the skin is stimulated, but not until two minutes later, that is, after the immediate stimulation of the skin has passed and there are in the cortex only traces of this stimulation, then after some repetitions this stimulation will call forth no secretion until two minutes afterwards; thus not the skin stimulation as such, but the memory of this becomes the excitation for the salivary glands. The same is true of the child. If a child is repeatedly given a chocolate bonbon, not when the dermal or other sensory stimulus is applied,

but two minutes later, then after a dozen or more repetitions the response of opening the mouth will occur, not when the dermal stimulus is applied, but two minutes later. This class of conditioned reflexes Krasnogorski distinguishes as specific residuum reflexes, or we may call them memory reflexes. The characteristics of these distinguish the functioning of the human brain from that of the animal.

The memory reflexes in case of the dog show quite distinct characteristics. They are completely free from any specific character, such as characterizes the usual conditioned reflexes. If, for example, a reflex is formed for the memory of dermal stimuli, then the secretion of saliva occurs not only after the skin stimulation, but after all other possible stimuli—tones, noises, smells, etc. Another characteristic feature of this reflex is its unusually quick almost sudden extinction, the great secretion of saliva, and the vigorous motor reaction. It is very different in case of children. A highly specific character and extraordinary precision are characteristic marks of memory reflexes in them. If, for example, in case of a child the memory of the sound of a metronome is made the excitation for opening the mouth, then the motor reaction occurs from the beginning only after this stimulus, while other stimuli, even related ones, for example the blow of a hammer, are absolutely ineffective. Every memory of a stimulus in the case of a child is highly specific and can quickly be brought into temporary association with any activity whatever.

Differences between Child and Animal.—There are also essential differences between man and the animal in respect of the *formation* of the memory reflex. In case of the dog the memory reflexes are formed with great difficulty and easily destroyed. In case of a dog, too, it

is enough to repeat the memory reflex only once without the unconditioned stimulus to destroy the reflex. In normal children, on the other hand, the memory reflexes are formed as easily as the usual temporary associations. The memory reflexes are destroyed in case of the child, not suddenly, but just as the simple conditioned reflexes are. Thus the highly specific character of the memory reflex, the quickness with which it is formed, its duration, its regular and gradual extinction, are the characteristics of this group of reflexes in children.

The development of the mechanism of the memory reflex in the child occurs much later than the development of the mechanism of the usual conditioned reflexes. While the ordinary conditioned reflex may be formed in the first year of life, the mechanism of the specific memory reflex, on the other hand, according to Krasnogorski, is not developed until during the second year.

Memory Reflexes in Defective Children.—It is interesting that in cases of a definite type of "overexcitable neuropathic" children, the specific character of the memory reflex is greatly reduced. In cases of imbecile and debilitated children its formation is difficult; in many idiots this reflex is altogether impossible. As a clinical test, according to Krasnogorski, the memory reflex is of great importance, since it determines the degree of development and the accuracy of the functioning of the cerebral hemispheres and makes possible the diagnosis of cerebral anomalies at an early age.

Analysis.—The next fundamental mechanism in the functioning of the cerebral cortex studied by Krasnogorski is what he calls the mechanism of analysis, or sensory discrimination. Besides the ability of forming temporal associations there occurs also in the cortex

the extraordinarily extended analysis of stimuli from the periphery. According to Pavlov's terminology Krasnogorski names the nervous mechanisms functioning this, analyzers. The analyzers separate the external stimuli into parts, or elements, and by the mechanism of association these parts at any moment can be brought into contact with any desired activity. In a word, the function of the analyzer is the differentiation of stimuli, or sensory discrimination.

Storing and Discharge.—Krasnogorski studied also another mechanism, that of nervous storing and discharge, which in his opinion represents the greatest complexity and the greatest power of adaptation in the child's cortical activity.[41]

In the case of a child five years of age a conditioned reflex had been formed for the sound of a loud ringing bell. For some days repeated dermal stimulations were made without giving bonbons. As a result, the skin stimulation as such was made, he thinks, completely indifferent for the child's nervous system. Then he began again the ringing of the bell, between the separate dermal stimulations, without accompanying the ringing with chocolate, but giving the bonbon only during the dermal stimulation following the ringing. The ringing served as a signal that the first dermal stimulation following would be accompanied by the giving of chocolate. As a result, the first dermal stimulation after the ringing became specific and after some repetitions produced the motor act.

The following is a concrete example. A definite point on the skin of the upper arm was stimulated. No reaction followed. After ten minutes this stimulation was repeated, with no reaction; then after ten minutes more the bell rang for half a minute. The child showed

no reaction. After three minutes the given place on the skin was stimulated, and then a vigorous reaction of the mouth occurred. Thus neither the ringing of the bell nor the stimulation of the skin alone could excite the motor apparatus. Not until the skin stimulation followed the ringing did the motor act occur. The sound of the bell plus the dermal stimulation formed a group of conditioned stimuli that produced the conditioned response.

It is clear that by the stimulation with the ringing a center of stimulation is developed in the cortex. The energy remains stored up in a latent or inhibited condition, but can be discharged at will as soon as the dermal stimulation is received. In this case the dermal stimulation in a certain sense is like pulling the trigger of a loaded gun. We load the nervous mechanism with the ringing stimulus, and this load remains in the cortex and can be discharged at any moment if we move the trigger, that is, if we give the dermal stimulation.

The mechanism of storing and discharge is broken down also in the usual manner by withholding the bonbons which served as the stimulus.

The mechanism of positive and negative storing and discharge, according to Krasnogorski, gives man his great superiority over the animals. It is developed relatively late in children, later than the other mechanisms described. It begins its function at the end of the second year of life, but is still incomplete. Not until the third year of life does it attain its full functional development.

This mechanism is most easily affected by pathological conditions. In case of the majority of nervous children it is seriously disturbed. In the case of one

class of neuropathic children, what Krasnogorski calls the overexcitable type, the formation of this mechanism is very quickly completed, but it persists only for a short time and is soon dissipated. In other words, we have children here who learn very easily and who lose very quickly what they have learned. In the case of a second type of neuropathic children, the dull type, the storing of energy is effected with extreme difficulty. In the case of still another type, the storing is extremely easy, the discharge, on the other hand, occurs with great difficulty. There are children with weak inhibitory mechanism who are very hard to educate, since errors are acquired quickly and held very obstinately. With many imbeciles the formation of positive and negative storing of energy is completely impossible.

Delayed Reactions.—What we have in such cases of storing and discharge is a delayed reaction to a rather complex situation, and the amount of delay possible seems to be roughly correlated with the mental development of animal or child. Hunter has reported experiments on delayed reaction which are interesting in connection with some of Krasnogorski's work. Hunter experimented both with animals and children and found that within certain limits, "rats (one excepted), dogs, raccoons, and children, made successful reactions in situations where the customary determining stimulus was absent at the moment of response." [33] In cases of children the experiments were arranged as follows: The child was told when released by raising a gate to push one of several buttons on the wall, and told that one of them would make a noise, and, if the child pushed the noisy button first, he would receive candy. Then a light was placed over the noisy button. The

child was held five seconds and then allowed to push the button, then the period of delay before releasing the child was increased continuously until an error was made. The delayed reaction experiment with animals showed the maximum delay for rats was ten seconds, for dogs five minutes, for raccoons twenty-five seconds, for children twenty-five minutes.

Mateer's Study.—An extensive and thoroughgoing application of the method of the conditioned reflex with children was made by Dr. Florence Mateer in an investigation carried on at Clark University.[47] Her method was an adaptation and improvement of that used by Krasnogorski. Both these experimenters found that many children were disquieted by the bandage over the eyes, and crying was liable to interfere with the experiment; so Mateer used the bandage itself to give the conditioned stimulus. She describes her method as follows:

> This method was the one used in all experiments reported in this study. The bandage was applied by gently sliding it down over the child's eyes from above, with a slight but firm pressure of one finger over each eye, thus inducing the most certain exclusion of light, and then the bandage was kept in place 20 seconds. In the 11th second the child was fed a bit of sweet chocolate and the bandage was removed at the end of the 20th second. Then the child was allowed to sit up and was kept busy with other tests for the interval that must elapse before the process was repeated. The lying down was itself kept from becoming the conditioning stimulus by frequently laying the child down in the intervals between experiments. The 3-minute interval was used. That is, it was 3 minutes from the initiation of any one stimulation until the beginning of the next stimulation.

Mateer thus modified and improved Krasnogorski's method and used it in the study of both feeble-minded

and normal children, 67 in all.[47] Her task was primarily to test the value of the method; but furthermore she compared the results found by this method of the conditioned reflex with the results of the other usual methods—the Binet-Simon, Yerkes, etc., and calculated the correlation coefficients of the results found among her unselected group of 50 children.

Her study demonstrated the practicability and value of this test as an objective method of studying child behavior. And her results are suggestive in regard to the development of the child's ability to form associations, one general significant result being that with her normal children the power to form associations increases with increasing age. She sums up her results as follows:

> It is clearly to be seen that up until the age of five the number of trials necessary for the formation of the conditioned association decreases rather regularly as the chronological age of the child increases. Above this the curve is not only less regular but the range of trials necessary for any one age is also greater than for the ages just preceding. This can hardly be due to any great difference in the ability of the older children as a group, for they were in most instances (in 15 out of 20) the older brothers and sisters of the younger children used. It may be possible that we have here a symptom of an innate difference of different periods of development. The older child may see or imagine, because of his greater experience, and consequent greater potentiality of associations, possibilities of variation in the procedure to which the younger child is oblivious, being absolutely sure after he has been fed candy under a given condition once or twice that it will appear again under like conditions. Genetically viewed, this difference may be as significant as a mark of old stages of development as are the differences recognized to-day between the adolescent and the pre-adolescent.

The ease and quickness with which children develop the ability to form associations differ greatly with different children. Mateer says:[47]

> It may be interesting to note that no child over two years of age needed more than eight trials, while none under that age used less than seven, none under three years needed less than six, while the minimum number, three, was all that were required by a child in the fourth year. Out of the fifty children, regardless of age, ten needed only three trials, eleven needed four trials, eleven used five trials, while only seven needed six; five needed seven, four needed eight, and two, nine trials.

Watson's Studies.—With a modification of Bechterew's method mentioned above Watson has made important investigations.[68] His device was to give an electric stimulation of the finger, the experimenter sitting in a different room provided with a bank of keys by which he could give at will the sound of a bell coincidentally with the electric current or separate from the current.

In beginning the work with a new subject he first sounded the bell to see if this would directly produce the reflex. In no case did he find the reflex evoked by the bell alone prior to the electric stimulation. Next the bell and shock were given simultaneously for five trials, then the bell alone was tried again. If there was no reaction, then five more stimulations with the bell and current simultaneously were given, and so on. He found that the conditioned reflex appears at first haltingly, that is, appears once and then disappears. The electric shock is then again given. It may next appear twice in succession and then disappear. After a time it appears regularly without the shock every time the bell is sounded; and he reports that he ob-

tained a conditioned reflex in the best cases after fourteen to thirty combined stimulations.

A résumé of a part of his later work can be given in his own words as follows: [74]

> If a subject sits with the palm of his hand upon a metal plate and his middle finger upon a metal bar and an electrical current is sent through the circuit thus completed by the hand, the finger will fly upward from the metal bar the moment the electric shock is given. This painful stimulus is thus the native or fundamental stimulus which calls out the defensive reflex of the finger. The sight of an apple or the sound of a bell will naturally not produce this upward jerk of the finger. On the other hand, if the bell is sounded or the colored object is shown the moment the electric current is completed through the hand, and this routine is repeated several times, the situation becomes wholly different. The finger begins to jerk up reflexly now and then when the bell is rung or the colored object shown even if the electrical current is not sent through the hand. After a longer or shorter period of training the colored object will cause the jump of the finger just as inevitably as does the current.

Conditioned Emotional Reactions.—Watson also made interesting experiments on conditioned emotional reactions in the case of children.[72] The boy Albert, used as the subject of these experiments, was a sturdy youngster, not afraid of anything under the sun except loud noises and violent stimulation, such as removal of his support or the like. He would reach out his hand to seize any animal brought near him, and he never showed fear. By striking a steel bar behind the boy whenever a white rat approached him, a conditioned reaction developed and he soon became afraid of the rat and would show fear by crying and crawling away whenever the rat approached without the primitive stimulus of the noise. Watson's experiments in-

dicate that the original stimuli to fear are few. But anything whatever may become an associated stimulus to fear.

Conditioned Reflexes Produced by Shock.—Apparently many conditioned emotional reactions are developed at an early age. These conditioned reflexes in children are formed in the most commonplace and unsuspected situations, in an ordinary environment as well as in the laboratory. Usually the association is produced by many repetitions. It may be produced by shock. A simple concrete case will serve as illustration.

While a young child was lying in bed, a curtain at one of the windows snapped up suddenly with a loud noise, and the child began to cry. The child was quieted, but the next time he was put in this room, he at once looked up at the window where the curtain was and again began to cry. The father was a physician and removed the child from the room. Had he not done so, a permanent conditioned reflex would very likely have been developed, so that the sight of the curtain would every time have made the child cry as a result of the conditioned reflex set up by the original shock, and his parents would have wondered why in the world the child was afraid of a curtain.

Simple incidents like this are especially instructive because they show that a conditioned reflex may be developed by a single experience, that what is a shock to the child may be the most commonplace and familiar experience to an adult. In this case the cause of the crying was obvious. In a hundred cases it may be unknown. Many of the cases of fear due to shock in early life are probably cases of this kind. Of course, special care should be taken to avoid the formation of such reflexes.

Early Conditioned Reflexes in the Child

According to Krasnogorski,[40] [41] this power of association appears in the first year of life; and observation and the studies by Mateer indicate that in regard to a few things it appears in infancy; and yet, as Krasnogorski maintains, it is not fully developed until during the second year, perhaps not until the child is about two years of age.

The mechanism of conditioned inhibition also, according to Krasnogorski, occurs at the end of the first year of life, and this, according to him, marks the stage when the child can be really educated. Naturally there are individual differences in the time of development, and in the case of feeble-minded children the conditioned inhibition can be formed only with great difficulty or not at all, and such associations have weak inhibitory effect and are easily destroyed. In normal children, however, in the first year or two of life, a vast number of conditioned reflexes and conditioned inhibitions are formed by the ordinary environment and by the training given by parents and nurse.

Conditioned Reflexes Formed Early.—Apparently the child can form conditioned reflexes at an earlier age than Krasnogorski seemed to suppose. Observation indicates this. Perhaps every mother can observe examples like the following. A child about a month old had been fed with orange juice from a spoon, and then at the mere sight of the spoon would open its mouth at once. Special studies also give evidence that for some things conditioned reflexes are formed at an early age. For some associated sensations they may be formed at birth.

In children one may often note the development of

conditioned reflexes by careful observation of incipient habits of speech, gesture, or the like. An observant mother notes that her baby reacted to the first stimulus of the bath by closing her eyes. Now at six months she always closes her eyes when she sees the ordinary preparation for the bath. The associations formed in connection with bathing and the like offer perhaps as good an opportunity for testing the child's ability to form conditioned reflexes as those formed in connection with eating. In a word, a child's motor learning, especially the learning of language, as admirably illustrated by Humphrey,[31] consists largely of the acquisition of conditioned reflexes.

The Mechanism of the Reflex in the Child.—The mechanism of the conditioned reflexes in the child varies from that of the animal in several respects. The first characteristic in the child is the extreme rapidity of its acquisition. In the case of the normal child, it is enough to let the effect of any stimulus occur in connection with the giving of chocolate or the like from two to ten times for the temporary association to be formed and for the associated stimulus to call forth independently the opening of the mouth. Further characteristics of the conditioned reflex in the child are the high stability of the association formed and the ease with which it is broken down. The newly formed conditioned reflex in case of a normal child lasts for a long time, but at any time it can be quickly broken up and again reëstablished.

In the case of a child, all the conditioned reflexes of the various kinds produced in animals may be produced and many others besides, apparently. The whole of the child's education from the early years is largely the development of conditioned reflexes from the stim-

uli of the environment. These are the reflexes especially significant for health.

The infant is conditioned to react to certain specific stimuli, certain sounds of the voice of the mother or the nurse indicating the time for nursing, the sight of certain places indicating the time for a nap, the sight of the bathroom and toilet indicating the time for the bath or the like, and later the sight of cup or spoon or the like indicating the opportunity for food or drink; and again the child is conditioned to certain forms of behavior by the petting or indications of favor and esteem of mother or nurse or playmates, and so on in a hundred ways. Still later, by the training of social groups, the child is conditioned to all the rules of the game—habits of politeness, the conventions of society, etc. Naturally the earliest and most important group of conditioned reflexes is developed in connection with the person and behavior of mother or nurse. As Kempf has expressed it: [38]

> The mother's voice, facial expression, color of hair, odors, eyes, skin, the shape of her mouth and conformations of teeth, her neck, bosom, arms and hands, touch and step, postural tensions, irritability and goodness, habits, ideals, and eccentricities, are all stimuli that come to have a potent autonomic-affective influence upon the child through being *frequently simultaneously* associated with the giving of nourishment, physical comfort, and relief from fatigue, loneliness, and anxiety. This continues as an almost incessant combination of stimuli, varying somewhat as the mother's affections (love, anger, sorrow, shame, pride, jealousy) determine her reactions to the infant (p. 76).

Unconscious Conditioned Reflexes

One of the most interesting things shown by the experimental studies is the fact that both child and

adult are unaware, for the most part, of the conditioned reflexes they have developed. The clearest illustration is that of a concrete reflex. Twitmyer's results give a splendid example. Until the fortunate accident occurred that produced the conditioned reflex in Twitmyer's experiment, the subject of the experiment was entirely unconscious of the fact that he possessed any such reflex ability. It was only the accidental circumstance of the conditioned stimulus of the bell occurring without the blow of the hammer that revealed the fact. So with the other observers in Twitmyer's later experiments.[66] None of them knew that they had potentially such a conditioned reflex until the experiments revealed the fact. Thus it is with hundreds of conditioned reflexes acquired from our environment or the like; we know nothing at all about them, and it is difficult to find out about them. As a result of special study some of them are discovered; but most of them probably remain unknown, although significant for our mental and physical health in spite of this unconsciousness on our part.

Children acquire great numbers of such reflexes, as pointed out by Watson and Kempf, but remain for the most part unaware of them. Much of their learning in the early years is of this kind.

Homesickness.—It would be impossible for any one of us to tell the influence in his own case of such conditioned associations. In order to test their significance and get some idea of their influence, it is necessary for the individual to be placed in a new environment and subject to different stimuli. To take an extreme case, suppose an individual is placed in such a different environment that nearly all the stimuli are new and unfamiliar. What will be the effect? It

is likely to be one or the other of two things according to the training and experience of the individual. For those who have had limited training and experience and have relatively few complexes of mental associations, what we call interests, the result is likely to be extreme homesickness. The feeling of familiarity and at-homeness that comes from orientation to familiar stimuli, is lacking; and without the customary conditioned reflexes one has that general sense of strangeness and emptiness from lack of habitual associations, that rather unique experience, which is recognized everywhere by the term homesickness. On the other hand, if homesickness is not the result of the unusual stimuli of the new environment, an excess of pleasure and exhilaration may result from the influence of the new stimuli and the development of new reflexes and new activities.

The extreme difficulty with which we can recall our own past experiences and the difficulty of tracing the genesis of any permanent conditioned reflex is obvious to any one who tries to trace this origin in himself or in others. Really it is an experiment worth trying to attempt a survey of one's own past history and present character and behavior and determine one's own conditioned reflexes and the cause of them. Usually the evidence for their genesis, if not for their existence at all, is very inadequate. In his own case, for example, the author finds few if any instances where the evidence is quite satisfactory.

Unconscious Reflexes Significant for Health.—Many of these conditioned reflexes and associations in the case of the individual child are active. Many more are, we may say, latent. To maintain that this great number of conditioned reflexes, of which a child is for the most

part unconscious, has a significant relation to the mental health and efficiency of the individual may seem far-fetched to most parents and teachers. For this view, however, there is interesting evidence from widely different sources.

First, the experience of homesickness just mentioned is common for children who have even what may seem, from an adult point of view, slight changes of environment. The significance of such changes for the health of the individual has often been shown in case of both animals and children. Homesickness in human experience is not infrequently a condition that seriously menaces the physical, as well as the mental, health. For those not in active service it made one of the most serious conditions in the camps of the volunteer and private soldiers during the War. In our Civil War under the insanitary conditions that caused such a large amount of illness, the danger to health was written in large letters in individual cases. Of the sick soldier under these conditions it was said that if he became homesick his coffin might just as well be provided.

Second, of the important contribution of such associated reflexes for efficiency, some evidence from the laboratory may be given. Stratton, for example, cites the following:[65]

Students were set by Dr. Brown the task of solving a series of problems, working day after day, all at the same series of problems. Half of the youths worked one at a time in a room neatly carpeted, orderly, bright, and with a cheerful outlook. The other half were required to work one at a time in a room with bare floors, dingy, chaotic with odds and ends of apparatus, well lighted from above, but with no outlook. Those who had the pleasanter surroundings greatly outdistanced their competitors. It encourages us to think that

schoolrooms, studyrooms at home, if made pleasant, give more than pleasure itself; they increase the work accomplished, the fruit of the effort.

Other significant evidence comes from the fact that adjuvant associations connected with the familiar situations of one's habitual surroundings and with regularity in one's work, are recognized as commonplace matters of everyday life. It is known, for example, that the baseball team is likely to do better on the home grounds. Experiment in the laboratory indicates the same. The experiments of Smith and Guthrie in learning nonsense syllables give significant illustrations of this:[64]

Ten subjects learned lists of ten nonsense syllables, and 72 hours later relearned the same lists sometimes in the same surroundings, and sometimes in different surroundings. Each subject learned one list in the laboratory and relearned in the laboratory, learned a second list in the laboratory and relearned out of doors, learned a third list out of doors and relearned in the laboratory, and learned a fourth list out of doors and relearned out of doors. In eight of the ten subjects there was greater saving in each case where relearning occurred in the same surroundings in which the first learning had taken place. Two subjects showed in one of their four series a greater saving where relearning had occurred under dissimilar conditions. An average of 11.4 per cent fewer repetitions were required to relearn in similar surroundings (p. 73).

Meumann found that his subjects showed an improvement of memory after an interval of twenty-four hours. Although it has been suggested that this improvement is due to the organization of a permanent memory, this better result, if it could be carefully analyzed, would probably be found partly due, as suggested by Smith and Guthrie, to the daily recurrence of conditioned stimuli.

Affective Reactions Conditioned.—Not merely the primitive emotions, but apparently all affective reactions, are easily conditioned by associated stimuli. This has recently been emphasized by Kantor.[87] He notes the universality of affective responses and their interrelation with other kinds of activity. In his view, "of all the reactions which we perform, probably the affective responses are the most easily conditioned." As illustration of the transferred feeling responses, he cites the case of the individual who transfers his affection to objects and persons associated with the loved person, "even including a whole family, nation, or race."

Kantor gives a good illustration also of the individual who, enthusiastic about some painting, may condition his affective responses by connection with all the artists of that school; and he rightly notes that much psychopathic behavior consists of the unadaptable conditioning of affective responses.

This conditioning of affective responses has always played a significant rôle in human behavior. The classic literature of ancient and modern times is full of examples. Perhaps no more familiar illustration could be cited than the Biblical example of Ruth pledging her loyalty to Naomi: "Whither thou goest I will go, where thou lodgest I will lodge, thy people shall be my people, and thy God shall be my God."

Obviously, a large part of a child's training consists in rightly conditioning its affective responses. Thus Humphrey points out that æsthetic education consists in associating the right stimulus with an artistic appreciation. The obverse of this is the development of aversions and disgust for the vulgar, the slovenly and ignoble, by associating certain stimuli with the attitudes of disgust and contempt. It is no mean part of

a child's education when his affective responses become conditioned by good music and works of art—by the chimes in the church-tower, classic paintings, the sunset, the ocean, and the mountains; when healthful feelings of dependence, sublimity, and reverence are aroused by the cathedral at Cologne, Niagara Falls, and the starry heavens above.

The Wider Significance of the Conditioned Reflex in the Child.—Thus a promising method of approach for the study of many aspects of child life is that of the conditioned reflex. This suggests the significance of the child's whims, petty aversions, idiosyncrasies and peculiarities of various kinds, the number forms, colored hearing, etc., etc. If we study such peculiarities, we find in many cases they were not matters of accident; the preference for colors, the various aversions, the fears and the like are often due probably to such trivial incidents as the fact that the child's mother at some time wore a red dress or blue dress, that the curtain in the child's room was green, or the bell used to call the child had a harsh or a pleasant sound.

The wider relations and wider significance of some of these things is obvious on reflection. After having developed accidentally such whims and peculiarities as the result perhaps of accidental conditioned reflexes, accidental association of ideas, and mental attitudes and emotional reactions, the individual comes to take his own peculiarities seriously, they acquire a certain sacredness to him, and his own habits of behavior are exalted into the best and even perhaps the only proper methods of conduct in given situations; and some even exalt these accidentally acquired peculiarities into principles of conduct, perhaps of education and of art. Between the accidental associations of childhood and

the law of inertia, which is universal, we have the means of explaining a large part of human behavior.

Problems and Questions

1. Give examples of conditioned reflexes you have observed in children.
2. Give examples of inhibitions that you have observed in children or adults.
3. Give examples of conditioned reflexes that you have observed in yourself, especially those produced by stimuli associated with biologically adequate stimuli producing fundamental reactions like those connected with eating, sleeping, and the like.
4. Give examples, if you have observed such in yourself, of conditioned reflexes or inhibitions produced by stimuli associated with the associated stimuli themselves, sometimes called conditioned reflexes of the second order, for example, those connected with table companions who have become conditioned stimuli.
5. What things did you learn easily as a child, what with special difficulty?
6. Report cases of children who find it difficult to unlearn.
7. Give examples of memory conditioned reflexes.
8. Report other experimental studies on delayed reactions.
9. Why is plasticity of the nervous tissue so important for education?
10. Give examples of conditioned feeling reactions in relation to works of art, literature, or the like.
11. Why are all such associated or conditioned reactions helpful or injurious to the health?
12. Make a summary of important points in this chapter.

CHAPTER V

THE CONDITIONED REFLEX: HYGIENIC SUGGESTIONS

THE contribution to hygiene from the study of the conditioned reflex is large. Not only does it give an objective point of view and method for the investigation of important and puzzling problems in hygiene, but its contribution in many phases and details of health has been important and manifold. This more concrete contribution may be illustrated by a number of more-or-less miscellaneous examples.

Hygienic Habits

Such conditioned reflexes and inhibitions are formed in the early years under the stress of circumstances and by the training of parents and nurses. Many of these, such as conditioned reflexes that favor cleanliness, are distinctly important habits of health. The young child soon learns, for example, not to void secretions at the direct stimulus of pressure, but only on occasion of associated stimuli—the customary place, and time, and the like. The processes of secretion and digestion are affected by such acquired conditioned reflexes. Some adults, for example, cannot have a proper movement of the bowels without smoking a cigar. In the case of others a definite time of the day is necessary. Many must have the customary surroundings, and as a result suffer from indigestion in the first days when on a

journey. There is great danger that undesirable and unhygienic habits may be formed by children.

It is hard to detect or trace the origin of these conditioned reflexes. Says Hough: [27] *

> The most frequent are probably connected with the large intestine and the bladder. Certain conditions which have no logical bearing upon the functions of these organs will regularly arouse them to inconvenient activity. A friend of the writer cannot mislay an article and begin to search for it without having an immediate awakening of the colon to energetic movement. On some occasion in the past there was probably a coincidence of the two circumstances and a cross-tie between two mechanisms has remained. Such a tie has undoubtedly an anatomic existence, though we do not expect to have it pointed out post mortem in the mazes of the brain. Outbreaks of perspiration in certain circumstances may be explained in similar ways.

The need of right habits here is none too strongly emphasized by modern hygienists. To-day scattered in sanitariums and health resorts thousands of adult sufferers from intestinal indigestion and nervous disorders, who have long been the victims of drugs and paid tribute to medicine, are trying to break the inhibitions of a lifetime and acquire those habits of health which they should have developed as children. It would have been easier and better to have acquired healthful conditioned reflexes and habits in the early years.

In the case of normal children with proper food and exercise and the drinking of plenty of pure water, the development of regular habits in ordinary hygienic conditions is all that is necessary. This rule, so largely and strangely neglected in this country, is, however, of fundamental importance.

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* References throughout this chapter are to the bibliography at the end of Chapter VI on p. 165.

Food.—The conditioned reflex is stronger and more permanent when frequently reënforced by the unconditioned stimulus. Inversely, the unconditioned reflex may be assumed to be stronger when reënforced by the conditioned stimulus. Thus the dog is likely to show a greater flow of saliva and of the gastric juices if meat is given in familiar surroundings with all the conditioned stimuli that this implies. So, too, with man, accustomed surroundings become conditioned stimuli and determine a better secretion of the digestive juices. Better digestion results in case of most individuals when agreeable companions are present furnishing conditioned stimuli. And with other individuals solitude may furnish conditioned stimuli that aid digestion. A vast number of accidental and accessory circumstances may become conditional stimuli—attractive furniture, beautiful dishes, flowers, views from the window, conventional serving, and so on. Hall has put this tersely as follows:[23]

> We eat more or better or both if the dining-room is illuminated and sunshiny, the walls artistically treated, the dishes, knives and forks, table-cloth, napkins, the personnel and attire of the waiter, satisfy us. Color standards are often prescribed for certain foods. So are forms and modes of serving. Flowers, music, song, help.
>
> People who eat alone, and especially those who cook their own food, are prone to eat less, with less mastication, more rapidly, with less variety, to become careless and irregular. Man is gregarious, and social converse at meals is one of the best of appetizers, while depression and a sense of isolation are keenest to those who are solitary when they eat. A few of these day-dream of imaginary companions and even set chairs for them, while more think of their friends. The health and spirits of a homeless girl who eats alone are in danger, and she is otherwise a pathetic object. Some young women in

our returns confessed that they ate better if there were one or more men present, that an enemy, critic, or other objectionable person might wreck a meal, and so might disputation or violent argument. Harmony, wit, humor, help both appetite and digestion, and converse with a friend is best of all.

Equally significant are the unfortunate conditioned stimuli which often result from improper food, bad service, lack of cleanliness, and the like.

Early Conditioned Reflexes.—In the case of children, naturally enough the earliest conditioned reflexes are likely to be associated with food; and thus the hygiene of the young child should have special regard to the development of normal and wholesome conditioned reflexes in connection with proper food and normal habits of feeding; special care should be taken to avoid unfortunate conditioned stimuli and abnormal habits of eating. Failure to do this results in the vast number of aversions and whims of children in regard to their food, which probably, in most cases, are so many unfortunate conditioned reflexes. In psychopathic children such idiosyncrasies and bad habits in regard to food are common, and perhaps are frequently causal factors introducing the mental or nervous disorder, as well as the results of it. Campbell has given many instructive examples.[11]

The child, however, has relatively few, the adult many, conditioned reflexes in connection with food. What, for example, is the difference between a child and an educated adult in regard to the simple matter of the eating of one's food? Humphrey has given us a simple illustration of this, as follows:[81]

It makes little difference to the hungry boy of six whether he eats his pudding on the floor or at the table, out of his not-over-clean pocket or from a silver dish. But when he is forty

years older, he may have become an epicure. His dinner must now be punctual, or his appetite is spoiled. The cloth must be clean, the lighting subdued, the service expertly deft, the table properly set with all the accessories of food well cooked and eaten in a seemly manner. There is a great difference between the eating of the little boy sitting on the kitchen floor and that of the epicure whose appetite is spoiled if he happens to have been given some one else's napkin. And yet a clean napkin is not part of the food. . . . When the bell has rung for dinner and the process is gone through of sitting at the table with the lights duly shaded, the knives and forks and other accompaniments of food properly arranged, and the napkin smoothed down in its right place, the mouth waters. The reaction to food has begun without the sight of food, by means of these other things that serve as conditioned stimuli for the food reaction. In other words, the wish for a meal consists of the hunger motive put into operation by the mechanism of the conditioned reflex or rather of a number of conditioned reflexes.

Drugs.—We may turn aside briefly to consider one of the trials and frequently one of the dangers of childhood, namely, the taking of medicine. With fond and ignorant parents the practice has been well-nigh universal. It is largely a curse of childhood that, like the blessings of rain and sunshine, falls upon the evil and upon the good, upon the just and the unjust alike.

In most cases of the diseases of childhood, with careful nursing a cure comes whether medicine be taken or not; but the stimulus of the medicine is applied simultaneously with the nursing and the processes of recuperation by which nature cures the disorder. Hence, naturally, the medicine often becomes a favorable conditioned stimulus. Thus, on the one hand, it is no wonder that Dr. Osler once suggested that the world would be better, except the fishes, if all the medicinal drugs were thrown into the sea; and, on the other hand,

it is not strange that many drugs, in themselves indifferent or even harmful, may constitute a significant factor in bringing about recovery.

Many studies of the effects of the more commonly used drugs made by many investigators in this country and Europe should be supplemented by further studies of the conditioned reflexes formed in connection with their habitual use. In case of the smoking of tobacco, for example, the beneficial effect found by many individuals and shown by the results of some of the experimental investigations, is probably due, perhaps in most cases, to the conditioned reflexes formed, favorable either to relaxation or to the concentration of attention.

Thus the evil from the taking of medicine is due not only to the drugs contained in it, but also to the ease with which conditioned reflexes are formed. The medicine becomes a conditioned stimulus for sleep, or digestion, or the like. With children there is danger that a drug habit, or, if nothing worse, a medicine habit, may be developed.

The instincts of children are usually wholesome, and as regards eating and drinking and play and sleep and the like, they are usually more nearly right than the overanxious parents. In hygienic matters an intelligent ignorance on the part of parents is especially desirable, and, unfortunately, this is precisely what is usually lacking. And even intelligent parents sometimes do the most atrocious things in the management of their children. Many perhaps can recall the decoctions of herbs and muddy mixtures they had to take in the spring of the year. Booth Tarkington has given a beautiful example, which, if it be not true, is invented with sound hygienic insight. "Penrod's Nervous

Breakdown" should be read and pondered by every fond parent.

Mrs. Schofield became anxious about the health of her boy Penrod. A neighbor told her about a medicine that she had given her own boy with good results. Mrs. Schofield procured it at the druggist's. She attempted to give it to Penrod. The boy rebelled and asserted that he was well. The father was called in; the boy was forced to take the dose. The medicine proved odorless and gave no warning of what it was about to do. In the case of Penrod the surprise was complete and the effect shocking. But the dose was two tablespoonfuls before each meal, and the feat of giving it to the boy was finally accomplished.

Presently Penrod began to feel dizzy, and his eyes refused perfect service. This was natural, because two tablespoons of the liquor contained about the amount of alcohol to be found in an ordinary cocktail. A boy does not enjoy the effects of intoxication. Therefore Penrod complained of his symptoms and showed himself so vindictive as to attribute them to the medicine.

"Bilious, too," his mother whispered to her husband.

Three doses of this alcohol mixture, which the mother was unwittingly using, were given. And then the boy showed a surprising readiness and willingness to take the medicine. This continued until two bottles and a half were taken; the mother noted improvement in her son, or, rather, perhaps forgot to worry about him; and after some ten weeks we find the boy playing drug store with his companion. To increase his stock of medicine he brings out the big bottle from which he had been dosed and the following conversation occurs between him and Sam Williams:

"What's all that stuff in there, Penrod," he asked. "What's all that stuff in there looks like grass?"

"It *is* grass," said Penrod.

"How'd it get there?"

"I stuck it in there," the candid boy replied. "First they had some horrible ole stuff in there like to killed me. But after they got three doses down me, I took the bottle out in the yard and cleaned her all out and pulled a lot o' good ole grass and stuffed her pretty full and poured in a lot of good ole hydrant water on top of it. Then, when they got the next bottle, I did the same way, and——"

"It don't look like water," Sam objected.

Penrod laughed a superior laugh.

"Oh, that's nothing," he said, with a slight swagger of young and conscious genius; "of course, I had to slip in and shake her up sometimes, so's they wouldn't notice."

"But what did you put in it to make it look like that?"

Penrod, upon the point of replying, happened to glance toward the house. His gaze, lifting, rested a moment upon a window. The head of Mrs. Schofield was framed in that window. She nodded gaily to her son. She could see him plainly, and she thought that he seemed perfectly healthy, and as happy as a boy could be. She was right.

"What *did* you put in it?" Sam insisted.

And probably it was just as well that, though Mrs. Schofield could see her son, the distance was too great for her to hear him.

"Oh, nothing," Penrod replied, "nothing but a little good ole mud."

Where the child is unable thus to appeal from parental nervousness to nature's wholesomeness, it is easy in the early years to establish undesirable conditioned reflexes by the use of medicines of different kinds, soothing syrups to put the child to sleep, the use of suppositories, and the like.

The problems involved in the care of children may well make one discouraged; but the one rule should be,

when we do not know what is best in the education of a child from a hygienic point of view, to let him alone. With our preconceived notions and the stress of convention, even this is a hard thing to do, as hard as it is simple. The feeling of most parents and teachers is that the least they can do in case of a child is to interfere, whether they know what to do or not.

This doctrine of laissez-faire for children as regards hygiene is likely to be deemed dangerous, because we are inclined to be omniscient in regard to the best training for children in ordinary matters concerning health and wish to direct them in our own way; but before we use powerful drugs we should at least consult some competent physician who, we may reasonably suppose, does know.

Sleep.—As observation and Pavlov's experiments alike show, any slight and continued stimulus tends to produce sleep. During the last ten or twelve years Pavlov has studied the relation between inhibition and sleep. He reports now that he has been forced to the conclusion that internal inhibition, as he calls it, and sleep are the same. In his experimental studies with dogs he found that after a conditioned reflex had been developed, and when in the course of an experiment a conditioned stimulus was acting alone, before the unconditioned stimulus, feeding or spraying the mouth with acid, was added, even though this delay lasted only from 15 to 30 seconds, during this time the animal became sleepy and often fell asleep. The sleep of this kind might be so deep that it was necessary to waken the animal in order to give him the food, this too, although the dog had had nothing to eat for nearly 24 hours.

The outstanding fact which Pavlov emphasizes is that every stimulus that falls on a definite point in the

cerebrum for a more or less prolonged time, of whatever significance for life, and even the more if it has no permanent significance, and however strong it may be, every such stimulus, if not accompanied by other simultaneous stimuli of some other point, or inhibited by other stimuli, leads inevitably sooner or later to sleepiness. The facts referred to prove that the conditioned stimulus which has its effect on a definite point of the cerebral hemispheres, although it may be connected with the most important stimulus of the organism, namely food, leads in spite of this to sleep, if it remains isolated for a time, even for a few seconds, without the simultaneous mass stimuli which cause the reaction of eating. No exception to this is found, unless the conditioned stimulus which calls forth the food reaction consists of a violent shock of electricity. Every uniform and persisting stimulus leads to sleepiness and sleep.

Inhibition as Localized Sleep.—If internal inhibition and sleep are one and the same process, how shall we understand the difference between the former and the latter? The question is solved simply and naturally by the following hypothesis. Inhibition is a partial, in a certain sense, fragmentary, narrowly localized sleep, inclosed within certain limits by the contrary process of excitation, while sleep is an inhibition which spreads itself over a greater area of the cerebral hemispheres or the whole cortex and even to the lower level of the midbrain. Now spreading of the inhibition occurs and then sleep occurs. Now the inhibition is limited and sleep disappears.

As experiments by Mme. Pavlov indicate, the reaction of sleep may be partial or it may be complete.[60] When it is partial, certain conditioned reflexes are abol-

ished and others are not. In an early stage motor conditioned reflexes may be present and the conditioned reflexes of secretion by certain glands may be absent; later the secretory reflex may be present and the motor reflex absent; and finally, in complete sleep both motor and secretory conditioned reflexes are inhibited. In waking the conditioned reflexes reappear in reverse order.

If, with Claparède,[8] we look upon sleep as an active process, the act of dropping asleep comes under the general class of reflex activities, and under certain conditions may become a conditioned reflex; or, as perhaps Pavlov would say, a conditioned inhibition.

In animals and children the biologically adequate stimulus that produces sleep seems to be primarily fatigue and perhaps certain other physiological conditions. Associated or conditioning stimuli that tend to produce sleep are varied and may be anything whatever. Usually an environment free from the more violent stimuli and darkness condition sleep.

In human beings it is no wonder that the conditions of sleep are complex and the individual differences great. Quite apart from inherited differences, no two individuals have the same conditioned reflexes and habits, because they have not had the same environment and training.

Few things are more important for one's personal health than the development of right habits in regard to sleep. Not only is it desirable that in early childhood healthful conditioned reflexes and habits be developed, but important that unfortunate reflexes should be avoided. As yet we know relatively little of the way these are formed; but it is easy to see how some of them are probably developed.

In case of some children it is not difficult to develop unfortunate conditioned reflexes in regard to sleep. Many children, for example, are trained so that they can not go to sleep unless there is a light in the room. It is quite as easy and more natural and healthful to train a child to go to sleep as soon as the light is removed from the room.

Fear of the dark may be developed in a number of ways. For example, as suggested by Watson, if it happens in a child's experience that just when he is left alone in the dark a loud clap of thunder occurs, very likely a permanently conditioned fear of the dark may arise, and likewise in regard to a number of other matters. If while a child is alone in a dark room, perhaps especially when first left in the dark, a loud noise of any kind, from the accidental falling of a window or snapping up of a curtain, or violent noises outside the room, or other violent changes of stimulation, from a possible accident to the bed, or any one of a score of the improbable things that do so frequently happen, occurs, an unfortunate reflex is liable to be developed. The same is true in regard to many other things in connection with a child's room and the situation when going to sleep or the like. The results of such unfortunate experiences appear strange and unaccountable because the causes are usually unknown and it is not easy to find out the situation that conditioned the fear.

A single concrete case may be cited. A little girl about a year old had been accustomed to sleep alone in the dark, to go to sleep at once, and never to cry. One day a friend visited the house bringing her own baby about the same age. The girl mentioned was sound asleep in her room. The visiting baby, a little boy, was placed in the same room to take his nap. The boy was

in the habit of crying and screaming when he woke up. Presently the visitor awoke and began to cry. The little girl awoke, was terrified by the presence of the new baby and its crying, and presently began to cry herself. In such a case it is fortunate if the little girl does not develop a permanent bad habit in connection with sleep from this single unfortunate experience.

A whole group of habits in regard to going to sleep are of fundamental importance, and to a large extent children can be trained to healthful habits by proper care. Of the conditioned stimuli which should become habitual in the production of sleep are, of course, darkness, a healthful posture, and perhaps the sight of a couch, and the sensations connected with closing the eyes, and the like.

On the other hand, the habits developed in many children of going to sleep in the light, and of dropping to sleep in a bad posture, or without proper arrangement of the clothing and the like, are bad. And further, the sound of the mother's voice or that of the nurse in singing, reading, telling stories, the dermal sensation from rubbing, patting, and the like, while desirable on special occasions, are of doubtful value from a hygienic point of view as habitual conditioned stimuli. It is much better that the child should become habituated to conditioned stimuli naturally and normally present in an hygienic environment, namely, darkness, the sensation from a suitable posture, and good air. Distinctly unhygienic are, of course, the various artificial stimuli, such as pacifiers, soothing syrups, the presence of a dog or cat or other animal, and toys of any kind that cannot be kept suitably clean.

Since the sensation from any receptor organ may become a conditioned stumulus, and this is probably true

for the reaction of going to sleep as well as for other reflexes, it is quite possible for many conditions to be helpful as adjuvant stimuli in bringing about sleep. Thus a man may be helped by smoking a cigar, by taking a light lunch, by reading a newspaper or reading what Oliver Wendell Holmes has called nightcap authors, not merely because they soothe the mind and bring about a mental attitude favorable to sleep, but also, probably in many cases, because such reading involves conditioned stimuli that become associated with the natural stimuli to sleep. Thus sermon and lecture may have an hygienic and hypnotic value, and in some cases be especially effective. It was the poet Southey, if I mistake not, who tells of his struggles with insomnia and the various devices to which he resorted—counting, repeating things learned by heart, the visualizing of an interminable flock of sheep jumping over a wall, or the like; but nothing was effective until he recalled his old lecture-room in college, the voice of the lecturer, and the sleepy attitude of his fellow students. This at once was effective, and so after many years he found evidence of the hypnotic value of lectures. Of natural stimuli one of the best is the neutral bath. It not only equalizes the circulation, but furnishes monotonous stimuli of the kind to produce sleep.

Individual Differences.—The tendency to fall asleep whenever the unconditioned stimulus was delayed was a serious hindrance in Pavlov's experiments. Hence he tried to get dogs that would not be so sleepy, and so chose animals that were very lively and active, that investigated everything, and reacted to everything; but he found these dogs just the opposite in character. In the situation mentioned they fell asleep quickly and easily. On the other hand, the dogs that were stolid,

and little active, but attentive, showed themselves especially fitted for the experiments; they did not fall asleep for a long time, even under the most favorable conditions. Similar individual differences as regards sleep occur in children and should be regarded.

The Bath.—In connection with the bath as a means of cleanliness, a great number of conditioned reflexes are likely to be formed in the early years. If healthful ones are developed and unfortunate ones prevented, then the stimuli become important factors in personal hygiene. After trying experiences involving overwork and strain, the effect of the wholesome conditioned stimuli of the morning bath is a wonderful tonic. Thus it is reported of one of our United States Senators that he would be up all night at a trying session, go home in the morning, take a bath and return fresh and ready for work.

The bath is important hygienically not only as a necessary means of cleanliness but also for the stimulation both direct and conditioned that it furnishes. Thus in normal children pains should be taken to associate pleasing conditions with the bath and to develop wholesome attitudes. The feeling of the little girl who said that she would rather be warm and dirty than cold and clean represents a natural attitude and one likely to be developed if care be not taken to give the stimulus of a cold bath in suitable surroundings, and when a child is in a condition for normal reaction to such a stimulus.

Clothing.—The influence of dress and ornament has often been noted and discussed by travelers and psychologists. While Carlyle perhaps describes this influence in exaggerated form, observers of primitive people and their ornamentation and dress, and students of the

psychology of childhood, have given much evidence of the importance of the associated stimuli from clothes and ornamentation.

Ordinary everyday observation, however, gives many suggestions of the significance of associated stimuli of this kind. Just as the primitive man does not feel ready for conflict with his enemy without his war paint and ornamentation as well as his weapons, so civilized woman, unless properly dressed, feels a guilty conscience, and so the business man feels lost and a definite lack, almost of a part of his personality, without his watch, his purse in the usual pocket, his glasses, his pencil, his pen, his keys, his knife, and, in many cases, a number of other implements. And the associated stimuli from these habitual accessories contribute a definite increment to the general sense of being properly clothed and equipped for the daily task.

Suitable clothing is directly important for health in providing healthful conditions of body temperature and the like. It is important also in providing optimum stimuli, unconditioned and conditioned.

The Hygiene of the Senses.—First of all, of course, the modern scientific knowledge of the hygiene of the sense organs should be regarded. In Monroe's *Cyclopedia of Education* the writer has given this briefly with important literature. But here, as in all matters relating to the health of the child and school hygiene in general, the point of view of the conditioned reflex should be taken; and even in such matters as visual defects or other sensory disorders, this point of view may illuminate the individual case. This happens more commonly perhaps in visual and auditory defects than elsewhere. A few concrete examples may be helpful.

The following is a typical case of astigmatism reported by Brav:[6]

Jan. 1, girl, aged 10 years, rather delicate and pale looking. . . . Child is always nauseated, is dizzy, has headaches and vomits every morning, often twice daily, changes color, turns white; sits down, the eyes roll upward, and the hands show convulsive movements. . . . There is no gastric pain, epigastric distress, or sensation of fullness in the epigastrium. . . . Full correction was given and the child was kept out of school for two weeks. March 20th the child was reported perfectly comfortable, with no attacks of vomiting, vision with glasses was normal, and headaches occurred only occasionally.

In such cases it seems natural to suppose that both ordinary and conditioned reflexes are involved. The removal of the abnormal stimuli by suitable lenses effects a cure.

Eyestrain.—Gould, in his *Biographic Clinics*,[21] presents the cases of Darwin, Huxley, De Quincey, Wagner, and other great men whose various physical troubles, headache, indigestion and the like, he attributes to eyestrain; and in case of a number of these men has made out a good case for his diagnosis. Without taking the extreme view which Gould does, and without considering eyestrain as the only factor in such cases, it seems pretty clear that in many instances conditioned reflexes are formed in connection with eyestrain, and the troubles such as Gould notes in the case of these distinguished men were, in part at least, due to conditioned reflexes formed. It is easy to see how this might occur.

If this theory be true, then we may have this cycle of events. First the excitement and enthusiasm and emotional stress of work, eyestrain caused by the errors of refraction, the discomfort of the eyestrain becoming as-

sociated with the emotional stress and excitement as a conditioning stimulus, the physical effects of the excitement (increased secretion of adrenalin perhaps) occurring directly at first, then later from the eyestrain as a conditioning stimulus without any excitement; then chronic indigestion with its accompaniments of so-called biliousness, dizziness, mental depression and the like, resulting from the increased flow of adrenalin brought about as a conditioned reflex to the eyestrain as a conditioned stimulus.

The Hygiene of the Ear.—In considering the hygiene of the ear we should note how easy it is to form conditioned reflexes to auditory stimuli. In many cases the extreme distraction and discomfort, or, on the other hand, the pleasure, which comes from certain forms of noise is pretty clearly due, in part at least, to conditioned reflexes formed. Many illustrations which are apparently examples of this are found in the literature. Some of these are the following:

It has been reported that certain distinguished men have required certain peculiar stimuli as conditions of intellectual work, varying from the beating of a kettle-drum resorted to by one English writer, to the habit of working under the pelting rays of the sun, attributed to another. Such experiences, as well as that of the ordinary writer who, to do his best work, feels the need of his favorite desk, or den, are probably due in part to the conditioned reflexes developed.

The biography of Mozart reports that he worked in a small room amid the noise of his children at play. He said that he was not disturbed in his work by this noise unless a separate individual noise occurred that attracted his attention, while the indefinite noise of his surroundings even had a stimulating effect on his activ-

ity. Lessing maintains that this is a typical experience.[45] He said that when journeying over the Russian steppes he noticed that one can sleep calmly in spite of the howling of a whole pack of wolves, but that the cries of a single hungry wolf are frightfully disturbing. His own extreme dread of noise, like that of Carlyle, can hardly be explained except as conditioned by the conditioned stimuli and mental attitudes developed.

A not uncommon experience is presented in the story of a man who went from the din of the city to his country home and found that the silence was so great that he could not rest. Accordingly, he would leave the house in the middle of the night and start up the engine which pumped the water for the house, then lie down in a nearby hammock and fall asleep to the lullaby of this hot-air engine.

Reflexes Both Favorable and Injurious

The number of conditioned reflexes developed in the ordinary everyday life of the child at home and at school is indefinite but very large. Some are favorable to the health of the individual and adjuvant to the tasks of the school and the home, some are unfavorable and unfortunately inhibitory in character. Those relating to the most commonplace occurrences are perhaps the most instructive. Why, for example, is it that odors affect some people so seriously? Why do certain apparently relatively indifferent sounds, or slight dermal sensations, a draft of air, or what not, affect some individuals? Why are some individuals affected so seriously by a slight change in the weather or change of location or the like? In regard to many of these things we may

find an explanation perhaps from the study of conditioned reflexes.

In regard to any of the conditions of life we may have conditioned reflexes that favor or that retard health; for example, take the weather. Apart from the direct influence of humidity, temperature, stimulation, or what not, perhaps in case of all persons, a group of conditioned reflexes are developed which largely determine the influence of the weather.

Every one has perhaps his individual reaction to weather conditions. Personally, the writer is rather susceptible to climatic changes. Bad weather is apt to cause more or less nervous disturbance, nervous pains and the like, what a few years ago would have been called rheumatism; but in case of a vigorous snowstorm this is largely offset by a distinct exhilaration which comes from watching the storm or being out in it. I am inclined to think this is due to a conditioned reflex or group of conditioned reflexes developed probably when I was a child and played in the New Hampshire snowdrifts or walked to school in the storm, since fortunately in those days we lacked any no-school bell. At least a pretty definite attitude tinged with pleasing emotion has been developed toward a severe snowstorm.

Every one has many such conditioned reflexes. To take another personal example, the writer has plenty of unhygienic habits, but one other group of conditioned reflexes developed in early life has been distinctly helpful and is distinctly hygienic, namely, the group of conditioned reflexes produced by the stimuli of a locomotive and a seat in a railway coach. I may start on a journey tired and nervous; but as soon as I am seated in a comfortable car I relax, the throbbing of the engine soothes me, the freedom from care rests me, and the motion

cheers me. This habit was perhaps acquired when a child. Like most children I was interested in trains of cars, and the like, and a wise mother never allowed me to be frightened by them. It is certainly much more hygienic for an individual to have such reactions on occasion of a journey than to have the dislike or fear of traveling common with many persons.

Aids to the Higher Mental Processes.—As regards the higher mental processes, the conditioning stimuli often become a condition of thinking. An interesting illustration of this is shown in the experience of many students. One student reports, for example, that in order to study effectively she must very carefully prepare her toilet and can go to work only after doing this. In the study made by Jones many authors and distinguished men reported that they did their best thinking and writing in a horizontal or semi-horizontal posture, or in some very peculiar posture.[34] The posture was probably to a certain degree a conditioning stimulus producing a conditioned reflex. All physical and military trainers recognize that one's posture is significant in conditioning the mental attitude and morale.

In a vast number of situations conditioned reflexes important for health are formed. How easily in some persons a conditioned reflex unfortunately significant in relation to health and comfort can be formed is illustrated by the following case reported by Haberman.[22]

An adult patient attended the opera on one occasion after a bilious attack. He held a seat in the first row of the dress circle. On looking over the balcony he became so dizzy that he presently had to leave. The week after, this time not bilious, he attended the opera again and, looking over the balcony, thought of his own feelings. Suddenly he "imagined" (thus he expressed himself) that he was again dizzy and really felt

so uncomfortable that he could not sit through the performance. This state of affairs continued until finally he had to give up this very desirable seat.

When such conditioned reflexes are formed in the early years of life, the individual is not likely to know their origin. Thus, probably, in most cases children, at least, are unconscious of such reflexes, and it is difficult to determine the cause. They account, however, in large degree probably for the whims, aversions, minor fears, and the like, that children have in regard to objects, places, animals, persons and the like.

Conditioned Reflexes of Other Glands.—The question naturally arises whether conditioned reflexes can be formed for the other glands in the body as well as for the parotid glands. Probably this is true, and perhaps for every gland conditioned reflexes can be developed. There is no reason to suppose that the salivary glands are unique in this respect. The direct evidence for the formation of conditioned reflexes for other glands is slight, but some important evidence has been obtained.

Bogen, for example, established conditioned reflexes for the glands of the stomach.[4] The remarkable study made by him is noteworthy. The case was that of a boy 3½ years old in whom a stomach fistula had been made and through which the child was fed during the process of cure. An associative experiment was attempted, and the result was reported as follows:

The child was fed a long time—in all over 40 times—with meat, while simultaneously a certain tone was blown upon a small trumpet. Other combinations were also used, the showing of food and blowing the trumpet, etc., and all these experiments gave positive results. Finally in ten trials of the blowing of the trumpet seven were followed by secretion and only three were negative. Anger and pain delayed the secretion, the

period of latency for meat was four and three-quarters minutes, for milk, nine minutes, and the secretion decreased as the intensity of stimuli decreased.

Conditioned reflexes can probably be formed for some at least of the glands with internal secretion. Especially does this seem probable for the adrenal glands. The experiments of Cannon have shown that while a football game apparently increases the flow of adrenalin, as indicated by the increased amount of sugar in the blood and the like, also the mere watching of the football game by those players who are ready for it, but not participating, has a similar effect. He reports his results as follows:[12]

Fiske and I examined the urine of twenty-five members of the Harvard University football squad immediately after the final and most exciting contest of the season of 1913, and found sugar in twelve cases. Five of these positive cases were among substitutes not called upon to enter the game. The only excited spectator of the Harvard victory whose urine was examined also had a marked glycosuria, which on the following day had disappeared (p. 75).

Apparently a vast number of conditioned emotional reactions, especially of fear, are developed in children. Their importance for health can hardly be overestimated. What relation these have to the endocrine glands is not clear, but clearly in large part they are not inherited but acquired; and their importance for health can hardly be overestimated.

Watson, as I understand him, accepts this view and has given much evidence to show that conditioned reflexes are formed in case of the endocrine glands whose function so largely conditions emotion. He says:

Conditioned reflexes are established not only in connection with the salivary glands, but with the more important digestive

glands of the stomach. While we have not been able to show it yet in our laboratory we believe that the ductless glands which are so important for the emotions are also conditioned in the same way.

Again Watson has reported his conclusion that conditioned reflexes are everyday occurrences in the life of the child and the adult, and thus many of the fears and peculiarities, idiosyncrasies of individuals, may be explained. They are, in a word, not the results of inheritance or instinct, but the products of training. He even comes to the general conclusion that "most of what we see that is bad in the child is the product of poor home and school training."

Hygienic Suggestions

While waiting for more evidence we should beware of hasty inferences; but we do have interesting suggestions. A conditioned stimulus will produce the secretion of the salivary glands in the dog's mouth. Pleasant surroundings increase the flow of the digestive juices in man. If we assume that a conditioned stimulus may also cause the flow of adrenalin, we can see then what probably may happen in concrete cases in our daily activity.

For illustration, take the following example. A man is obliged to do some very strenuous work, perhaps work that strongly arouses his emotions, immediately after dinner for several days. The emotional disturbance right after his dinner causes an increased flow of adrenalin; this checks the processes of digestion, and the same thing goes on for several days, and indigestion results. Here the emotional disturbance is the unconditioned stimulus, or, in other words, the ordinary biologically adequate stimulus. The secretion of adrenalin is the ordinary or

unconditioned reflex. Under such conditions conditioned reflexes are likely to be formed.

The man has had this emotional experience while sitting at his desk in his own office. Naturally enough, the situation itself, even the customary place at the desk and the familiar surroundings of the office may become associated with the emotional experience, or, in other words, become conditioned stimuli. In that case, after the emotionally trying situations have passed, this associated stimulus, the mere sight of the office, may produce the emotional experience, or perhaps the flow of adrenalin as a conditioned reflex. If this be true, then in such a case every time the man sits down at his desk, the sight of the office will stimulate the adrenal glands, cause an increase in the flow of adrenalin, which in turn will check the process of digestion, and thus the indigestion becomes chronic. Something of this kind seems to be what happens in certain cases; and the best means of cure is to take the man away from his desk for a few weeks.

In the case of a child, of course, the same thing might happen; any situation or any event might become a conditioned stimulus, stimulating the adrenal glands and causing indigestion. Suppose the child, for example, is punished by his teacher immediately after dinner, or merely scolded or laughed at; the emotional experience resulting may cause an increased flow of adrenalin and indirectly stop the processes of digestion, the schoolroom becomes associated with the emotional experience; and then, after the days of punishment or of reproof are over, the sight of the schoolroom itself may act as a conditioned stimulus and cause the indigestion, until every time the child enters the schoolroom he is affected in this way, and, as long as he goes to school, is ill. If anybody

wishes an hygienic moral here, it is not far to seek. A teacher should never punish a child or reprove one severely immediately after a meal, not merely because it is bad for the teacher's digestion, but still more because it is likely to cause the child to have indigestion.

Children should be trained to healthful habits in regard to all such important matters as eating, sleeping, and the usual activities of life, that is, healthful conditioned reflexes should be developed. For example, as it is more healthful to be social than unsocial, children should develop, in connection with eating, conditioned reflexes for society rather than for solitude as a conditioned stimulus. And, as Cannon has pointed out, our companions at table should be agreeable, and mealtime is not the hygienic situation for reproof and punishment.

Injurious Inhibitions.—Consider the inhibition of conditioned reflexes, and the significance of all this for hygiene appears still more emphatic. Pavlov, as we have seen, finds that almost anything whatever, a slight stimulus of almost any kind, is sufficient to inhibit a conditioned reflex. The same we may naturally suppose is true of the conditioned reflexes developed by the stimuli in our everyday environment. To take a concrete case: an individual rises in the morning on a pleasant day, all the favorable stimuli of sunshine, fresh air, and one's bath, the conditioned stimuli of an attractive breakfast and pleasant companions and the like, tend to favor appetite and digestion and put one in a condition of well-being or euphoria for the day's work. But if bad news, or domestic friction, or the like, occurs, these favorable reflexes may be inhibited and the individual goes to his daily work handicapped from the start. It has now been shown,[20] if I mistake not, that many of the accidents that occur in industry can be traced pretty di-

rectly to some trouble that occurred in the man's home, putting him in a condition unfavorable for his daily task. This opens up a wide and significant field in mental hygiene; but no adequate investigations have been made here, and this must be passed over.

Watson and Kempf are undoubtedly right in emphasizing the significance for education and health of the conditioned reflexes and habits formed in the early years. When we consider that the emotional reactions are so largely conditioned by the environment and training given in childhood, we see the health habits formed concern the most vital matters in regard to mental, as well as physical, health. Of course, the limits of health and the amount of strain an individual can bear within the limits of health are determined by heredity. What this is in case of any individual, we do not know. Probably some day standard tests will be developed that will enable us to determine more accurately than now what the potential health of an individual is. The problem of hygiene for the individual is to determine the limits of healthful development and efficient work set by inheritance, and then develop habits of health within these limits. The health of the individual should be the highest possible within the limits set by nature. In other words, the health quotient should be 100, and the practical problem is to determine what health habits to develop in order to achieve this maximum. The general contribution which the study of the conditioned reflex makes to health is the emphasis that it places on the conditioned reflexes and habits in relation to personal hygiene.

Hygiene has plenty of wise suggestions in regard to conditioned reflexes; but most men are deaf to her voice. They are more prone to seek the conditioned reflexes

developed by drugs or by doctors. Bad as the drug habit is apt to be, the paradox is true, nevertheless, that the more harmless drugs often have an hygienic effect because they act as conditioned stimuli for healthful conditioned reflexes. Better still is the assurance of the physician that one is in good health, which many of us need periodically. Best of all are essential conditioned reflexes and habits of health developed by training in childhood.

Preservation of Right Attitudes.—One other general rule of mental hygiene should be emphasized in connection with the details of school and home education. We should, of course, avoid destroying in childhood those attitudes we attempt with great difficulty to develop by reëducation in adults. The attitude of attention to the present situation, for example, is usual in childhood, an attitude the psychiatrist would give anything to develop in his patients. Why destroy in childhood what we must so often develop by reëducation in adult life? The child naturally begins each morning as a new day. We blame children for the past, we limit them in the present, we constantly warn them about the future. We cannot let them alone, but remind them of the faults of yesterday and warn them against the future; then, when by our continued prohibitions and corrections we have succeeded in developing conventional attitudes of so-called efficient and cautious activity, and all the usual inhibitions of prevision and worry, we take the adults who break down under this continued strain, put them in hospitals and sanitariums, and, in reëducating them, complain that they are always dwelling on the past, worrying about the future, and wasting their energy in unessentials.

The judicious will reflect also on the fact that, under

the guidance of wise physicians, a multitude of invalids to-day are trying to reactivate the wholesome impulses and attitudes of childhood inhibited by the anxious training of fond and foolish parents. Thus mental hygiene emphasizes prevention and would preserve from childhood at least some of the obvious essentials of mental health. Some of the more serious inhibitions carried over from childhood into adult life will be discussed in later chapters.

Problems and Questions

1. Give examples of healthful conditioned reflexes that you have observed in children.
2. Give examples, from observation, of whims, aversions, and idiosyncrasies in children, in regard to food or the like, that are apparently conditioned reflexes.
3. Report concrete cases where drugs used by children or others have become conditioned stimuli.
4. Have you ever observed a so-called habit, smoking, snuff-taking, or the like, where the pleasure, benefit, or injury derived, seemed to be due to conditioned reflexes?
5. Report examples from your own experience or that of others where conditioned stimuli are apparently an aid in going to sleep.
6. Report peculiarities in children in regard to the bath, toys, or the like, apparently due to conditioned reflexes.
7. Report any evil results, observed in yourself or others, from the persistence of unfortunate associations in regard to the weather, certain people, certain situations, or the like.
8. What seems to you the significance and danger of physical punishment in case of children?
9. Report any habits of posture, methods of study, places of work, or the like, that you have found specially helpful to you in doing mental work.

10. Report any other studies of the conditioned reflex or aspects of the subject that have hygienic significance.
11. What are some of the desirable mental characteristics of a healthy adult that we are liable to destroy in childhood?
12. Make a summary of the most important points discussed in this chapter.

CHAPTER VI

THE CONDITIONED REFLEX: CONCLUSIONS

THE extent to which associated stimuli and conditioned reflexes occur in everyday phenomena is hardly realized even by those who have made special study of them. Nearly all the multitudinous inhibitions also of daily life, slips in pronunciation, slips of speech, such as those recorded in the little German book, *Versprechen und Versagen,* all the forgotten memories—names of our friends, names of books, of places, of words that we wish to use and that constantly evade us—all the tantalizing memories that we know we possess, but that will not come when we need them, that are obviously in our minds potentially, but that we cannot recall merely because we always think of something else which inhibits the right memory—all these and many other similar phenomena, all the various inhibitions of activity—from the stammering in our speech and the halting in our action to the more conscious inhibitions from hundreds of superstitions and the like that paralyze straightforward activity—all such inhibitions, commonplace as they are, are examples of so many conditioned reflexes or associations of some kind. Thus the aim of mental hygiene to develop fortunate associations and to break down the manifold inhibitions that retard our activity, is one that concerns an enormous part of ordinary education and training.

The Importance of the Conditioned Reflex.—Probably

in every act of our daily lives conditioned reflexes are involved. Every habit is made up of conditioned reflexes. Every attitude and interest, too, probably involves conditioned reflexes. Thus learning consists in the formation of associations, conditioned reflexes, and systems of conditioned reflexes. Education is a systematic attempt to develop conditioned reflexes that signify normal adjustment to one's environment and efficient activity. In the regular performance of our daily tasks conditioned reflexes and habits should be formed that make for happiness and integration of the personality. The educational and hygienic significance of the conditioned reflex are equally great.

Think of the appalling complexity of the problem of the teacher who has to decide not only what stimuli should be associated with given situations to produce conditioned reflexes and what inhibitions should be developed, but also what inhibitions of unfortunate conditioned reflexes should be developed. The problem for the psychiatrist, in the matter of the reëducation of his patients, is often still more difficult because of associations that must be inhibited or unlearned.

The contribution of the conditioned reflex to education, mental hygiene, and psychiatry is fivefold: first, in giving an objective method for study; second, in showing the elements of one's problems; third, in showing the way to develop healthful associations and to avoid pathological ones; fourth, in saving one from many erroneous interpretations; fifth, in showing the significance of inhibition, and a method by which injurious inhibitions can be removed.

Conditioned Reflexes in the Training of Children

In the training of children, as we have seen, the de-

velopment of conditioned reflexes is quite as important as in the training of animals. And, on the functional side, the most important difference between the child and the adult is that the child is lacking in experience, its brain relatively free from paths of association, and the possibilities of development of conditioned reflexes and habits great. Again, the child has great ability for developing and for breaking down conditioned reflexes because of the plasticity of its nervous system. This apparently is quite apart from the fact that in childhood the field is not yet occupied.

Real Learning.—The significant thing is that the child at birth has the mechanism of the ordinary reflexes, but only vast potentiality for the acquisition of conditioned reflexes. This gives it its great capacity for learning. And it should be noted that real learning, in distinction from the mere performance of activities for which the neural mechanism is congenital, consists largely in the acquisition of such conditioned reflexes. Hough has put this very fittingly in contrasting such acquisitions as what we call learning to walk with the acquisition in learning to talk. The child cannot walk at birth because the neural mechanism which functions walking is not yet fully developed: but there seems good reason to believe that as soon as this neural mechanism is developed, as indicated by such studies as those of Kirkpatrick,[39] the child walks without any real learning.

It is very different with such acquisitions as that of learning to talk. There may be an inherited mechanism, and undoubtedly is, for making articulate sounds; but the learning to speak a particular language is a case of the acquisition of a vast number of conditioned reflexes.

Three Kinds of Learning.—There are, thus we see, three kinds of learning: first, is the acquisition of those

reactions for which the apparatus is congenital and inherited, such activities as learning to walk, the normal reaction of the fundamental organs of the body, suckling, chewing, secretion, and the like. Although we speak of learning to walk, strictly this is not learning at all, but merely the putting into action of these congenital mechanisms which the individual inherits ready-made, or which are partly developed at birth and complete their development with normal growth afterward. All these, however, are tremendously important for the health of the individual.

Second, is the form of learning which consists in the acquisition of temporary associations, the temporary conditioned reflexes. A great part of learning consists of this kind; the associations are formed merely for a temporary purpose, and are normally soon broken down to give place for others.

Third, is that form of learning which consists in permanent acquisitions. Such associations, as we have seen, may be acquired in two ways: first, by many repetitions of the association until the paths become permanently organized; and second, by a single intense initial reaction, or by shock, as we may say. The most important parts of our learning consist of these permanent acquisitions.

There is a significant difference between the temporary associations, temporarily organized conditioned reflexes, and permanent associations. What the difference is in the mode of acquisition which makes one temporary and another permanent we do not adequately know. Why, for example, should most of the associations and conditioned reflexes that the child forms fade out in a short time if not repeated, and why, on the other hand, should a remarkable sight, or the odor of the smoke

of a locomotive, or a factory or the perfume of a flower bring back after many years the memory of some definite scene and experience in childhood? Or why, again, should a single association of two events or two objects, remain so permanently impressed upon consciousness that no effort can eradicate the memory? The answer to these questions we cannot give, but the difference seems to be largely in the intensity of the initial reaction. A single intense nervous discharge apparently marks out a path in the nervous substance which may be more permanent than that formed by many repetitions of responses of less intensity.

Hygienic Aims in Education.—We come here upon some of the most fundamental problems of mental hygiene and of pedagogy. And we see here some of the aims of education from the hygienic point of view, among them the following:

First, the aim of education from the hygienic point of view is to enable the child's organism to acquire those fundamental organic reflexes necessary for normal health and development. For this end it is necessary in the early years that the child be protected from injurious conditions and that opportunity be given for the apparatus necessary for all such activities as the normal movement of the limbs, such as walking, and the normal reflexes of the digestive and secretory apparatus, the normal reflexes of the eye, and the like, to develop. In most cases all that is necessary is to let the child alone and protect from injurious influences.

The second aim of hygienic pedagogy is the acquisition of conditioned reflexes, or habits, if you prefer, essential for health. That is, the child in the early years should acquire those habits which represent the

alphabets of normal healthful activity both physical and mental.

The third aim of education from the hygienic point of view is the retention and preservation, so far as possible, of that plasticity of the nervous substance which makes possible not only the acquisition of conditioned reflexes, but also the breaking down of such reflexes, and the acquisition of new and perhaps more important ones.

From the results already obtained, it is apparent that perhaps the most deep-seated significance of stimulation and inhibition in the production of conditioned reflexes lies in their relation to learning, fatigue, and mental growth. Learning in the broad sense—that is, adjustment to a new situation—means the acquisition of responses to indifferent stimuli, and the association of stimuli and inhibitions in the production of a system of conditioned reflexes. It means the inhibition, or breaking down, of reflexes that do not prove useful. It means remembering and forgetting as well.

Brain Fatigue.—What is called brain fatigue, even though its chemical cause be the toxic products produced by functioning neurones, is perhaps usually due, as Krasnogorski thinks, to some general inhibition—that is, an inhibition so strong that it spreads over the whole cortex. To remove the fatigue, all that is necessary is a stimulus sufficiently strong to remove the cortical inhibition. The physical mechanism by which the removal of the inhibition is effected may be complex, involving the autonomic nervous system, the secretion of endocrine glands, and the like, but from our present point of view the essential factor in the process is the associated stimulus that inhibits the inhibition.

Plasticity.—Again, what we just now called the plasticity of the nervous tissue—the ability to form, to retain, and to break down temporary associations—conditions mental development. Without this plasticity, we have that arrest of development we call feeble-mindedness if it occurs before the age of fifteen or sixteen, dementia præcox, senescence, or the like, if it occurs after that age.

The different stages of decline in mental age, the arrests that occur in senescence, have not been systematically studied. But when an individual can no longer form and break down conditioned reflexes and habits (systems of conditioned reflexes), he is senescent, whether his chronological age be twenty-five or seventy-five. And one who can still form the temporary associations and adjust to the new situation is still young, though his chronological age be ninety. The mental age, not the chronological age, is significant in senescence as well as in adolescence.

The problem how this plasticity may be retained I am not able to solve. Its discussion would involve the study of other factors, such as the mental attitudes, infections, the proper functioning of the endocrine glands, and the autonomic nervous system. The significance of the mental attitude to mental health is suggested by everyday observation as well as by laboratory studies of the higher mental processes. The normal functioning of the autonomic nervous system has been shown to be vital and fundamental to healthful mental development. But all this is another story that cannot be told here. The writer's task is the far simpler one of suggesting some of the practical applications of a knowledge of association and the conditioned reflex in edu-

cation and mental hygiene. In addition to those already mentioned a few may be noted.

Practical Suggestions for Right Mental Training

How to Study.—Fortunately, the impulse to learn is instinctive. Directly in harmony with this real desire of children to study and to learn is the movement represented in recent years by many good teachers, by how-to-study books, and in concrete direction and guidance by teachers of the study of the pupils. This is an important movement, not only because it appeals to the strong interest of students who wish to know the best methods of studying and how they may best develop their own mental powers, but also because here there is great opportunity for conscious self-directed study and training, by adopting methods suggested from the point of view of the conditioned reflex.

Books like those on methods of study by Whipple in this country and by Starch in England, give excellent suggestions. Some of these are made still more significant by considering their value in the development of conditioned reflexes and systems of conditioned reflexes. Take, for example, the general instructions given by Starch for overcoming mental inertia and the natural dislike of active students to settle down to a hard grind, when it becomes necessary to leave the more active methods of the laboratory and the shop for mastering the contents of a printed page. The following are the general rules:

> If you have difficulty in overcoming inertia, just begin to go through the motions of work . . . sit down, take hold of book, paper, pencil, or whatever may be needed, and begin to write or read or figure. . . . This will automatically start the mental

process going relative to the work to be done, and before you realise it, you will be in the midst of the task, reading, thinking, and writing in an interested manner concerning the problems in hand.*

The psychology of the process is obvious. The accustomed place and time, the posture, the book, etc., act as so many conditioned stimuli to touch off in the first place the deep-seated impulse to study, and after a while this impulse is strengthened by habitual reaction.

Supervised Study.—Another important movement is that represented by supervised study, so-called. The idea of this is to give intelligent guidance and direction to students in their own study. Rightly regulated such work is of the greatest value. It requires the highest ability and psychological tact on the part of the one who supervises, involving a knowledge of individual interest, individual abilities, the need of freedom, of individual responsibility, opportunity for initiative, and a wide range of opportunity. Besides all this, to make the work efficient and helpful for healthful mental development, the teacher should study the whole work of the supervised class with regard to the development of right conditioned reflexes and right mental attitudes and interests. Here is the opportunity for most important investigation from this point of view; and only by such study is the teacher likely to gain the right attitude himself, to give the most helpful mental training, and even to avoid the traditional pitfalls that beset any supervisor who carries with him the traditional schoolmaster attitude and perhaps an unconscious antagonism to the pupils supervised.

* Cited by Adams. See No. 1 in the Supplementary Bibliography

Wider Relations of the Conditioned Reflex

Like Twitmyer's observer, one may have the association that makes a conditioned reflex possible, while as yet no situation has occurred for its appearance. That is, the conditioned stimulus, the stroke of the bell or what not, has never occurred apart from the biologically adequate stimulus, and thus perforce no conditioned reflex has occurred. What is the significance of such unconscious associations, such potential conditioned reflexes? This is an interesting question. No satisfactory answer is possible; but it is clear that an individual may have hundreds of such unconscious associations of stimuli, such potential reflexes. Hence the individual never knows, until tested, how he will act in a new situation. This has been illustrated over and over again in the case of the new recruits on the battlefield. The soldier who lacks experience never knows how he will behave when he first comes under fire, and, in general, no one can predict whether he will be a coward or a brave man in an actually new situation. The chances are good that whenever a new situation means a violent change of stimulation he will fill the rôle of a coward.

Symbols as a Source of Error.—Without forcing any analogy between the association of ideas and association of stimuli, it is noteworthy that the secondary ideas and feelings associated with those more fundamental are as imperative as conditioned stimuli themselves. Illustrations of this have already been given, but a noteworthy one in the field of education is the sometimes imperative influence of symbols in our thinking, especially in regard to educational matters.

One of the most common sources of error in the field

of education is from the association of symbols with things and with educational ideas. Certain words can stand for methods and processes as symbols of the thing itself. It is the same everywhere. The symbol is an economic device which saves a vast amount of unnecessary thinking; and after a time the symbol may be actually substituted for the thing with which it is associated, sometimes with grotesque results.

My friend's workman expressed his disapproval of daylight saving most emphatically. When my friend asked him how he liked it, he said: "I don't like it at all. The crops won't be good for anything, they need the morning sun." This naïve substitution of the symbol for the thing symbolized may not be quite so astounding in education, but it is the same mental process; and with the substitution of pedagogical terms as symbols for real things, we are liable to get an equally erroneous educational fallacy whenever this favorite practice of using the technical vocabulary of pedagogy occurs.

Unusual Phenomena in Children.—From the point of view of the conditioned reflex, we have a clue to some of the unusual behavior of children, which to the ordinary parent indicates unusual development, or perhaps the signs of budding genius; but is often more naturally explained by the law of association than by any mystical anthropomorphic inferences. Thus some of the remarkable answers, and still more remarkable acts of children, and signs of early reasoning, as well as some of the early memories of childhood, are cases in point. A single example may be given.

An English writer reports the case of a woman whose earliest memory dates back to the age of about a year and a half. At that age, while on a visit with her

parents, the child was given a ring to play with. When it came time for the visitors to go home, the ring could not be found. Search for it was in vain. Some months afterward the child with her parents again visited this home of their friend, and the child played in the same room. Almost immediately the child went to a corner of the room, lifted up the carpet and took out the ring; an example, as some would say, of unconscious memory. This apparently was a case of that form of memory involved in a conditioned reflex. The associated stimuli of the room and the carpet naturally produced the response of picking up the ring, and using it again as a plaything. In such cases the point of view of the conditioned reflex is a simpler one than any anthropomorphic explanation on the basis of unconscious memory or the like.

The Results.—The method of the conditioned reflex is relatively new and we have only begun to use it. Many problems are unsolved. The great care used by Pavlov and his students to control conditions has not always been taken by other investigators. The interest of some has centered more in the apparent philosophical significance of the results than in the objective facts. Naturally the results are sometimes in conflict. Hygiene is concerned merely with the facts obtained, not with the controversy between the introspectionists and the behaviorists, or with possible bearings of the results on idealistic philosophy. It welcomes the method of the conditioned reflex as an objective method that promises much in many puzzling problems. It eagerly awaits the results of further studies; but meanwhile it is obliged to make the best inferences it can on the basis of the facts already found. Although some of the concrete illustrations used to-day will probably with

more extended study be found erroneous, the main results are reliable and significant for hygiene, and the method valuable.

The Problems.—The work already done has suggested a vast number of subjects that may well be studied from this point of view. The method gives not only a new point of approach for mental hygiene and education, but also for many of the problems of industry, of sociology, criminology, and morals. The instincts, so-called, the feelings, emotions, and even the will impulses, may well be studied from this point of approach; and the psychiatrists have shown how largely conditioned reflexes, associated attitudes, and the like play an important rôle in every disease, especially in the neuroses and psychoses. In education every subject of study, every method, and the attitudes and interests developed in the school, may well be studied by this method. The manifold habits and permanent interests in connection with every occupation and situation of daily life can hardly be understood except as studied in their genesis from simple conditioned reflexes.

Even meaning itself has to be studied as a matter of association. Wheeler, in his study of synæsthesia, is led to the following general conclusions:[75] "(4) synæsthetic phenomena behave in such fashion that they can mean the fulfilment of a task; (5) meanings fail to develop in the absence of the appropriate behavior of synæsthetic colors; (6) synæsthetic imagery constitutes the context for meaning; (7) synæsthetic images operate as a substitute for feelings of familiarity; and (8) synæsthetic images 'label' or 'interpret' the 'object,' making it meaningful." And he seems inclined to the conclusion "that a motor response is necessary for the development of meaning."

Possible Applications of the Method.—The wider possibilities of this method, and the opportunity it affords for studying some of the unusual, bizarre, and mysterious phenomena of human behavior, are obvious upon a little reflection. Whenever something unusual and even something apparently supernatural occurs in the reaction of the psychophysic organism, it is well to approach the matter from the point of view of the conditioned reflex before resorting to speculation or invoking the aid of spiritualism, or occult theories of any kind that cannot be verified. There is space for but a single illustration.

Many remarkable cases of so-called dermographism and stigmatization have been reported. The witches of the Middle Ages were reported sometimes to bear the word Satan inscribed in red on their backs, and saintly mystics to have carried the sign of the cross inscribed on their foreheads, or the like. Richet, the French neurologist, has reported a concrete and modern instance of a mother watching her child, who, in play, accidentally unfastened the catch of a heavy sliding door in front of the fireplace and was in danger of being guillotined. In the fright and shock of the moment, there formed on the mother's neck, the part threatened in her child, a red weal that endured for several hours.

The tendency of the human mind is to look upon such phenomena as supernatural. The explanation of some of these cases, however, is obviously suggested by recent investigations of the formation of conditioned reflexes in the vasomotor field. These were carried out by Cytovitch [17] and others of the Russian school, apparently with great care to control conditions, and the results show that vasomotor changes similar in char-

acter to some of those reported can be produced in the laboratory as conditioned reflexes.

Humphrey, in a noteworthy paper in the *Journal of Abnormal Psychology,*[28] has attempted to show how largely the different Freudian mechanisms of transfer, symbolization, conflicts, and sublimation, may be explained from the point of view of the conditioned reflex without resorting to the usual theories of the unconscious. Although many will deem this explanation very inadequate, on the other hand, why need we resort to special mechanisms to explain those activities that are clearly explained simply by the ordinary principles of associated reaction in the production of conditioned reflexes?

One of the well recognized principles of science, so important in psychology and hygiene that it should be especially emphasized, is the rule accepted from the time of the Middle Ages that, in explaining phenomena, we should not multiply entities; and thus when a simple explanation by a well established scientific principle is supplied, why should the student confuse the issue by resorting to complex and speculative theories, however attractive these may be from their appeal to human emotion or from the high authorities that have advocated them?

Conclusion

The importance of the scientific method is fortunately recognized in mental hygiene as well as in somatic hygiene; and as regards the method of the conditioned reflex, the great advantage of it lies in the fact that with this method one's feet are on the solid ground of scientific fact while unusual and mysterious problems are studied. Even if at present one's re-

sults are meager, the student has at least the advantage, to his own personal mental health and to the healthful development of scientific hygiene, that comes from the use of scientific methods in any subject; and the results have a well established value because they can be verified by any competent investigator who can repeat the conditions. The question may well be raised whether one of the first important things is not to determine how far the problems of mental hygiene may be explained by a few of the very simple fundamental principles of scientific psychology.

The nervous mechanism of the conditioned reflex and the more technical aspects of the subject have been omitted. For the benefit of students who wish to read more extensively on the subject a brief résumé of some of the important points may be given.

Summary

1. Apparently, in a child as well as in animals, any stimulus whatever may become associated with another stimulus that occurs simultaneously.

2. Apparently any stimulus whatever associated with sufficient intensity with the original stimulus will produce the same response.

3. An unconditioned reflex is an ordinary reflex. In general terms, it consists in the transformation of a stimulus into a response.

4. A conditioned reflex is one brought about by an indifferent stimulus associated with the biologically adequate stimulus.

5. The physical basis for the association that produces conditioned reflexes is a process of neural excitation in the brain cortex. A stimulus coming in

from the periphery tends to associate itself with any area that is in a condition of stimulation. The significance of the method is that it is an objective means of studying what occurs in the brain cortex.

6. The brain and mind are active, not passive, in the response to stimuli. Just as in ordinary sense perception a process of selection goes on, so in the formation of conditioned reflexes a selective and differentiating process is functioned by the brain cortex. This is what is called by Pavlov and his students analysis. It is in substance sensory discrimination.

7. This analyzing function of the child's cortex may be greatly reduced on account of various organic and functional disturbances of the cerebrum. So, for example, Krasnogorski observed in the case of idiots and imbecile children that neither mechanical nor thermal nor contact differentiations were possible. Differentiations appear difficult in the cases of these children, and have an unstable and indefinite character. In this respect, the disturbances in taste and smell discrimination in case of rachitic children are noticeable.

8. Every excitation of a cortical structure tends to bring about the inhibition of others. The stronger the stimulation of one cortical area, the greater is the inhibition of others. The stronger the inhibition, the more extended are the irradiations of inhibition. In many nervous systems a moderate focus of stimulation conditions an extremely high degree of inhibition which irradiates extraordinarily quickly and broadly over the surrounding regions of the cortex. On account of this wide irradiation of the inhibition, and on account of the appearance of such intensive areas of arrest, naturally a more or less long-continued depression of the

whole cortical activity ensues. This reduction of the cortical activity we are accustomed usually to discriminate as fatigue.

9. This cortical fatigue is not exhaustion, but only the reduction of the cortical activity in consequence of a transient, but widely distributed, irradiation of cortical inhibition. A striking proof of this is the fact that such a general inhibition can be removed at any moment by any new external stimulation of sufficient strength.

10. Sleep is a general mode of arrest in contrast with other partial inhibitions.

11. Pavlov believes that by investigations of sleep one may find the solution of the phenomena of hypnotism and the like. If ordinary sleep is a general arrest of the activity of the higher part of the brain, we can consider hypnotism as an incomplete inhibition of various portions of the brain. Sleep and internal inhibition are the same.

12. The law of stimulation and *external* inhibition is briefly as follows: A new and different stimulus affects whatever process is active at the time. If this process is stimulation, it inhibits the excitation. If it is inhibition, the new stimulus inhibits the inhibition.

13. Conditioned reflexes, in contrast with the unconditioned reflexes, are unstable, temporary, always tending to die out if not reënforced by association with the unconditioned stimulus and subject to inhibition by any chance stimulus from the environment.

14. The child at birth is a paleëncephalic organism; the connections between the old and the new brain have not yet developed, and the individual is more helpless than a dog deprived of his cerebral hemispheres.

15. Very soon after birth, the process of connection of the old brain with the new begins, and the process of association making possible the formation of conditioned reflexes develops early, much earlier than most investigators, perhaps, have realized. The continued development of such reflexes marks the neural development of the child's brain and mind.

16. From psychological investigation, it appears also that the child's innate tendencies and native impulses are simple and his inherited tendencies generic and relatively few in number; so far as emotion is concerned, being, according to Watson, merely the fundamental emotional reactions of fear, anger, and love.

17. Apparently any stimulus whatever may become associated with the biologically adequate stimuli to these emotions and produce a conditioned emotion of the given modality just as Watson developed a conditioned fear in his boy Albert.

18. Although we can distinguish in phylogeny no dramatic beginning of consciousness, we may note that in a general way the ability to form conditioned reflexes marks a tremendously significant epoch in animal evolution. It signifies the advent of the cerebral cortex. It makes education in the higher sense possible. It is fraught with the weightiest possibilities of advantage or of harm to the organism. It means the possibility of education.

19. The education of the child is largely a process of acquiring in the first place conditioned reflexes, and then the more permanent associations and systems of conditioned reflexes that we call habits.

20. The great individual differences in children as regards learning are largely differences in the ability

to form and to break down associations and conditioned reflexes.

21. One important aim of education should be to preserve this plasticity of the individual which makes learning and development possible.

22. The conditioned reflexes in feeble-minded children are different in character; for example, the neural structure seems to be less plastic, and conditioned reflexes, once formed, are not easily broken down. A similar characteristic of the feeble-minded has been reported from observation. Such a child, once having learned a reaction or a habit, cannot easily change to a different one. This lack of ability to unlearn what has been acquired seems one of the distinctive characteristics of arrest of development.

23. In the acquisition of these conditioned reflexes during the early years of life, we have a record of the development of the special function of the neëncephalon significant for psychology, pedagogy, and hygiene.

24. When a conditioned reflex has been established, the original stimulus itself often seems to be reënforced by the associated stimulus.

25. The child is usually unconscious of the stimulus of the conditioned reflex, that is, the response occurs without his knowing why; likewise the child is usually unconscious of the reënforcement of the original stimuli by associated stimuli.

26. Conditioned reflexes may be removed, as they are formed: (1) by shock, that is, an intense stimulus that inhibits the conditioned stimulus; (2) by reconditioning, that is, by establishing an antagonistic conditioned reflex by many repetitions.

27. As regards its wider relations, the method of the conditioned reflex offers a means of studying objectively

the associative and inhibitory functions of the brain cortex and throws light on conditions of learning and fatigue.

28. In accordance with the general principle of science that we should not multiply entities, but should choose simple methods of explanation of nervous and mental phenomena rather than complex hypotheses, it is well to study the difficult and perplexing problems of mental hygiene first from the point of view of the conditioned reflex, resorting to other methods of approach later.

Problems and Questions

1. Mention some of the reasons why the work of parent, teacher, or physician is difficult.
2. Mention some of the different kinds of learning, so-called.
3. Mention some of the aims of education from the hygienic point of view.
4. Why does an individual never know how he himself will act in a new situation?
5. Report some of the practical rules or devices for studying that you have found helpful in your own case.
6. Mention what you think are the advantages of supervised study.
7. What are the earliest memories of your own childhood?
8. Do you think of any superstitions that could be explained from the point of view of the conditioned reflex?
9. Do you think of any problems not mentioned here that might be studied by the method of the conditioned reflex?
10. Mention cases of school children that you know where conditioned stimuli connected with the school or school work have proved beneficial or injurious.
11. Report any studies or observations of conditioned reflexes that you have read or learned about from reliable sources.

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CHAPTER VII

HABITS, OR SYSTEMS OF CONDITIONED REFLEXES

A conditioned reflex, as noted above, may be looked upon as the element in what is loosely called habit. A habit is a system of conditioned reflexes, but the former word is a loose and general term, and the term conditioned reflex is more definite. Thus, Watson says: "The term conditioned reflex does not make the word habit superfluous. Habit is a series of conditioned reflexes. The conditioned reflexes are the units into which all habits may be resolved."

The Formation and Permanence of Habits

Some, however, would avoid the term conditioned reflex. Thus Dr. Max Meyer writes: [22]

Inasmuch as "conditioned reflex" is a clumsy term and could be tolerated only if we had no better term, we shall not use it. No serious objection can be raised against the old-fashioned term "habit." Literally habit means a garment; then also a form of life, a mode of conduct, not naturally grown out from the body, but put on it from without, so to speak. As in our example, habit has always in the usage of language signified the exchange of components among two stimulus-reaction functions, except to loose thinkers to whom it may never have meant anything definite. If any student has the habit of thinking of a habit of conduct as a sheer mystery, then he should be advised to clarify his thought by using the term

"conditioned reflex," which would constantly remind him of the fact that no habit can be put on an animal except one whose sense function and motor function have already, in other combinations, been given to the animal by Nature. He who realizes this fact that "habits" cannot be created out of nothing, but only of "reflexes," need not use the inconveniently long expression "conditioned reflexes" (p. 119).

The fact that practically all students and teachers do need to clarify their thought in regard to the significance of the term habit and the rôle of habit in human behavior, makes it desirable in mental hygiene at least, whatever the fact may be in psychology, to use the term conditioned reflex, and to emphasize the fact that habits cannot be created out of nothing.

Habit a Generic Term.—Thus habit is a generic term used rather loosely for any customary reaction. The line of distinction between habits and conditioned reflexes is not clearly marked. Although habits are systems of conditioned reflexes, theoretically all conditioned reflexes are potential habits. Strictly, habits are conditioned reflexes at the outset. But we use the word habit in a loose sense referring to many instinctive reactions or to those developed pretty directly from the instinctive reactions as well as to more artificial responses like the conditioned reflexes. Again, habit usually connotes reaction tendencies of a rather stable and permanent character; conditioned reflexes are usually unstable and often temporary in character.

Although special attention should be given to the scientific studies of the conditioned reflex, it may also be an advantage to consider some of the more obvious aspects of habits or systems of conditioned reflexes from the ordinary point of view and to use the more familiar terminology.

The Formation of Habits.—The genesis of habits is similar to that of conditioned reflexes. Thus habits, like conditioned reflexes, are formed by repetition, or by shock, that is, by an intense initial reaction. A habit again may be broken in two ways: first, by substituting by repetition another habit antagonistic or compensatory; second, by setting up a new response by an intense initial reaction, that is, by shock. In both cases often the old habits are merely repressed and coexist with the new. The genesis of mental habits is much the same. A permanent association may be formed by many repetitions or by a single intense association, usually by repetition.

The Permanence of Habits.—How, one may naturally ask, does there develop from conditioned reflexes so temporary and so unstable, habits that are so permanent and so imperative in their character? We get at least suggestions of an explanation from the study of conditioned reflexes, and further experimental studies are likely to give additional data.

First, the conditioned reflexes themselves are sometimes permanent and stable when the initial association is intense or, as we may say, the result of shock. If, as we have noted, a young horse has an unfortunate association with a particular location, or some special moving object, whether animal or steam cars, automobile or bicycle, the association is likely to remain imperative. Thus in the training of animals a mistake on the part of the trainer is liable to spoil the animal. The maxim for the training of animals is always the hygienic precept of prevention. It is easy to prevent unfortunate associations, very difficult to remove them.

It is the same with children. The carelessness of the parent, the mistake of a poor teacher, or an unfortu-

nate situation in the child's environment, is always likely to make a permanent association with lasting injury. Whereas in case of the animal we blame the trainer, in case of the child we are apt to defend ourselves and say that the child was defective, had an unfortunate heredity, or was defective or feeble-minded. Both in child and animal plenty of the conditioned reflexes occurring from one's environment remain permanent after a single intense initial association.

Again, if, as not infrequently happens, the shock causing the intense association is followed by many repetitions, then there is two-fold reason for the permanence of the conditioned reflex or the mental association. Since children delight in repetitions, and especially are apt to repeat associations that were strongly emotional in character, this accounts for a large number of permanent conditioned reflexes and mental complexes.

The older writers were impressed with the significance and irretrievable character of an individual's habits. As James used to say, after a certain age, after the early twenties for most men, one's habits are definitely and permanently formed, only along the same old lines can new habits or even new thoughts occur, one can no more escape from these habits than one's clothes can fall into a new set of wrinkles. In other words, the individual is a slave of his past, physiologically the day of judgment has come. Although modern studies indicate that habits and associations are no less permanent and imperative, they do furnish suggestions in regard to the genesis of such habits and at least the possibility of the development of new habits to function vicariously in place of the old. Concrete examples of the development of series of conditioned reflexes, on the one hand, and of association complexes on the other,

in the case of young children, can be found by any one who will takes pains to observe carefully the behavior and development of children in any situation whatever, whether natural or artificial. As an illustration of a complex of associations, in its process of development under the influence of both shock and repetition, the following is interesting.

The Genesis of a Conditioned Reflex and an Association Complex.—A boy 22 months old was left to be cared for by a neighbor, while the mother was away, on a stormy day in April with high winds and driving snow. The neighbor went to the store taking the child. On the way home the boy saw a horse slip and fall. He was extremely interested, to the extent that the neighbor was obliged to face the storm with the child and watch men take the harness off and lift the horse up. When the father returned for the evening meal, the first thing the child said was: "Horse fall down." The neighbor explained the circumstances and said that the child had repeated these words at least three times during the afternoon. For several days the child repeated these words at least fifty times a day. The father noted the nascent obsession and thought these words should be replaced by some other phrase or at least modified; and thereafter whenever the boy repeated the words, the father added: "Yes, horse fall down, but man picked it up." Several days later, when the mother returned, the first greeting was: "Horse fall down." Gradually the child added: "but man picked it up." This addition was emphasized every time the child repeated the words. Also whenever the child saw a picture of a horse in a magazine, he always said: "Horse fall down," and a picture of an automobile breaking through a fence and dashing into the

river called forth the words: "Autobile fall down," and any picture that could be interpreted in this way was explained as "fall down." Even when a team passed the house the child said: "Horse fall down." Every time he said this the parents emphasized the words "man picked it up." A neighbor showed the child a comic section of a newspaper and talked about "Uncle Munn." The child added this to his horse complex and said: "Uncle Munn picked horse up." The child still continued to say: "Horse fall down," but only perhaps once or twice in several days, and now usually adds: "man picked it up." At first these words were uttered in a doleful tone, but now in a matter-of-fact way.

Prevention of Unfortunate Complexes.—A case of this kind is representative of thousands of experiences in the child's life. Things indifferent to us are liable to be of intense interest and the occasion of extreme emotional excitement to the child. And these occur in the most commonplace activities of the busy street or in the most peaceful phenomena of an ordinary country environment. Anything whatever, commonplace or banal to us, may thus be the occasion of excitement to the child. Again we see here the strong tendency of childhood to repeat over and over again whatever is interesting and exciting. The wise precaution of the parent in this case in attaching a wholesome association to the depressing one of the fallen horse may have saved the child from an unfortunate obsession and fear. For one case where we know about the experience, in a hundred perhaps we are ignorant of the facts. But the parent or teacher can save a child from many obsessions and unfortunate complexes.

Unconscious Habits.—To the layman habits are certain very obvious things that we are quite well aware

of and whose character we know whether good or bad. This is strictly in contrast with the view of the psychologist. To the psychologist habits are in large part forms of reaction of which we are unconscious and of which we can become aware only by some special test or some unusual experience; and as to their character, whether good or bad, this is usually a relative matter. We have definite groups of habitual reactions for the various familiar situations of our lives and for our usual activities—a group of reactions for the rooms in which we work, for the doors through which we pass, for the streets along which we walk, the vehicles in which we ride, for the people we meet, for our sitting, our walking, our eating, our sleeping, our dressing, our speaking, and singing, and even for the things we see and remember, and for the thoughts we think. Of many of these we become aware only by experiment or in unusual situations.

A Group of Habits for Every School Subject.—Especially significant for us are the groups of habits in the different scholastic processes, habits of reading, of adding, of writing, etc., as well as the various habits of preperception and association involved in our permanent interests.

Each scholastic process represents a group of habits. In the New York Teachers' Monographs an attempt was made to give an illustration of the habits of the school; but unfortunately the teachers considered merely the grosser and more superficial groups of habits and were unable to analyze these into the separate habits of which they are composed. It is only by trained introspection and by experiment that it is possible to analyze and determine more concretely the elements in these groups of habits. Take, for example, the train-

ing in arithmetic. All this represents a very important group of habits. Some of these we can detect by experiment. For a single illustration, take the suggestive results of an experimental study. Do we add upward or downward?

Cole found that twenty-nine out of thirty persons selected at random had the upward adding habits, one the reverse.[6] Very few of them had an introspective knowledge of their habit of adding upward, and many of them thought that they could overcome the effect of habit by attention. Tests of rapidity and accuracy indicated that this general habit of adding conditioned more subtle habits of perception and association.

A Hierachy of Habits.—Habit in its simplest form is a simple sensori-motor coördination, but in any skillful act we have also complex or integrated groups of coordinations. We are likely to have also associations with the sensory stimuli to these motor coördinations, and reactions to these, that is, conditioned reflexes. The learning of any accomplishment or the acquisition of proficiency in any school subject or the like involves also the formation of a hierarchy of habits. This has been admirably illustrated by the studies of Bryan and Harter,[4 5] in the learning of the telegraphic language, and by Book,[2] Swift,[26] and others, in their studies of learning. The views of what constitutes a hierarchy of habits differ. Bryan in his classic study of the learning of the telegraphic language described it as follows:

> A hierarchy of habits may be described in this way: (1) There are a certain number of habits which are elementary constituents of all the other habits within the hierarchy. (2) There are habits of a higher order which, embracing the lower as elements, are themselves, in turn, elements of higher habits.

and so on. (3) A habit of any order, when thoroughly acquired, has physiological and, if conscious, psychological unity. The habits of lower order which are its elements tend to lose themselves in it, and it tends to lose itself in habits of higher order when it appears as an element therein.

Proper Sequence in the Acquisition of Habits.—These studies show that it is important to follow the right sequence in the acquisition of the hierarchy of habits involved in a given subject; in other words, some habits should be acquired before others. This general law is not a mere empty statement of what we all know, but it opens a wide field for investigation of the utmost importance. The problem for pedagogy is to determine the proper sequence in the acquisition of habits in any subject. Careful and painstaking investigation is required to determine this; and in every subject of the curriculum there is good opportunity for such research, for our practice is based merely upon the empirical results of experience—good enough, perhaps, in many cases, and yet very erroneous perhaps in others. The study of the actual processes of learning different subjects is a very fruitful method. Bryan found results that led him to conclude as regards the telegraphic language: "(1) that by no device is it possible to gain freedom in using the higher language units until the lower have been so mastered that the attention is not diverted by them; and (2) that it is, nevertheless, wise at all stages to practice with the highest language units possible, and thus learn all the units in their proper setting."

It is of special importance that the elementary habits formed be propædeutic or preparatory to the higher and more complex ones in the given hierarchy. And here our guide must be the laws of development both

physiological and psychical. Thus in the physiological development, as already noted, the larger, more fundamental, or more central, nerve centers in a given physiological series are developed before the more accessory and peripheral. Hence, for example, since the nerve centers that control the muscles of the shoulder and arm are developed before those controlling the finer muscles of the hand and fingers, the order of training should conform to this sequence. The motor habits developed by the use of arm movements in making lines and ovals on the blackboard are propædeutic to the habits of finer coördination involved in ordinary writing. Scribbling, a natural stage of manual activity, is propædeutic to writing.

It is obviously essential for hygiene that this natural sequence in the development of habits of skill should be followed. Much investigation is needed here.

It is the province of experimental pedagogy to work out this sequence for each special subject of instruction. In like manner it will be necessary in the new science to be developed in the not distant future, the science of experimental ethics, to work out the proper sequence in the development of moral habits. The tremendous importance of this is emphasized by the modern studies of Freud and his school. Its significance for hygiene is obvious when we consider the danger to health from premature and unrelated forms of moral development.

Automatization

Thirty or forty years ago up-to-date writers on education talked impressively about the advantages of making as many as possible of the activities of daily life and of learning automatic, intrusting them to the safe and sure functioning of the lower centers and the spinal

cord, so that the higher centers of the brain might be free for higher and more important matters.

No Transfer to Lower Centers.—The value of automatism is undoubted, but the possibility of transferring as the result of practice the functioning of an activity from the higher centers to the lower does not seem to be shown. No adequate evidence of this was ever given. It seems to have been assumed on the basis of an accepted theory of automatization. Recent studies of learning in white rats made by Lashley show that even with repetition a thousand times visual motor reactions are not transferred from the cortex to lower centers; for example, removing the visual center in animals that "were trained in the habit of visual discrimination and were then given additional practice for 1,200 trials, destruction of the visual area resulted in loss of the habit." Thus long training does not transfer the habit to subcortical centers, but it must be functioned, if at all, by a conditioned reflex arc.

Nature of Automatization.—In case of kinæsthetic motor habits that are functioned by the lower centers this subcortical character was determined at the time of learning. If, at the time of learning, the functioning was by an ordinary reflex arc through the lower levels, it remains such; if at the time of learning it was a conditioned reflex arc, or cortical, it remains the same. Thus automatization, whatever its neurological basis may be, is not to be explained by transfer from higher centers to lower. Lashley puts the matter as follows:[16]

> If long-practiced habits are not reduced to subcortical levels, what is the neurological basis of automatization? The musician may not speak when first learning a difficult movement, but later his verbal reactions are dissociated from the manual

coördinations so that the two processes may go on simultaneously. It is this capacity to function without exciting reaction systems other than those directly concerned with its performance that characterizes the automatic habit. Such a condition might be brought about by blocking cerebral associative connections, and this seems to be the only alternative to reduction to subcortical levels. An analogous situation is presented by the differentiation of the conditioned reflex to a specific stimulus (Bechterew, '13). Whether the confining of impulses to a single path is the result merely of repetition or of some active inhibitory or blocking process can not be decided from existing evidence (pp. 467-468).

The Economy of Habit.—The economy of habit has often been pointed out by James[14] and many writers since his time. We should make as many useful acts as possible habitual and automatic. All acts of this kind are performed with the minimum expenditure of energy.

Whenever we have to think what to do, whenever we must give conscious attention to an act, energy for both the thought and the act is required. When we perform an act automatically, energy for the act only is required. Fortunately, according to the law of parsimony, consciousness tends to desert those processes where it is no longer needed. This dropping of all supernumerary consciousness not only saves energy, but insures security of performance; for it is a matter of everyday observation that we make no mistakes in those coördinations which have become automatic.

Habit makes it possible to perform the same operations more easily. The nervous mechanism seems to be the same for the habitual act as for the initial response in learning, but it runs more smoothly, and unessential processes are eliminated. As Pike has well expressed

it, habitual acts are performed with a minimum of afferent impulses, a minimum of attention

It would be easy to show the enormous advantage of making all the mechanical processes of life and of learning, such as the mechanics of reading, writing and the like, habitual, so that energy may be saved for higher and more important and more difficult matters. This is all true enough and tremendously important—but there is another side to the matter.

Habits of Error.—A great part of our so-called education for many persons consists in the organization and automatization of habits of error as well as correct habits. The result is that the saving from habit is purchased at the expense of accuracy or else is offset by waste from interference of association.

Habit is a good thing when the correct processes are made automatic, and may be a very bad thing when both correct and incorrect and unessential processes are fossilized into habit. The tragedy of school education is that so much of the time is spent in the repetition of things partly erroneous.

Of course, the important pedagogical principle is to take pains that all habits formed shall be of such a character as to be propædeutic to habits of a higher order, that they be habits that may fuse either in whole or in part in the organization of the higher and more complex habits.

Fernald in the school for the feeble-minded at Waverley has, I understand, worked out a program for the education of the feeble-minded distinctly with regard to the pedagogical sequence of the occupations. Not only is the attempt made to have each occupation adapted to the stage of development of the defectives

to be trained, but also to have all the habits involved in the different motor occupations propædeutic to the occupations that the children will take up later on. Of course, it is much easier to do this in the case of the feeble-minded than in case of normal children, because their development is permanently arrested, and when once the diagnosis has been made determining the stage of development on which the pupil stands, all that is necessary is to work out a series of motor exercises for that particular physiological age so arranged that each shall be propædeutic to those that follow. Although it is more difficult to adopt such a plan among the normal, so far as possible this should be done, and the teachers of the public schools could learn much from studying the methods adopted for th feeble-minded.

We can, at least in the teaching of normal children, avoid the teaching of positive error and direct training in erroneous habits. We are yet in our practice far from doing this. The custom of giving errors to be corrected, of covering the blackboard with misspelled words, mispronunciations, barbarisms, solecisms, and improprieties to be corrected, and especially the presentation of any erroneous form of pronunciation or of other motor accomplishment is always a doubtful method.

Unlearning.—The rule, then, is to avoid all erroneous reactions and to make all habits that are formed propædeutic to habits of a higher order. But a moment's reflection shows that, however desirable all this is, and however necessary it is to strive for this ideal as much as possible, no one but omniscience could devise a program that should perfectly conform to these

principles, and only in a pedagogical Utopia would it be possible to shield children from forming erroneous and conflicting habits. Hence we see the need of breaking habits. Although theoretically this may not be possible, and every habit broken down probably leaves its trace in the neural mechanism, nevertheless for practical purposes it is true that we can break up habitual forms of reaction, and the ability to do this is the mark of health and sanity. Hence it becomes almost if not quite as important to study methods of unlearning as to study methods of learning. Let us consider this subject for a moment on the different levels of habit.

As shown by the method of the conditioned reflex in the experiments by Krasnogorski,[10] the characteristic of the thoroughly normal child is the ease with which the conditioned and memory reflexes are broken down. In the case of the defective or neurasthenic child the conditioned reflex persists after the desirability of it has ceased, and only with difficulty is it broken down. One of the obstacles in educating the feeble-minded is that it is hard for them to unlearn.

In case of certain neuropathic children the breaking down of such conditioned reflexes occurs very slowly. For example, in case of a five-year-old child of this type with whom a conditioned reflex upon a dermal stimulation had been relatively quickly formed, the stimulation had to be repeated without the accompaniment of the usual stimulus, the giving of chocolate, thirty-one times in order to destroy the reflex. Such a defect is looked upon as indicating serious disturbance of the cortical activity, the brain lacking in this case the power to break down useless associations.

Again in the learning of various kinds of skill, type-

writing, and the like, experimenters have found that the ability to become expert, or, in other words, the ability to acquire the higher order of habits depends largely on the ease with which one can break down the habits of a simpler and lower order.

Plasticity and Its Relation to Habit.—The plasticity of the nervous system, already referred to, should be considered here in relation to habit. Apparently there is a striking difference between the child and the adult in regard to the forming of new habits. The studies of Krasnogorski,[15] already noted, indicate that at least the incipent habits of association are readily broken down in the normal child.[15] Something of this plasticity it seems possible to retain in later years. Health, efficiency, and moral character all depend largely upon conserving this.

The true moral autonomy consists, not in following the alleged dictum of Rousseau, to form as few habits as possible, nor in any Utopian selection of the habits to be developed, in any Spencerian or Sunday-school perfection of conventionally good habits, but rather in the ability to break down any habits that are formed and make adjustments to new and changing situations and to acquire methods of thought and action of a higher order. Bernard Shaw is reported to have said that hanging should be the punishment for anybody who attempts to say how another individual should be educated. But the real moral and intellectual homicide, which perhaps he had in mind, is not that of imposing a hierarchy of habits upon other individuals so much as the crushing out of adaptability, the power of breaking up old habits and forming new ones; this is the real arrest of development; this is the funda-

mental danger also to the mental health. Plasticity, adaptability, and adjustment mean youth, sanity, and mental health. Habituation and inability to adjust to a changing environment mean senility, often mental disorder.

Arrest of Development.—A man is often said to be physically just as old as his arteries; and his age is often gauged by his blood pressure or the functioning of his heart or his glands, or by the development and character of his bones, or of some other physical organ or function. In like manner, one's psychological age can be gauged in a general way by one's plasticity or his ability to adjust to new conditions.

Richardson has summed up the facts as follows:[24]

Where useless associations or habits persist and cannot be broken up, there is no progress. It is the inability or lack of proper incentive to break old associations and thus prepare the way for a higher level of activity that keeps the learner on the plateau. In the acquisition of skill, habits are formed only to be broken up. In fact, their most important function seems to be in allowing themselves to be broken up. They are the raw material for the next level of habit formation, and habits of this higher level the raw material for the next, and so on throughout the hierarchy of habit formation. As Bryan and Harter pointed out for the telegraphic business, most operators continue to use the raw material of what would make for skill if their old habits could be dissociated and reassociated into more efficient work. . . . Book found for typewriting that elaborate and circuitous methods of writing were constantly being simplified if there was progress. There went on at the same time the elimination of old habits and the recombination into new ones. Some of the earlier habit stages seem to have existed only to be eliminated, but most of them, as well as many of the seemingly useless mental strivings and acts, played an important rôle in the development of the higher order of habits. "They constitute the raw material from which the

more direct and economic habits are formed and are necessarily a precondition for their attainment. Those not used must be discarded regularly, discarded as fast as outgrown to keep the learner's progress from being arrested on a lower level of attainment than he is capable of."

In the higher and more complex forms of habit the same is true. Progress requires the ability to break down old habits and systems of thought. Just as soon as a man loses the ability to do this, arrest of development begins. As soon as one gets a closed system, in philosophy, or in education, or what not, further development ceases. The system may be an admirable one and an economic device that will enable the individual to do most efficient work, but further development ceases here. Henceforth the individual is a political or religious or philosophical or scientific moron, as the case may be, or else he becomes an intellectual neurasthenic in these fields; but normal progress is henceforth arrested.

Education and Habit.—Fortunately, conditions in this world do change, and this makes readjustment, reorganization, adaptation necessary. Just as soon as the old reaction becomes inadequate or unfortunate, or as soon as doubt arises in our thinking, readjustment, adaptation to new conditions, the new situation, becomes necessary. This conscious readjustment to a new situation is the other important part of education. From this point of view the function of education is the mediation between old and new habits, usually between habits of a lower order and habits of a higher order. It was thus perhaps that consciousness first developed. This has been well expressed by MacVannel in his book on *The Philosophy of Education,* as follows:[18] *

* From MacVannel, *The Philosophy of Education.* Reprinted by permission of the Macmillan Co., publishers.

It should be noted again that all consciousness appears when and where the old habits, the so-called organized reactions, break down or need modification. The nature of the personal or social consciousness of a period is determined by the nature of the stimulus, that is, by the sort of obstacle to be overcome. Habit, organized reactions, are the organized aspects of adaptation or adjustment. Adaptation, readjustment, reconstruction, is effected through consciousness. In terms of the social process, habits, customs, institutions, represent the conservative aspect; accommodation, attention, interest, discussion, discrimination, represent the organizing and reconstructing aspect of the societary process. All consciousness is accordingly experience of transition, organization, reorganization, reconstruction. In its work, its activity, what it does, is located the unity and continuity of the conscious process, whether in the individual or in society.

Thus the function of thought, of consciousness, and of education in the aspect we are now considering, is mediation between one level of experience and another, between an old habit which has failed or become inadequate and a new adaptation to the conditions of our environment.

Thus change of conditions means education. There must be adaptation to the new situation. Old habits must be broken and new ones formed. This is the condition of progress, and wherever either in the individual or in society a plateau, a dead level of achievement, occurs, the shock of change is necessary to bring about adaptations of a higher order.

All of this suggests, too, the great advantage of a changing environment, the educational value of travel, of meeting people who are different from ourselves, of encountering novel situations, of migration of students, and the like. In many cases of nervous disorder the best means of cure seems to be a total change of scene,

as this renders the breaking up of morbid habits easier.

It is probable that the organization of habit becomes complete in regard to some functions before it does in regard to others. We never perhaps live long enough for it to be complete in all. On the physiological side it should be noted that some of the nerve cells continue to develop throughout life; hence there is the possibility of new acquisitions. But for practical purposes in the case of most men it seems to be true that their habits become organized, their characters, as we say, established; and one who knows the fundamental motives in human life, the great human instincts, and also the habits of the individual, can predict pretty accurately just what a man's behavior will be in a given situation. As regards Titchener's second level of habit this is especially true, as was described long ago in a classic passage by James.[14]

> Already at the age of twenty-five you see the professional mannerism settling down on the young commercial traveller, on the young doctor, on the young minister, or on the young counsellor-at-law. You see the little lines of cleavage running through the character, the tricks of thought, the prejudices, the ways of the "shop" in a word, from which the man can by-and-by no more escape than his coat sleeve can suddenly fall into a new set of folds. On the whole it is best he should not escape. It is well for the world that in most of us, by the age of thirty, the character has set like plaster, and will never soften again (p. 121).

This, then, is the function of education—organization, adaptation, elimination of consciousness, automatization, fossilization, if you please; but all this as the condition of higher and more complex organization and development.

Two great aims in education are emphasized by the psychology of habit. On the one hand is the aim of developing right habits and hierarchies of habits in the different school subjects and in education in general. This is emphasized by all the books on the subject. It is, of course, tremendously important; but the other side of it is equally important. In the whole course of education, in order to develop the higher, the breaking down of habit or the fusing of simpler habits into more complex habits is essential, although the significance of this has seldom been emphasized by pedagogical writers.

The books are full of exhortation in regard to the importance of forming good habits; but the term good habits is always a relative one. Habits good to-day will not be adequate to-morrow. Hence, the aim of education is twofold: on the one hand, to form good habits as far as possible; on the other hand, to retain that plasticity or vitality, or what one may please to call it, which makes possible the breaking of habits when they become useless and the forming of new habits.

It is well here to take a lesson from Rousseau, and to avoid developing any habit unless we are sure it will be useful.

Generic vs. Specific Habits.—Habit like instinct is helpful to us on the whole. But the advantages of both come when the conditions remain the same; when conditions change, then both may be disastrous.

In our modern civilization, and the hurry and bustle and distraction of modern life, most intellectual workers waste a vast deal of nervous energy by improper habits of work. The methods of work that we have been taught, and that were good fifty years ago, are impossible for the worker to-day. We were taught to be saving of

time and paper and a hundred things. We were taught to do a thing ourselves if we wished it done, whereas for many of us to-day the great lesson is that of trusting some one else to do things for us. In short, we were taught to do a great many things that were essential then, but are not essential to-day. Consequently, the man of to-day often finds himself hampered by such habits of attending to the unessential as are illustrated by what Edward Eggleston says of himself. When I was a boy, he says in substance, the reading Mrs. Edgeworth's *Waste Not, Want Not*, made such an impression upon me that to this day I cannot cut a string in opening a parcel, without compunction. I have saved a few feet of twine, but I have spent time that was much more valuable in untying knots. And he rightly says nothing is more dangerous than a moralist or an economist without a sense of proportion. We need to be trained to ignore the unessential, and only by acquiring such habits can we stop the waste of nervous energy. But the essential changes; the essential for one man is not the essential for another; and this accounts for the condition in which we find ourselves to-day. We are in a new and complex civilization, surrounded by new conditions, and we have not yet adjusted ourselves to them.

The general pedagogical inference is that in early life generic rather than special habits should be acquired. Such are propædeutic to more complex and special habits that may be necessary later; and for generic habits, of course, conditions are less likely to change. It is better to train your child to be observant and economical in regard to a few important things than to teach him to notice and save every piece of string

or scrap of paper on the roadside, unless you are sure he is to become a ragpicker.

Obsolete Habits.—The enormous waste of energy that results from pedantic and useless habits that have survived from obsolete conditions of life is not a matter of indifference to hygiene. But this is by no means all. Such habits are not a mere passive burden, but they are likely actively to interfere with the acquisition of new forms of behavior, new methods of work, and normal functioning in general. Thus it becomes a matter of prime importance in mental hygiene to avoid interference of habits and interference of association; and habit, which is a good thing, because it simplifies activity and eliminates unessential elements, may become a bad thing when it involves unessential and distracting elements and makes them permanent. How commonly the latter is the case has been repeatedly shown by the studies of the so-called efficiency experts who have demonstrated the great number of unessential movements executed by the ordinary individual worker in almost any industrial occupation.

Interference of Habits

In the process of learning, even when lower order habits are superseded by higher ones, or when useless habits seem to be broken up, they may remain latent, and in moments of inattention, fatigue, or the like, interfere with the new habits.

Book found noteworthy examples of this in the learning of typewriting. He says:[2]

> It was observed by the learners that the older and more elemental habits used in the earlier stages of writing tended strongly to persist and force themselves upon the learners long after they had been superseded by higher-order habits. At

every lapse in attention or relaxation of effort, the older habits stepped forward, as it were, and assumed control, thereby tending to perpetuate themselves. Only when a high degree of efficient effort was being persistently applied, only when the learners were urging themselves forward so hard that these outgrown habits had no chance to be used was attention forced to lay hold of the higher and more economical methods of work.

The Conflict of Habits.—This coexistence of habits, especially where some of them are not thoroughly organized, is the occasion of much interference of association and much confusion. The antagonism and conflict have been described in a general way by Royce as follows:[25] *

In general, if familiar objects are already known to me in certain connections, it may be for that reason all the harder to learn to remember them in new connections. Or again, suppose that I am required to repeat some familiar act or series of acts, in a novel order, as, for example, to repeat the alphabet backwards. The new habit will meet at every step with a certain opposition due to the persistence of the old habit. A complex case of the difficulties in question is furnished by the perplexities of a countryman who first comes to live in a city, or by the vexations of a traveller in a foreign country. For, in all such instances, many of the new impressions tend to revive old habits, and consequently tend to hinder the acquisition of those new habits which are needed in order to adjust the stranger to his novel surroundings (p. 233).

The countryman would quickly learn city ways if he could forget his rural habits. We get the clearest illustrations of such interference perhaps from antagonistic motor habits. Jastrow has given many illustrations, among others the following:[15]

* From Royce, *Outlines of Psychology.* Reprinted by permission of the Macmillan Co., publishers.

Another example of such conflict of motor impulses may be arranged by attempting to write not by direct visual guidance of the pencil, but by following the tracing of the point (with the hand and pencil screened from direct sight) in a mirror or system of mirrors. The new and unusual visual guidance tells one to move the pencil in a given visible direction; but this direction of seen movement has always meant a certain kind of "felt" movement; and when that type of "felt" movement is set into action, it proves to be by the visual standard, completely and obviously wrong. The struggle between trying to push the pencil in the direction one *sees* one ought to go, and also in the direction one *feels* one ought to move, may become so intense as to be quite agonizing; and the attempt must be abandoned as hopeless. Remove the mirrors and use the normal visual guidance, or close the eyes and use the normal muscular guidance, and the writing proceeds fluently, with but normal effort and attention. Oppose the two factors of the normal combined and harmonious synthesis, and confusion irresistible—a confusion, not of conscious intent, but of execution, of deep-seated automatic motor mechanisms—takes place (p. 130).

Interference of Association.—In all the investigations of school studies and the studies of the learning process we find evidence of this interference of association. Burgerstein found recrudescent memories liable to interfere with the process of reckoning and to cause error. Arnett found that errors were frequently made from the interference of some preceding figure that delayed in the mind. Cole, too, found from introspection that "one type of mental confusion is felt to be an experience of too many impressions at once."[6]

Similar interference is a serious obstacle in the training of animals. Watson in his classic experiments in which he deprived rats of the possibility of receiving most of the extra organic sensory stimulations found that after the animal had thoroughly mastered the maze,

that is, just after he had learned to eliminate all errors, "from this point on he could be depended upon to do his work with steadiness unless some disturbing sound was made while he was passing some important turn in the maze. If even a slight noise were made at such a time, he would make a serious error, and unfortunately, this error was made on the succeeding trips at the same place again and again. If one such error were made, the connectedness of the whole series of movements was likely to be interfered with—the animal would get hopelessly lost. When in this condition, there was nothing left to do but to put him back in his cage and let him 'sleep it off.' "[80]

Individual Differences in Learning.—There are probably great individual differences in the facility of acquiring habits just as there are differences in the ability to break up habits. Very likely there are two distinct types: on the one hand, those who, for the most part, acquire habits only by the slow process of repetition; on the other hand, those who acquire many habits by shock, as we have called it, or a single vigorous initial reaction. The existence of such types would explain many remarkable feats of learning as well as the difficulty that certain individuals have in acquiring certain forms of reaction. In any case there are probably great individual variations.

In fact, Cole found two classes of chicks, as regards their reaction to pain stimuli. He adds:

With the difficult condition of discrimination, strong stimuli divide the chicks into two groups, those which succeed in learning to discriminate by reason of more right choices at the beginning of the training series and consequently fewer pain stimuli, and those which fail because of fewer right choices and more pain stimuli in the earlier trials. So far as I have

determined the sensitiveness of the chicks, it may be said that on the average the more sensitive chicks learned more rapidly both for strong and for weak stimuli.

The schools have put a premium on certain learning types. If an individual has a somewhat unusual method of learning, he is likely to be a misfit in the ordinary class. The school has neither time nor patience for the individual who belongs to an unconventional type, who has perchance the initiative, the ability to do things for himself in his own way; in a word, that matrix of originality out of which the works of genius spring.

The individual who is easily susceptible to suggestion apparently belongs to a type that learns by shock. A suggestion that is really effective is always a shock, that is, it brings about a vigorous reaction. Hence the great advantage in using the method of suggestion instead of the method of demonstration in the classroom because the pupil who receives and acts upon a suggestion not only does the thing himself, but makes a vigorous reaction.

Persistence of Lower Habits.—In all learning types and all acquisition we have perhaps hierarchies of habits. And, as already suggested, in any hierarchy of habits those of a lower order may persist and be the cause of interference of association. Book, for example, found, as he expresses it again, that:[2]

Long after a way of locating or making certain letters and words had been superseded by a higher and better way the old habits tended to recur at every relaxation of attention. This tendency could be overcome only by keeping attention so persistently and strenuously applied to the writing that the highest possible habits were used. It was the development of this habit that forced the learners to make new adaptations and short cuts in method and enabled them to leave the old

and less economic ways behind as fast as they were sufficiently perfected to permit the development of new and better ways of writing.

And one of his observers reported that:

The tendency to continue the old process of spelling a word, letter by letter, which has long been outgrown, and for which there no longer is time, is very strong. It requires special effort and continual care to keep from dropping into these older and slower methods of writing. You only outgrow them when you sprint sufficiently to leave them behind, or go so fast they cannot come in.

The Highest Condition of Health.—The total integration of one's modes of reaction constitute one's character, one's personality.

All this has often been discussed. What has not usually been emphasized is the fact that one's mental and physical health likewise is determined largely by one's habits.

All the forms of skill, however, acquired by voluntary practice, all the permanent habits of association, that is, interests acquired by study, are so many achievements in adjustment and potentially so many means of self-control, so many safeguards of health. Thus sound education is distinctly a means of health, and learning a condition of normal development. But this represents the safe anchor to the past. The more distinctive example of health is furnished by the zone of growth and change where new acquisitions are being built up and old ones are breaking down; for the highest condition of health is not passive and static, but active and dynamic.

The movement for the development of health habits

in the young, the habit clinics under Thom [29] and others, and the attempts at the reconstruction of habits in the hospitals for adults, have shown how largely conditions of health are written in terms of conditioned reflexes and systems of conditioned reflexes.

Summary

To sum up briefly, we may put the essential points and the practical inferences concretely somewhat as follows:

1. A habit may be looked upon as a system of conditioned reflexes, and the conditioned reflex as the element in habit. The word habit is often used loosely, however, to include both conditioned reflex and systems of conditioned reflexes.

2. What is learned in the form of a conditioned reflex and functioned by the cortex remains a conditioned reflex arc even when automatized.

3. Habits are formed in two ways, first, by an intense initial reaction, which we may call shock; second, by repetition.

4. Habits may be broken in two ways: first, by substituting by repetition another habit antagonistic or compensatory; second, by setting up a new habit by a single intense initial reaction, that is, by shock. In both these cases, however, it is doubtful whether the old habits are really broken up or only repressed and coexist with the new.

5. In forming a new habit the initial reaction must be brought about by some means, either by putting the individual in a situation where the given reaction becomes inevitable, or by developing the desired reaction

in connection with other familiar reactions, and then by dissociation of it from the given group of reactions, or by accident, usually by trial and success in some way.

6. In forming a new habit it is always desirable to begin with a strong initial reaction. This is what James means when he says one should launch oneself into a new habit with as strong a resolution as possible.[14]

7. The practice of a habit should be continuous. The number of repetitions is often not as important as continuous drill. One should never allow an exception. This makes a relapse easier and interference liable to occur. This has been emphasized by James and Münsterberg. The latter writes:

> To form habits of spelling, or grammar and style, or of observation and generalization demands the same rules as the habits of good manners at table, or of dressing, or of bicycling. In the world of ideas, too, every slip counts and every break undermines the new tendency. And in the case of mental and physical habits alike it is important to acquire them in definite forms and never to let them go on by chance. It is much easier to learn precise habits than loose ones.

8. The value of habit consists in the economy of energy that results from automatic activity.

9. One should be cautious about forming habits where conditions are variable. Habit is a good thing when conditions remain the same, a dangerous thing when conditions change. Hence generic habits are often safer than specific ones.

10. We should note that if one makes, as we may say, a cross-section of the human organism at any moment, one finds habits in all stages of organization—some incipient, some nascent, some fossilized into automatisms. We should note further that, when a habit becomes com-

pletely automatic, it may combine as an element in the formation of a higher and more complex habit; thus in any acquisition of skill, in any subject of study, or the like, a hierarchy of habits may be formed.

11. Education consists in a systematic effort to form habits. It has a twofold aspect: on the one hand, organization, automatization, economy, mechanism, and fossilization; on the other hand, the acquisition of new habits and new forms of adaptation, the substitution of a new adaptation where an old habit has failed, or where conditions have changed. On this side education means adaptation, readjustment, growth.

New habits are formed on occasion of new stimuli. But the character of the new habit or the new mode of reaction will depend on the old modes of reaction or old habits of the individual. The new modes of reaction are assimilated to the old. The new habit is a resultant of perhaps several lower order habits.

12. In all education, especially in motor training, it is desirable that all habits formed should be propædeutic to habits of a higher order, to those habits that must be developed later; and the value of the lower order of habits is often that they may fuse as elements in higher habits or may be broken down to make way for higher habits. The ability to break incipient habits and habits of a lower order is a mark of sanity and a vital condition of health. In education this plasticity, if we may call it such, should be retained as far as possible.

13. Interference of motor habits or of mental associations is liable to occur in all processes of learning; and often this causes not only waste of energy but mental confusion and worry.

14. Habits of skill acquired by voluntary practice are in marked contrast with ordinary habits acquired by

reaction to one's environment. Both are potentially important conditions of mental health.

15. Every habit is likely to have hygienic value, being either a habit of health or the reverse, because of the associations, conditioned reflexes, or the like, involved in it.

Thus we find that the effect of education on the neural mechanism is the stimulation of normal development, and that the hygienic conditions of habit and memory are the conditions of cerebral hygiene and cerebral function in general.

Problems and Questions

1. Give concrete examples of habit.
2. Report cases from your own experience or observation where habits have been formed by shock or by a single intense reaction.
3. Give a concrete illustration of a hierarchy of habits.
4. What should be the relation of the simpler and more elementary habits to the higher and more complex ones?
5. While it is not true that by mastery of an accomplishment like spelling it is "transferred to the spinal cord," is the value of automatization any the less?
6. Comment on Rousseau's dictum that a child should form no habit.
7. What is the value of retaining the ability to break habits?
8. What is the danger from pedantic and trivial habits?
9. What is the gauge of mental age from the point of view of the psychology of habit?
10. Describe the relative merits of generic as compared with specific habits?
11. What distinction would you make between habit and skill?
12. Why is every habit helpful or injurious to the health of the individual?

13. Read, if you can, the chapter on habit in *Psychology* by James, or else the short one in his *Talks to Teachers.*
14. Form a new habit and study it from the point of view of mental hygiene.

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CHAPTER VIII

THE SCHOOL TASK

Not many years ago the idea prevailed that if a person had common sense and knew the rudiments of a subject, he could teach it in an elementary school; that if one had a modicum of wit and that supreme academic acquisition, a college education, he was fitted for any position in a high school; such a one was supposed to be a teacher by the grace of God and the authority of his alma mater.

To-day it is different. There are many ways to teach a subject, many educational gospels, many creeds. Theoretically, one should know the genetic point of view, mental-age levels, educational psychology, experimental pedagogy, the problems of retardation and acceleration, group psychology, group pedagogy, and mental hygiene.

The up-to-date teacher to-day feels that she must know something about all the new movements, and not only about feeble-mindedness, intelligence tests, standard scales and the like, but also psychoanalysis, the Freudian mechanisms, social and antisocial attitudes, the principles of sociology, if not those of psychiatry.

In the narrower field of pedagogy different leaders claim attention. In the older days educators were divided into the followers of Pestalozzi, Froebel, Herbart, or Hegel; or more recently in this country those of Harris, Dewey, and G. Stanley Hall. To-day the cry is "I am of Montessori," or "I, of Kilpatrick," or "I

believe in the individual method," or "I, in the group method," or "I practice the project method," or "I, the problem method," or "I, the Dalton plan," or, perchance, "I use my own methods."

If one wishes help in one's own mental life and personal problems, the doctrines and advocates of many schools press forward. Among them are the methods and theories of self-analysis, psychoanalysis, new thought, dream analysis, theories of the unconscious, the subconscious, and the more concrete theories of Freud, Jung, Adler, and a host of others.

Confusion of Aims in Education.—Thus to-day in this country and in England there is much confusion, and no consensus in regard to the definite aims of the school at different periods. This aimlessness is paralleled by the uncertainty and conflict of opinion in society. As Hoover pointed out a few years ago, almost every ism outside the realm of common sense has found ready followers in this country; and the danger that threatens comes largely from the remedies suggested. All this indicates an unhealthy mental condition, both in individuals and in society. In the homely words of Poor Richard, "many medicines, few cures."

The children naturally suffer from this confusion in education and society. The modern slogan is send the whole child to school; but seldom, except in play and the best forms of physical education, is the whole child properly cared for after he reaches school. The child's physical health is often menaced by insanitary school conditions, and the mental health of the pupils is liable to be still more neglected.

Integration the Positive Aim.—It would help to get clearly in mind the fundamental aim of education and mental development. With all the distracting voices and

discordant claims, the positive aim, as we have seen, is the integration of the personality that makes right adjustment possible.

The Essentials of Mental Hygiene

If then we may take this as representing normality, what can hygiene do to develop integration of the personality and to prevent disintegration and maladjustment? This brings us to the very core of sound education and mental hygiene. The problem is, of course, complex, involving the deeper questions of heredity and environment, the functioning of the endocrine glands, even diet and other factors of somatic hygiene, and especially individual differences, early training and the like; but cannot mental hygiene give something simple to begin with, a fundamental point of view from which to study the more concrete problems in detail?

The answer is very simple, so simple that most people will fail to realize its significance. Hygiene and education can give opportunity for coördinated activity, physical and mental, in the doing of tasks worth while.

Three Essentials for Mental Health.—This leads to another more concrete and practical question, namely: What are the minimal essential conditions of human happiness? Reduced to their lowest terms, what are the fundamentally essential conditions of mental health —conditions universal for all, young and old, rich and poor, the educated and the uneducated, the different emotional and ideational types, the individual with robust health and the invalid alike? On the basis of observation and many investigations, the answer may, I think, be formulated very simply as follows: The essentials, without which a person cannot be quite sound mentally and with which, apart from accident, infection,

or heredity, one can have no serious mental disorder, the absolutely essential conditions are three: a task, a plan, and freedom.

The task in the generic sense includes everything from the immediate and concrete goal of the moment to the objectification of the highest ideals and ends. A plan is necessary to make the work purposive activity. It must be my own task; hence freedom is necessary.

It is hardly necessary to dwell on the evidence that these are the essentials of mental health. Function, work, is the condition of health everywhere. Mental activity is even more essential for health, if possible, than physical activity. In all conditions of life and society, work is the condition of health and happiness. Stanley, in the heart of Africa, rousing his discouraged men every morning to face the apparently interminable forest, says that the remedy for all misery, discouragement, and despair is work. This, which is so excellent a remedy, is still better as a preventive. If it were necessary, it would be easy to show how, as long as one has a task and the ability to work, happiness and mental health are insured. Think, for example, of General Grant sick with incurable disease and yet working until the end.

Task and Project.—Of course, with the word *task* are connected some unpleasant associations of school tasks, task masters, and fatigue; but this is largely from a wrong attitude toward tasks. If the word has an evil connotation, we teachers are largely to blame because we have not dared to give freedom. Some one may ask why not use the word *project*. The connotation of the word *task*, which we have used, is broader and covers the essentials of pedagogy and hygiene much better than the word *project*. The word *project* sug-

gests a business or social venture, or even, perhaps, in some cases, a form of play or recreation. The word *task*, on the other hand, connotes a serious purposeful activity. Some would prefer the word *problem;* but, although one of the aims in the doing of tasks is to develop the problem attitude, the broader term is better here.

A few simple examples are enough to illustrate this meaning of the word *task*. Not only by usage in the psychological laboratory and the schoolrooms of the world, but also in all the affairs of life the word *task* connotes the serious business of life and at the same time suggests the zest of healthful activity in every true workman who does honest work and enjoys the doing of it. This zest in doing a task is the highest attraction to children in a normal environment. Above everything else they delight in doing something that is serious, just as they see adults working at their daily tasks. They can develop an interest in doing a job as a real job should be done.

The Word "Task."—In all the literature of the world's work we find illustrations of this connotation of the word. Thus at the memorial service to the Unknown Soldier at Arlington the chaplain in his prayer alluded to the coming conference on disarmament by saying "On the morrow an unusual task will be taken from the workbench of the world." In such allusion to serious business no one could possibly substitute the word project.

The fault in many of our schools to-day is the lack of serious purpose and the dawdling and instability of the pupils in their occupations. The essentials, as has often been pointed out, are the development of a sense of responsibility, the spirit of coöperation, thorough-

ness in doing a task, and the habit of finishing of one's task, or in the words of the workman, putting a job through. The word task suggests all this better than any other.

The Task Means Many Things.—Of course, in the task and the plan many other things are involved. Perhaps one should add the attitude of the learner, readiness to face reality, although this is probably involved in the three essentials mentioned. Again the task should have a halo about it which makes it seem worth while, but this, too, would be involved in the task, because with a definite plan and with freedom the halo is bound to come in the doing.

A vast literature to-day emphasizes and illuminates this subject. The recent observation of psychiatrists from Forel [8] down in regard to the value of interesting work for the mentally disordered, the studies of the higher mental processes, especially the significance of the *Aufgabe,* as shown by the Würzburg school in Germany and Baird and others in this country; the Freudian wish, as interpreted by Holt; and the project method in pedagogy, which in new garb to-day has done so much to revive and vitalize the old essential doctrines of self-activity, spontaneity, and purposeful performance—all these represent different aspects of it.

A score, perhaps, of recent books in education—in this country, books emphasizing the project method and motivation, in England, books emphasizing purposeful activity and the problem attitude—may be summed up in the words—task, plan, and freedom, and what is involved in them; so that the clear understanding of these fundamental conditions and what they mean for the mental health is more important for the teacher than superficial reading of many books on principles and

methods, and worth more than a mere knowledge of all the mental tests, standard scales, and all devices for increasing and measuring the scholastic product, because without this one does not see the meaning of the tests and scales. With this on the one hand one sees the real value of methods, tests, and devices, and is able to keep clear vision in the field of practical education and hygiene in spite of the pedagogical dust always blowing into the eyes of teachers from certain quarters.

This is what the project method and similar devices really mean. This is the significance of movements like that of the Boy Scouts. This is the meaning of many progressive schools that put emphasis on doing. Thus from the point of view of education, as well as that of mental hygiene, the best summary of essentials is in the words—task, plan, and freedom.

The Core of Mental Hygiene and Education.—This, too, better than anything else, illustrates the real core of mental hygiene. It is concerned with precisely such simple matters of everyday life, especially with the doing of worth-while tasks. Occupational therapy and methods of reëducation in the cure of the mentally disordered are notable examples. An interesting task is still better for prevention.

This simple doctrine also gives a foundation for one's own educational philosophy. Every teacher and student of education desires to go on and learn many facts, new truths in psychology, new pedagogical methods, and to attack many new problems. In all this study and acquisition our simple point of view gives a fundamental principle by which one can integrate the truth in manifold teachings, because if sound all practical philosophies of education will involve these fundamentals.

The natural way to give both health training and

moral training is by starting with the child's tasks for which he feels responsible, impressing the fact that some tasks are imperative, that some must be done at a definite time, that failure to perform a task means discomfort, trouble, and loss of things desirable, and that the opportunity for the task may be lost altogether. This gives a natural starting point, too, for the development of other interests and other important habits. Hetherington's remarkable study of the interests of children in their own physical activities and general health, shows in concrete form how children are interested in certain essentials of diet, sleep, and regimen in general, because they recognize that conditions of health and the amount of exercise and kind of food and drink taken are significant in determining their ability to perform their tasks.

The Essentials.—1. Perhaps all will agree that the first essential is a suitable task.

2. The second essential is a plan. A mere task without a plan is likely to be mere movement, uncoördinated activity. A plan makes the action purposeful activity. If a child makes his own plan, that develops interest and initiative.

3. This suggests the third essential, freedom—freedom to take a task or leave it, freedom to form one's own plan.

Freedom Dangerous but Necessary.—Naturally, the objection will at once be made that to give freedom to the individual pupil to choose his own task and to form his own plan is dangerous. This is true enough; but though freedom does, of course, carry danger with it, the dangers largely are averted by the stimulus of the task itself. The task is the sternest drillmaster. There is no compulsion like that of the child's own task.

Every individual, of course, finds his freedom limited, and it must be limited by social convention, the rules of the school, and the rules of the game on the playground; and control and guidance are necessary; but, as much as possible, freedom is desirable. The limitations of freedom should, however, be enforced, and absolute obedience required in a few things.

From the point of view of mental hygiene, as well as education, a maximum of freedom is necessary. A condition of mental health means adjustment. Mental disorder is lack of adjustment. The adjustment made by children in the first few years of life is vitally important. No one is wise enough to make it for a child. No one could do it if he had the wisdom. The child must make it for himself. To do this he must have freedom. Any prescription means inhibition. The *necessary* inhibitions come from the natural conditions of the task itself and a few important commands. If implicit obedience in a few things is inculcated, these natural inhibitions are sufficient. At a later period more conventional training is necessary, less freedom and more adjustment. At all stages, however, as much freedom as possible should be granted, in order that an integrated personality may be developed.

Practical Aspects of the Three Essentials

These three essentials of mental hygiene and of education for the individual represent also the fundamentals in industry. A task, a plan involving coördinated and purposeful activity, and a maximum of freedom for the individual worker, are the essential conditions of prosperity and industrial health.

Work for every one, a definite task, represents a vital function in society comparable only to the constant

metabolism necessary for the life and health of the human body. Work, opportunity, stimulus for every one to work, and that freedom that carries with it responsibility, represent what may be called that social metabolism without which industry and prosperity are impossible.

As in the field of psychology, the task, in technical language, the *Aufgabe*, conditions everything, so in education, whether with the child in the kindergarten or the student in the university, the task is the great thing, and the day's work becomes the central interest.

Parents and Teachers Do Too Much.—All this is simple, so extremely simple one almost hesitates to repeat it, but the activity of the child in his own tasks is the very thing for which we, as parents and teachers, do not have time. A very large percentage of American parents to-day give their children everything whatever except the one thing that above all they need, namely, a job.

One of my old students reports of his own boyhood a representative case of the pathetic blunders of parents:

> And work! My good-natured, well-meaning, generous-hearted father, himself a farm lad, big-boned, and hard-worked in his youth—he believed in working for me and letting me have a good time. I never knew the meaning of work until he died and I was left to hunt a job for myself.

Such parents make one think of the words of Bernard Shaw who says that parents are the worst people in the world for children to live with. How common it is to deprive children of this essential of mental health, one can hardly believe. It is trite to illustrate it. It is a thing so common we fail to see it.

Mothers and parents do everything for their chil-

dren and then are surprised that the children can do nothing for themselves.

It is the same with teachers. They try to do everything for a child, they give him little opportunity to do anything for himself. The work of the school is insistent; and thus for the sake of the program or for the sake of the textbook, or the rule, or for the sake of the teacher's own method, the child is given little opportunity to do his own task in his own way. Thus a score of conditions in the public school tend to produce failure, all so many devices for hindering the child from doing the very thing most essential.

We Rob a Child of His Task.—No one has put this more concretely and more clearly perhaps than Angelo Patri in one of his little essays:[11]

It seems too bad that the child should be caught up in the rush of the daily grind. He tries to discover what the things going on around him are all about. He investigates, experiments, and he would like to think, but he can't. There's no time.

He takes up a broom to see how it works. He makes a few ineffectual swings with it and is settling down to work in earnest when somebody discovers him and takes the broom away.

"Come, now. I'm in a hurry. I can't have you messing things up just after they've been put in order."

He goes to school. All sorts of strange experiences are presented to him. He would like to feel his way among them, try them out, think about them. But he can't. There's no time. He gets well started on a lesson when the bell rings and the teacher stops him.

Another lesson comes along and he is asked a question. He has not expected it just that way and he hesitates, he must gather his thoughts.

"Can't wait for you. You're too slow. You should have prepared your lesson. Next."

Neither the teacher nor the mother have time for such things. It is all very well for you to say that one should wait for the child, but when shall we get our work done?

Well, what is your work? . . . I believe it is better to teach a child what he wants to know at the time when he wants to know it. I believe that in teaching him in that light he will get on faster and so will you.

What good will it do you to reach the end of the journey, panting and breathless, only to find that you have lost the child on the way?

We Rob a Child of His Plan.—Again as regards the plan, of course a thing should be done right. But there are several ways of doing most tasks. Other things being equal, it is far better if a pupil invents his own plan. And yet we always like to have a thing done our way. Miss Arnold used to tell a story in point.

A class in arithmetic have solved a problem. One boy raises his hand and says: "Teacher, I did that this other way and I got just the same answer." The teacher replied, "Now you think you are smart, don't you? You go back to your seat and do it the way I told you to."

Of course, it is necessary sometimes to give drill on a definite method, but more often it is desirable to give the opportunity for initiative and individual thinking.

A Rich Environment Is Needed.—For young children, at least, with the opportunity for many tasks, in a natural environment, there is little need for prescription. The ideal is a rich environment out-of-doors. This, unfortunately, most children do not have. As Miss Dewey says in her recent book, *The Dalton Plan:*

What does a child to-day have to give him the understanding of his world that came from helping in the endless activities that went on in every home a hundred years ago? A little, if

he live on a farm; nothing whatever if he live in a city slum. But schools still go on as if the old conditions prevailed. They have done nothing to supply the real experiences that he got out of school when each home or community was a self-supporting unit.

What should be provided is manifold opportunity for tasks in a natural environment. This is the burden of the teaching of that master among the world's gardeners, Luther Burbank. He writes:[1]

> Every child should have mud pies, grasshoppers, water-bugs, tadpoles, frogs, mud-turtles, elderberries, wild strawberries, acorns, chestnuts, trees to climb, brooks to wade in, water lilies, woodchucks, bats, bees, butterflies, various animals to pet, hay-fields, pine cones, rocks to roll, sand, snakes, huckleberries and hornets; and any child who has been deprived of these has been deprived of the best part of his education.

Such an environment gives opportunity for many tasks.

The school, however, is attempting more and more to supply its present lack. The far-reaching significance and possibilities of the task is illustrated in a hundred fields to-day by all the varied active methods in education, not only the vocational activities, the making of toys, making apparatus in the different subjects of instruction, but by all the concrete activities of those schoolrooms where the teacher adopts the active method and gives children actually the opportunity for doing worthwhile tasks.

The Didactic Habit.—By a strange irony of fate, since the teacher's task is to teach, naturally that becomes the one thing that the teacher always tries to do, until the didactic habit becomes so strong and there is so much teaching that often there is actually little opportunity for learning. The teacher is so interested in teaching and in teaching children to do things in what the teacher

deems the right way, that again, it is often true, as Patri says:[11]

> Lessons are a battle between the effort of the child to get his job done and the struggle of the teacher to get him to do it the proper way. He starts to write a composition. Now, in all fairness, I ask you could you write a story without misspelling a single word, omitting a punctuation mark, without erasing words, crossing out whole lines? Write it all in fine penmanship, sitting up and holding your arm and your penholder exactly as the boy in the picture on the back of the writing manual does? Could you do it even in the quiet of your own office?

Hygienic and Educational Values

The Task and Responsibility.—Most important of all, the educational effect of the doing of tasks is the sense of personal responsibility thus developed. The task becomes the great thing and the sense of responsibility for it dominates everything. This, while primarily, perhaps, of educational and ethical significance, is fundamental also for the mental health; for with this sense of responsibility for the task one has little time for thinking about petty personal interests or other childish matters, or even about the agreeableness or disagreeableness of the task. One's ideal becomes that of being an honest workman and of doing well the day's work.

The new things in education are very old, and to-day we do well to go back and recall some of the simple fundamental things taught nearly 300 years ago by that prince of schoolmasters, Comenius, who gave us that nucleus of common-sense genetic pedagogy without which no teacher can succeed and with regard for which it would be difficult for any one to fail. We do well also to go back to the fundamental teaching of responsi-

bility embodied in the categorical imperative of the great philosopher Kant, and the development of that sense of reverence for the moral law expressed so eloquently by the great philosopher of Königsburg, who exclaimed in his well-known words, "Two things impress me with ever new and increasing awe and reverence, the starry heavens above and the moral law within," or the equally imperative doctrine of our own philosopher Emerson, who, in his terse and homely phrase taught that there is no way of getting around a duty but by doing it. Such sense of duty and responsibility is needed in a time of crisis like this to save and vitalize education and civilization. This sense of responsibility cannot be developed by mere instruction but only by the actual doing of tasks day after day from childhood up.

We Rob the Child of Responsibility.—As already noted, teachers and parents are afraid to give children freedom and put upon them the responsibility for choosing their own tasks. Feeling our own responsibility so keenly, we choose the tasks for children with the greatest care and conscientiousness up to the period of puberty, and then perhaps we choose still more carefully and conscientiously; and finally, having never given them the responsibility for choosing, we at last find ourselves obliged to let them choose their work and calling in life. For such choice with its stupendous significance and results, they have had no training, no preparation; and yet, because of our conscientiousness in choosing for them all through life, we expect them, by some miracle at this time, to be able to choose wisely for themselves. What wonder that misfits occur!

Criticize such teachers for not giving freedom and the opportunity for real training in responsibility, their

excuse is their own responsibility for their students. The dilemma of the teacher is that suggested in concrete form by a little girl whom the writer knew. Her aunt, with adult wisdom and long experience, says:

"Grace, I wouldn't do that if I were you, I think you would be sorry for it."

Grace replies: "If experience is so valuable as you say it is, Auntie, why do you wish to deprive me of it?"

In our extreme anxiety that pupils should get no harm and do their best, and our care to protect them from everything injurious, we probably fail to realize how strong an appeal can be made to the children themselves and how readily they will respond when we actually place responsibility upon them. Especially in the higher grades this is true.

The Results of Doing a Task.—The whole psychology and pedagogy of discipline is bound up with the question of suitable tasks, since with opportunity for suitable tasks preventive discipline is likely to be all that is needed; and, as regards discipline of the higher order, nothing can give such training in the development of responsibility as the doing of a task which the child himself chooses and attempts in his own way in a situation where he feels himself personally responsible.

All the great educators recognize that the aim of education, expressed in psychological terms, is the development of interest, and all practical teachers recognize that attention is the means of developing interest. Again, interest and attention are the results of the doing of a definite task. Pathetic efforts, however, are seen everywhere of those who try by rules, exhortations, or devices, to develop interest without the doing of tasks. Mothers entertain their children instead of giving them opportunity for a task and wonder that the children

are not happy; teachers exhort the children to give attention and regret that they are not interested in school work, and they report that lack of interest and attention is the most common fault among pupils. They should learn the simple psychology of interest and attention. It is not from exhortation or instruction, but by the actual doing of something, that interest is developed. "Commit thy ways unto the Lord and thy thoughts shall be established."

The hygienic value of a task comes from the fact that in the doing children both develop an interest and also learn to face reality. Thus a fitting task is as essential for education as for hygiene, and to attain the common aim of healthful development, to provide suitable tasks and a maximum of freedom, and to give proper training both in education and in mental hygiene, no institution is so well adapted as the public school.

Wider Aspects of the Task

To teachers and parents it may be said: You can make the tasks such as to give opportunity for success or make them of a kind to insure failure. You can make the tasks such as to develop permanent healthful interests in the pupils or such as to dull interest. You can make the tasks of a kind to develop healthful attitudes or the reverse. One can study the tasks and allot them from the genetic point of view so that they give opportunities for work and success for individual children at each stage of their development, or give them in belated sequence, or prematurely with futile or injurious results, or under conditions that insure the deadening discouragement of failure. Finally, you can always take the task out of the pupil's hands and make it after all yours, or you can allow the pupil to do it

and to get the reward of doing and of success. Thus, in providing the simple essentials of mental health, the teacher shares in the deepest possible responsibility.

The Kind of Task.—Some one is sure to raise the objection that all depends upon the kind of task one has. Not so. Rather, all depends upon the mental attitude. Few aspire to the task of the ordinary laborer on a city street. But this was the task of Giovanni, and after years of happy and successful work, when he returned to Italy, like the artist that he was, he carried his shovel with him because it was a superior shovel. Its handle was rightly made, its scoop had just the right curve, it hung in the right way. Altogether it was the symbol of artistic and superior work.

Naturally, we think of the historic tasks of the great men of the past as romantic, but the psychology of my own little task or that of my neighbor working at the grossest labor on the street, is the same if done with the same mental attitude. Jacob toiling seven years for Rachel, his love for her making the time seem as a few days; David watching over his flocks and composing his immortal poems on the hills of Judea; and, in later times, the apostles going forth on their mission of service and healing; and the Great Master himself doing His daily task, humble or great, whether washing the disciples' feet or preaching to the multitude; all the great men of history, ancient or modern—Stanley in his search for Livingstone, Gorgas conquering the tropics, Macmillan exploring the Arctic, Foch conquering the Germans by smoking his pipe, these all had romantic tasks, to be sure; but the psychology of it all was precisely the same as that of the child matching his sensory images with the reality of purposive action, or of the common man or woman in the most humdrum tasks of their daily

lives. To the mental hygienist there is a peculiar interest in the fact that Beers in his autobiography, *A Mind that Found Itself,* refers to his work with the National Committee for Mental Hygiene as "The Romance of the Task."

The wider significance of the task has not been too strongly emphasized. To treat its full significance would mean the study of all purposive activities from the lowest to the highest—creative activity in all fields of art and the insight that in all industry and all the fields of human labor, as well as in all forms of education, the thing of real value is the opportunity for a significant task. Although in the various forms of artistic production, the artist long ago gained the insight that the work is vastly more important even than the product of the work, only recently have a few begun to see that in all fields of industry, as well as in education, the opportunity for doing significant tasks is the great thing; that along with labor and capital and the other fundamental elements in industry there is always present in some degree this other higher psychological factor, so that no kind of labor can be rightly evaluated except in relation to *opportunity.*

The Child's Attitude.—When we consider also mental health and development, all depends on how one does a task. We should conserve something of the child's natural attitude toward its own task. This may be made clearer by a very simple concrete illustration. Some years ago a little friend, perhaps five years of age, used to come every morning, apparently when opportunity offered, to put my letters in the mail box. The little fellow was able by some effort to reach up, open the box and succeed in getting the letters inside. The doing of the task and the success in its accomplishment were the

reward. This, however, was so great that he was eager to do it and would come and wait for the letters and ask anxiously if there were any to be mailed that morning.

In this case the child had a task of his own choosing, he developed his own plan for getting the letters into the box, he was free to leave the task or take it, he found his reward solely in the doing, the meeting of the difficulties, and the success achieved, really a two-fold success, that of the motor accomplishment and the social success of service for another person. This was also a purposeful task, it had its halo from a certain sense of sharing in the great and mysterious but obviously significant business of life, a certain prevision of the future, and a feeling of beginning the great tasks of men and women, the great work of the world.

It would have been the easiest thing in the world, and to many people a natural thing, to have given this child some material reward, money or the like, and thus vulgarized and cheapened his task, changed his artist attitude centered on the doing into the materialistic attitude of thinking of the reward. It would have been easy to have changed his attitude of joy in the work, and feeling that the opportunity for the task was the great reward, to a feeling that the doing of the task was a disagreeable thing called work, for which one should have money payment or the like. Or, worse still, one might adopt the method still used in some schools and make the task a punishment.

This concrete illustration suggests how easy it is to develop in early years that zest in work for its own sake and that attitude which places the opportunity for work and service above everything else. There is no danger but that soon enough the child will learn the necessity of getting money and rewards. All too soon there is

danger that this will choke the instinctive attitude of workmanship, that only with long self-training, and perhaps never, will the individual get the true perspective which sees work and service in large letters and material reward as secondary.

The Golden Rule.—Our ethical teaching has been to the effect that we should do service, deeds of kindness to others, that we should always be ready to help and assist our friends and neighbors. This is well and, of course, of the utmost importance, and yet this attempt at aiding others sometimes overreaches itself and becomes an injury. In any case there is another side to the whole matter which has been forcibly stated by Professor Genung of Amherst, who says the golden rule should be taken not only directly but reversed, not merely to do unto others as you would that they should do unto you, but to give others a chance to do unto you as you would be glad to do to them. In other words, give others the opportunity for a task in rendering service to you instead of selfishly claiming all the opportunity to do service to your friends. Nothing is so great a service, nothing so great a gift, as to give another an opportunity for a task worth while and the achievement of that success which comes in the doing.

The Loss of a Task.—In a world full of tragedy and pathos, the most pathetic figures are those who have lost their tasks—the old man who could not keep the pace, or who was robbed of his task on account of the conventional illusion that in the last quarter of human life chronological age and mental age are the same; the man who loses his job because of physical defect or mental disorder; the man who sacrifices his own task out of loyalty to the social group of which he is a member; the workman who loses his job by any of

the accidents of our mal-organized social system; the sons and daughters of wealth who never had the training of any significant task in relation to the hard-hitting conditions of real life; and so on through the whole category of jobless men and women.

In this whole group of unfortunates saddest of all are the children who have been robbed of their tasks. The others still have the will to work and the integration of the personality that has resulted from tasks already performed; and all of them, even the physically defective and mentally disordered, have the chance, at least in the hospital or the like, for another task suited to their strength and ability. But the child robbed of his task has not yet acquired that integration that makes right adjustment to such conditions possible, and lacks that initiative and will to do that make opportunity available.

The greatest thing in all education is a child's spontaneous doing of a task, and the greatest thing the teacher can do is to give opportunity for a task worth while. The most important condition of mental health and the most important preventive of mental disorder is a suitable task; and the greatest thing for an individual, the ordinary man, or man of talent, or even the genius, is some great task worth while as a life work. Fortunately, the teaching profession furnishes such a task.

The Worth of Personality.—With the training in adjustment and the pressure of convention and formal education, as represented by modern methods of formal training, acceleration, and the like, mental hygiene emphasizes the truth that in all this education, this drawing out of the child's abilities, the child should not lose his own soul. Modifying Hall's slogan, mental hygiene goes back to the more original form of the question:

What shall it profit a child if he gain the whole world of conventional adjustments and lose his own personality, or what shall a child give in exchange for his soul?

The simple essentials mentioned, a task, a plan, and liberty, involve the most fundamental problems in human education and human society. Weak, finite, the victim of unknown forces, over which he has no control, man, facing the reality of such facts, develops either a wholesome sense of dependence, the essential of the religious consciousness, or else he acquires a sense of inferiority and loses his grip in the inevitable conflict. If rightly educated, he adjusts to his physical and social environment, and if rightly trained, he integrates his powers to meet the problems that beset him.

Something more than what is usually understood by adjustment results from training. Although weak, and the sport of unknown conditions and forces, with a span of life too short even to study intensively the personal problems of his own existence and his own health, it is possible for man to develop a wholesome integration which enables him to coördinate his powers to meet any situation, however difficult, and to do the best possible within the limitations of his own personality, and at least to make a fight worth while for its own sake. And again by right training he is able to develop wholesome social relations and integrate his own little contribution with that of the social groups of which he is a member.

The essentials for this training are at once the essentials of sane education and of sound mental hygiene. The A, B, C of both are the same—a task, a plan, and freedom.

Summary

The especially important points in regard to the hygienic and educational significance of the school task are in part as follows:

1. At the present time much confusion exists in regard to the aims of education.

2. Something simple and fundamental as a starting point is needed.

3. The minimal essential conditions of mental health and education alike are a task, a plan, and freedom.

4. Evidence that these are the minimal essentials is furnished not merely by observation, educational experience, but also by the experience in occupational therapy for the feeble-minded, the nervously disordered, and many patients in general hospitals.

5. Freedom to choose one's own task and form one's own plan is necessary in order to develop initiative, personal responsibility, and to avoid unfortunate inhibitions.

6. Part of the work, both for normal children and the defective, should be group work, involving the social significance of the tasks.

7. These minimal essential conditions are so simple that teachers and parents alike neglect them.

8. Teachers and parents alike are prone to interfere, and by taking the tasks out of the hands of the children largely destroy the opportunity for responsibility and success.

9. The school task has its wider social, ethical, and educational, as well as hygienic, significance.

10. The function of the teacher is to provide opportunity for a suitable task and the conditions that make success for the individual possible.

11. The doing of the school task under the conditions mentioned gives the best possible training for integration of the personality.

Problems and Questions

1. Report cases of children you know who have spontaneously chosen definite tasks and work at them diligently.
2. Describe a plan or method that you have observed where the main thing was the pupil's performance of some task.
3. Report cases you have known where sick people have been benefited by having a definite task to perform.
4. In what ways have you observed that parents rob children of their tasks?
5. Report concrete cases of methods or practices used by teachers that rob the pupils of their tasks.
6. Report cases you have observed in the home, or society, or cases that you have read about, where one person from supposed kindness, or the attempt to do service to another, has unkindly robbed the person of his task.
7. From your study and thinking, would you add any other essentials of mental hygiene to the three mentioned, a task, a plan, and freedom?
8. Will it attach a child to you more to do him a service, or to let the child render a service to you?
9. Report illustrations of great men who have devoted themselves to some task as a life work.
10. Report what you think the wider significance of the task for the mental health of individuals and society.

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CHAPTER IX

THE SOCIAL TASK: THE ADJUSTMENT OF TASKS

MENTAL hygiene shows the essential importance for mental health of the social task. Here, perhaps, its greatest contribution is likely to be made. Most of the candidates for mental disorder show in childhood or at adolescence certain abnormal symptoms in their social life. They are unsocial, antisocial, or, at least, social failures. If mental hygiene did no more than show the importance and complexity of the problem and suggest a method by which it may be solved, this in itself would be worth while. The hygiene of the individual task is so simple that most ignore it, that of the social task so complex that few understand it.

THE COMPLEXITY OF THE PROBLEM

The teaching of hygiene that coördinated activity in the doing of tasks gives the essential conditions for integration of the personality is so simple that all can understand it. When, however, practical application of this principle is attempted, a multitude of conditions tend to complicate the problem. Instead of a world with simple tasks and concrete indications for each individual for the performance, with fitting tasks for every one and freedom for all to work, we find a world of complex activities, group tasks rather than

individual tasks, hierarchies of tasks of increasing complexity instead of simple tasks, many ways of doing the same task, many opinions in regard to the best way of performing tasks, many minds, many desires, many conflicting motives. Instead of individuals who have similar habits, harmonious aims, who can coöperate efficiently as members of a group, we find everywhere individuals with different habits, different aims, extreme individualists, who cannot coöperate, tasks that are difficult and require the working together of many diverse individuals, and, most serious of all, varied personalities, always conflicting more or less with each other, always misunderstanding each other; instead of collections of peaceful laborers working together in simple tasks, hard-hitting bustling groups of workers, critics, cynics, hustlers, sluggards, the bright and the dull, the industrious and lazy, the toilers and laggards, the trustworthy and the slackers, and so on in indefinite conflict, and discord of purpose and aim.

Factors in the Problem

All this diversity and friction in a social group give the stimulus necessary for the social development of the individual, but for practical purposes these disintegrating factors and conditions should be studied in the concrete situations of the homes and workshops and schools in order to give opportunity for fitting social tasks and social success. A few general considerations may be noted.

Physical Conditions.—Here, as everywhere, it is tremendously important to study the physical condition of the individual child as affected by such factors as diet and metabolism, the functioning of the endocrine glands. conditions of climate, temperature, humidity.

fatigue, and the like, and all the hundred factors that condition our well-being.

Mental Condition.—Equally important with the physical condition of the individual is the mental condition —intelligence, special abilities, emotional characteristics, and a hundred individual differences due to heredity and environment.

Acquired Subjective Conditions.—One group of mental conditions may well be specially noted. Even among children by the time they enter school the acquired mental conditions are significant. They are by no means confined to neurotic children, although the lack of them or the unfortunate conditions acquired by the neurotic emphasize their importance. At a later age they are largely conditions imposed by the individual himself. One historic neurotic, John Randolph of Roanoke, himself a sadly disintegrated personality, expressed this clearly in the following words:[5] "We have all two educations; one we have given to us—the other we give ourselves; and after a certain time of life, when the character has taken its ply, it is idle to attempt to change it." This self-education consists of the development of these psychic conditions, self-control, orderly association, and the like, that are the essentials for mental health. These are largely concerned with the adjustment of the individual to the different social groups.

Social Conditions.—Inevitably, when an individual joins a social group, individual response and individual interest are in conflict with group interests. A few examples suggest the complexity of the relations.

In case of children before they have received special social training, especially if they are given that free-

dom necessary for the best individual development in the doing of tasks, the conditions by which they are limited, the checks and hindrances placed upon them by their companions, the suggestions, advice, and inhibitions of adults, not to mention a thousand associations of the individual child, all make a complex situation which is bound sometimes to threaten the personality. That some children become oversensitive and pathological, that others develop a sense of inferiority, that still others become conceited and many more dulled and indifferent, is by no means strange. The conditions that threaten the personality, of course, differ as widely as the individual variations in the personalities themselves. So that in a group of children one may never know in regard to some of them how sorely they are wounded by the innocent behavior of the group—their companions, adult teachers, and the like.

Inhibitions.—The practical conditions in school that tend to disintegrate the personality are largely summed up in a general statement to the effect that whatever causes continued interference and inhibition of one's tasks, or robs a child of his task, tends to disintegration.

As soon as a child enters a social group he is beset with inhibitions of every kind, not merely the inevitable clashes of interest, desire, the conflict of the individual with the group, but more definite inhibitions by guides and leaders. Not only parent or nurse or teacher is always advising, suggesting, or interfering, but the individual children of the group imitate their elders, always crying, "Don't do this, don't do that." Nobody in the group allows another to do a task unhindered. Precocious children say, "You ought not to do this,"

or "You ought to do that," so that the words *ought, don't, must,* become the words common with the older children; and among teachers they are used so ludicrously that soon they are among the most overworked words in the group. For many years it has been the writer's duty to correct the dissertations of advanced students in education preparing to become teachers. A great part of my corrections have consisted in eliminating an unnecessary supply of the words *must, should,* and the like. They are professional terms that characterize the teacher as a specialist. They seem to be more than this, the result of an almost instinctive impulse common among those who are attracted into the teaching profession. But to-day the use of these words is no longer the earmark of the calling. In many American homes no words are used so commonly as these words of exhortation and prohibition.

Thus in the ordinary group of children as well as of adults, no one can let another do his own task in his own way, so that it comes to pass that long before a child graduates from the high school he is apt to develop into the ranks of the advisers, leaders, exhorters, reformers. A long list of other children, fond parents and companions become the victims. Bad as it is for them to be subjected to the dulling influence of such inhibiting companions, who block everything that another attempts in his own way, it is still worse for the children themselves who have thus precociously entered the ranks of so-called leaders. The inhibition on their own development may be even worse than that on their victims, because as soon as they can direct others, why should they learn? And when they have acquired this overdevelopment of the ego complex, what opportunity

is there for the development of humility, free companionship, and the truly scientific attitude?

The Problem of Freedom

If one makes a special plea for freedom in the doing of social tasks, freedom for the pupil to choose his own task and his own plan, parents and educators are pretty sure to be afraid of it. They see clearly and in lurid colors the extreme dangers of freedom in the schools; and any attempt at reform and any plan for placing responsibility on the individual pupil and giving him the opportunity and the benefit of doing his own task in his own way, is sure to be opposed as a dangerous innovation. Hence it is no wonder, on the other hand, that the advocates of what the English call free discipline, MacMunn, Holmes, and others, have sometimes gone to extremes in their arguments for the child's freedom. The advocates of freedom and the champions of control should come together and study the problem of saving the pupil from undue interference.

A few illustrations from widely different sources will illustrate some of the more common and subtle forms of this interference. The victims are many, both adults and children. Sometimes the interfering habit becomes pathological. A representative case, probably pathological, with an adult clergyman in the rôle of the child and wife as trainer is given by Bandler:[8]

By the time they had three children she had formed the habit of correcting the thousand and one small faults into which he fell without knowing it. The way he ate; the way he sat at table; the way he held a book; the way he coughed; the way he yawned; the way he shook hands; the way he pronounced certain of his words; the way he gave out his notices

in church; the way he allowed other men to walk over him—these, with a hundred similar details, had become the sphere of her loving conjugal discipline.

Such training does not so much matter in case of the mature members of a family; and adults have many protections. In case of a child such attention to minutiæ may cause serious inhibitions. The training is very apt to be in regard to the child's own health; the result, mental disorder in minor form.

The tendency of teachers to interfere and rob a child of his task occurs not only in the higher grades and the ordinary instruction of the schools; but even in the kindergarten, where the fundamental principle requires the study of the individual pupil and opportunity for the child to live his own life without artificial disturbances and hindrances. That this statement is not the hasty inference of a scientific theorist is indicated by the following quotation from a recent report of the Health Committee of the National Kindergarten Union: [42]

Nothing can be a greater nervous strain than to have some one continually at one's elbow to suggest or correct or to pick up one's work suddenly and set it right just as we were about to find a way ourselves. This nervous strain does not occur so much in the formal, dictatorial kindergarten where the children soon come to recognize that the teacher will do all the planning and they have little personal responsibility. It occurs more often in the kindergarten of a young teacher, whose ideal is to help the children develop initiative. She arouses their enthusiasm in a problem—and then cannot patiently let them think it out or work it out alone. Time is flying! The juggernaut of the program must go on its triumphant way regardless of how many slowly forming ideas it crushes and the busy, busy teacher interferes. She interferes with the way Mary carries her chair—and sets it right; she interferes again when Mary's

work is almost done—and with a deft touch spoils Mary's work by making it the teacher's. Is there not in this undue interference a nervous strain to the child which can be lessened without destroying his respect for order and organization? . . . . The great thing is to make sure that the sincere efforts of little children are crowned sometimes with success appropriate to the given situation and that this occurs before the point of real nervous strain begins.

The Result of Haste and Fear

What wonder is it, when everybody is hurried and there is no time in the occupations of the school and the home for children to do their own thinking and act quietly and naturally, that, in spite of general statements about the importance of the child's work and eloquent addresses on festival days and public occasions, a child comes to feel that his own personal work is of relatively little value. If we could strike the balance in quantitative terms, probably we should find that one of the greatest sources of waste of energy comes from these indirect forms of fear. The child, of course, may not have an acute fear of the teacher, but when the teacher's manner suggests dullness and failure in the child, or inefficient or improper behavior, or that the child is too slow, that the teacher's time is wasted, and, in a large sense, the pupil is not of much account, naturally the sense of inferiority gradually develops.

Of course, the natural defense mechanism in all such cases of fear and sense of inferiority is to try to avoid direct contact with the teacher, avoid situations of rivalry with other pupils, recite as little as possible, avoid problems and duties and opportunities alike; in a word, in a hundred more or less important details, to shirk responsibility.

The Psychology of Social Conflict

In a far more subtle and radical manner the individual comes in conflict with other members of the group. The study of the conditioned reflex suggests that this conflict often has a deep-seated psychological basis. Humphrey, in his study of the elementary social reaction, finds that the simpler forms of sympathy, what is often called organic sympathy, are produced in accordance with the method of the conditioned reflex, and he attempts to trace the consequences of this theory.[16]

He points out that in case of habits, or systems of conditioned reflexes, one has a feeling of unpleasantness when one cannot make the habitual response to a situation. If I see another person in the same situation, the situation arouses in me the same impulse to the habitual response, I experience much the same unpleasantness if the response is blocked or a different response occurs. The habit acquires a sort of psychological sacredness. If I note the given situation in myself or another, I feel the need of the familiar response. I am disturbed if it does not occur. If, for example, I see a fly on my neighbor's nose, the stimulus to me is the same in minor degree as if it had lighted on my own nose. If my neighbor does not make the usual response and try to brush off the intruder, it disturbs me, perhaps disgusts me. The blocking of a response familiar to me is disagreeable whether it occurs in myself or another.

"If, further, there is a person whose whole form of life, complex of habits, and personality, are alien to my own, I find that person irritating. Such a person is continually violating by proxy the habits which I have formed." So rightly says Humphrey.

Thus, as Plato pointed out, we are intolerant of the perfectly good man because the example of such a man continuously outrages our cherished habits of selfishness. Thus the mediocre are intolerant also of the artist because the behavior of the artist continuously outrages conventional habits of thought and behavior, and thus, in general, we are intolerant of those whose custom of living and habits of thought and life are distinctly different from our own, not perhaps because we disapprove of them, but rather because the sight of this different form of behavior constantly irritates us by producing associated stimuli that are distinctly disagreeable to us.

The Child's Relation to the Teacher

If we apply Humphrey's explanation in the school as a social group, we see at once how significant it is. First of all, in the relation of teacher and pupil. The teacher's habits, at least in the school situation, are those of order, methodical activity, accuracy of statement, care in the expression of one's thoughts, and, in not a few cases, primness, conventional behavior, and probably pedantry in regard to pronunciation of words, form of sentences used, and the like. The child's habits, on the other hand, are those of freedom, refreshing disorder, carelessness in expression, unconventionality, lack of pedantry, whether in behavior or in grammar, and a natural spontaneity that may be pleasing outside the school situation, but is likely to be taboo within the school group. With this enormous difference in the habits of the teacher and the child it is no wonder that irritation, aversion, discord, and the age-long conflict between teacher and pupil, have often developed. The

social situation as regards some pupils in their relation to the teachers, or, perhaps, to the school as a social group, becomes intolerable. They leave school as soon as possible. If no other adequate excuse for leaving can be found, a physical or mental disorder of some kind is developed.

The Low Stage of Social Education

Nothing complicates the problem of giving a child the opportunity for fitting social tasks so much as the low stage of social education in the community and our lack of knowledge of the principles of social education. As all of us are at a low stage of social education, it is hard for us even to appreciate rightly what the situation is. It may help to recall some of the more obvious manifestations of this lack of social education. A few points may be noted with arbitrary brevity.

1. *Inability to Coöperate.*—Most of us are unable to coöperate in the doing of tasks. We are individualists. We can dominate others. For money, friendship, or on account of fear, we may be willing to subject ourselves to others. Really to coöperate most of us are unable. In the War this was the usual defect among the soldiers. In peace it seems equally prevalent. When coöperation is a rare virtue in society, it is hard to train children to coöperate.

2. *Inability to Understand.*—We are unable to understand those who have opinions and interests different from our own, whether it be in the small matters in the family and neighborhood groups or the large matters in the large industrial and social groups, as illustrated in the apparently hopeless conflicts of opinions and attitudes in coal strikes, conflicts among railroad officials

and employees, or the divergent views of political parties and religious sects. When parents cannot understand their opponents, it is hard for children to keep clear of prejudice.

3. *Inability to Adjust.*—As members of a social group, large or small, we are unable to take fittingly the inevitable interference from other members of the group or the clash of interests between the group welfare and individual welfare, whether it be to ignore, to resent, or to laugh.

4. *Unwilling to Take Responsibility.*—We are usually unwilling to take responsibility. In small matters we have innumerable mechanisms of defense culminating in physical incapacity and disease; in large matters, committees, directors, trustees, supervisors, and the like —and many other mechanisms of defense for evading responsibility. Apparently the will and ability "to pass the buck" recognized in the War as the great American characteristic could be eradicated only by millenniums of peace.

5. *Unwilling to Let Others Take It.*—Unwilling to take responsibility ourselves we are usually unwilling to let others take it without interference. Hence we are always robbing others of their tasks. This makes the social training of children especially difficult. The many ways in which this is done, even in the school, will be illustrated in later chapters.

6. *Neglect of Certain Groups.*—Most of us are unwilling to serve in certain social groups. We may be admirable members of the family group and excellent neighbors, but ignore our duties as members of the larger social groups. Some are devoted members of the gang, the club, the church, the political party, or even

patriots or reformers, but untrained in domestic duties. Few are properly trained to serve in groups large and small, homogeneous or heterogeneous.

7. *Neglect of Cosmopolitan Groups.*—As part of the defect just mentioned most people are unable or unwilling to coöperate in cosmopolitan groups. Since the War we have had illustrations of the inability to cooperate in the world group.

8. *Inability to Coöperate with Enemies*—Most of us are unable to coöperate with our enemies. A distinguished public man has been quoted as hoping to accomplish great things by the "coöperation of friends." This, however, represents a relatively low stage of social development. In the highly developed social group the members are able to coöperate with their enemies, and will never allow personal interest to interfere with cooperation for the welfare of the group.

9. *Inability in an Unorganized Group.*—Most people are unable or unwilling to behave fittingly in an unorganized or disorganized group, like the ordinary or usual crowd. Neumann laments our subway manners. Also at a low stage are our railway manners, our automobile manners, even sometimes our concert, theater, and church manners.

10. *Inability to Integrate.*—We are unable to aid properly in the integration of a group.

Extreme Individualism

In a word, we have most of us been such rampant individualists that social development is at a low stage. Hence a social problem is always a difficult one, whether the problem of your individual child or that of the League of Nations.

If you desire concrete examples of our present stage of social development, try by these standards any of the community social groups of which you are a member, or such large groups as a church synod or the United States Congress.

It is difficult to give social training to children when adults everywhere exhibit the unsocial attitudes of suspicion, narrow self-interest, prejudice, and the like.

Such illustrations are enough to show the complexity of the social-task problem. If they seem to leave the matter in rather hopeless conflict, that is about the way it stands to-day. In certain directions, however, the light is shining. It is much to have recognized the complexity and importance of the problem, the aim as training in group work, and the genetic and hygienic point of view as helpful.

Social Principles

The principles to follow are those emphasized by mental hygiene:

1. The individual should be trained by membership in a real and natural social group rather than talked to about social duty.

2. The training should develop integration of the personality in facing the distracting stimuli of the social group.

3. One should be trained to individual responsibility in the group.

4. One should be trained in conditions that give opportunity for social success.

5. All this implies freedom.

In view of the complexity of the social problem, our lack of knowledge, and the low stage of social education in the community, the one outstanding need is in-

telligent experimentation in the application of the clear principles of sound education and mental hygiene.

The Adjustment of Tasks

In spite of the difficulty of the problem much can be done for the individual child in giving opportunity for suitable tasks, both individual and social. We may note the adjustment more concretely. Although proper adjustment of a task to an individual in the process of development would require omniscience, the child may be trusted usually to make a fitting choice, if we are able to give rich opportunity. Of course, the ardent educator wishes to do more than this and sees in large letters the danger of giving a child opportunity to choose for himself, but the hygienist, seeing the complexity of the problem and fearing a greater danger in prescription, tries to get all possible means for giving suitable opportunity for the child to choose for himself. The following are some of the aids:

Adjustment to Physical Condition

The first, of course, is to give opportunity for a task suited to one's physical condition. Whether for child or adult this is essential. The experiment at the Ford shops in Detroit furnishes a good illustration. Here the men with physical defect are retained. Jobs are classified, and those suited to the physical ability of the individuals allotted to them. Men with one arm, or one leg, the blind, and others, are working efficiently, more than 7,000 in all.

The Genetic Point of View.—Here especially the genetic point of view is necessary. Child hygiene differs from adult hygiene because the child's body is a grow-

ing organism. Opportunity should always be given for tasks suited to the child's stage of development. It is just because a child's body and sensory and motor organs are in process of growth and development that a child's school tasks should be adjusted to physiological rather than chronological age, and be provided according to the well established teachings of child hygiene. Here, too, is where the limits of what can be done without injury to health impose a few imperative prohibitions in regard to tasks of children. In all these matters the physiological development of the child is our guide. Physiological, not chronological, age should everywhere be the standard.

The genetic point of view in mental tasks and in mental hygiene is quite as important as in somatic hygiene. The most ambitious and extensive effort for adjusting school tasks on a scientific basis and from the genetic point of view have grown out of the movement for mental measurements. Hence some of the significant aspects of this will be recalled here in some detail.

Mental Measurements

When hygienists and educators gained a clear idea of the fact that chronological age is no satisfactory indication of the stage of one's physical and mental development, studies were undertaken to determine the stages of real development. From one point of view after another, genetic studies were made until, on the basis of data obtained, in some cases fairly adequate, in others very inadequate, the following forms of development, or distinctions of age, so-called, have been distinguished.

1. *The Chronological Age.*—The chronological age merely indicates an individual's age in years without re-

gard to his development, either physical or mental.

2. *The Anatomical Age.*—This indicates the stage of structural development of the human body. Many more or less careful investigations have furnished data here sufficient to show clearly that the body of the young child is a different structure from that of the mature adult individual. In recent years certain parts of the skeletal structure have been taken as a standard and gauge of the general anatomical development on the assumption that the development of these parts is correlated with the general osseous development, and this, in turn, with the general anatomical development. Thus the growth in height, the development of the teeth, or the development of the epiphyses of the bones have been taken as indices correlated with general development. For example, studies by Rotch, Pryor, and Woodrow have assumed the general correlation of epiphyseal development with the general development of the skeletal structure, and they have furnished evidence of the correlation of the latter in turn with general development.

3. *The Physiological Age.*—This represents the stage of general physical development at which a given organism may be. Studies by Crampton and others have shown that such development is not necessarily correlated with chronological age, and have shown also the significance of such development for the mental ability of the individual. Here again it is often customary to take the development of some one organ or physiological function as representing the general physiological development, for example, the development in height and weight, the development of the teeth, or the physical manifestations of sexual development, especially at the period of puberty.

4. *The Psychological Age.*—This indicates the stage of general mental development at which the individual may be, and has loosely been assumed to be approximately the same as the development of intelligence in the individual. This is an error, however, for the mind means more than intelligence, including emotion, what is popularly called the will, special abilities, and the like.

5. *The Scholastic Age or Pedagogical Age.*—By this is meant the knowledge and ability of the individual in the conventional subjects and occupations of the ordinary school.

6. *The Social Age.*—This indicates the stage of an individual's development as gauged by one's social accomplishments, ability to do the fitting thing, and get on successfully and without friction in the ordinary conventional social groups.

7. *The Moral Age.*—This means one's stage of moral development as gauged by one's possession of those traits of character and those habits of moral behavior commonly recognized as representing the essential morals of a given community. This, of course, is closely connected with the social age of the individual but is not necessarily the same.

8. *The General Development.*—By this is meant the total development of the individual, physical, mental, moral, social, pedagogical. If we should follow the same use of the term age, this represents the individual age. This has often been recognized but not usually estimated, except in a general way in certain occupations and more concretely in certain vocational studies. Gesell of Yale, in careful scientific studies of pre-school children, attempts to determine this total development by continued tests and observations of the same chil-

dren and to estimate the development quotient, the D.Q., as the significant thing.

The tests of mental age are not intended to test emotion, but inevitably the emotions have an influence on the results of the tests. Some distinct advantages would result from distinguishing the emotional age. This has not yet been carefully studied, but would indicate that stage of emotional development and emotional control at which the individual may be. Hitherto this has been somewhat vaguely assumed as a factor in moral, social, and mental age, having an enhancing or retarding influence. As yet there are no well established tests or standards for determining this, but as soon as significant tests can be devised, this emotional development should be studied. Recent studies of the endocrine glands in relation to emotion indicate the possibility of quantitative as well as qualitative investigation.

Tests of Intelligence.—The investigations of development thus far have been largely studies of intelligence rather loosely identified usually with mental age. Mental characteristics and mental differences for the most part are qualitative, not quantitative. The subtle but significant differences in temperament, attitudes, interests, instinctive tendencies, and individual capacities can be gauged by no mental measuring rod or quantitative standards yet devised. It is, nevertheless, desirable that some quantitative method of studying children should be employed wherever common elements and common characteristics make this possible; and, as Boring has pointed out, rank orders can be determined. Hence the great interest in mental measurements and hence the many methods, scales and standards devised by a long line of investigators from Galton and Binet down to the multitude of clinical psychologists of to-day.

The limitations of human nature are recognized by everybody. Each individual is capable of a certain amount of physical growth and development conditioned by inherited type and other innate conditions. Again each is capable of a certain definite amount of mental growth and development conditioned by heredity and innate characteristics. In the early years of life this appears as a certain common factor in the special abilities of the individual, a common factor that we call intelligence.

No Test of Pure Intelligence.—As Boring has pointed out, it should be remembered that intelligence that we can measure is simply what the tests of intelligence test. No satisfactory intelligence test exists that tests a single type of mental operation. Most tests, in Boring's phrase, are batteries of single tests. The correlations among the different tests that make up the battery called an intelligence test are not very high, not usually as high as the correlation of one combined intelligence test with another. These results are due to the fact that the separate tests are really tests of separate abilities, each of which involves in part intelligence, that is, intelligence is a factor common to all the tests, and also in part a special ability. When, however, the separate tests are combined in a total score, the special abilities are supposed to cancel out so that the score represents the common factor "intelligence." To quote Boring:[4]

> Thus we see that there is no such thing as a test for pure intelligence. Intelligence is not demonstrable except in connection with some special ability. It would never have been thought of as a separate entity had it not seemed that very different mental abilities had something in common, a "common factor."

How far intelligence is inherited, how far it is determined by environment in the early years of life, we do not know. Boring thinks that in some way it is largely predetermined by the age of five, although the investigations of Krasnogorski, Gesell, and others, at least suggest the possibility that the predetermination comes at a still earlier age.

Thus we may look upon intelligence as a common factor in many special abilities, something that can be roughly measured. One factor among many in the mental life developing mostly in childhood and apparently predetermined at an early age.

Limitations of the Tests.—The limitations of the intelligence tests are pointed out by Terman and should always be recognized. Although defects of intelligence usually involve disturbances of the emotional and volitional functions, in the first place they are not intended to test the emotions or the will, except as these are naturally shown in the manifestations of intelligence, nor do they show the special directions in which intelligence can be applied. Second, they do not attempt to test special abilities, for example, in drawing, painting, music, mathematics, and the like. They are not a detailed chart for vocational guidance. It merely shows in a general way the limitations of the vocational field where an individual's intelligence will permit success. Third, the scale is not intended as a complete pedagogical guide. Pedagogical methods have to be worked out in a practical way for the various grades of intelligence.

Special Abilities Slighted.—Boring thinks that one reason for the misunderstanding of the tests is the tendency to slight the special abilities, and he notes the obscurity in the terminology.

The tested intelligence of an individual is often called his "mental age"; the increase of intelligence in childhood is generally called "mental growth." In this way psychologists have inadvertently equated the "intelligent" to the "mental," overlooking in their terminology the vast number of special abilities that help to make up the "mind." It is high time for a change of words here. The present usage requires us to say that the average adult has a "mental age" of about fourteen and that "mental growth" on the average stops at fourteen. Nothing could be more untrue. The statement can be true only of intelligence as the tests test it. The special abilities, which make up skill and knowledge, continue to cumulate presumably throughout all adult life.

For convenience certain technical terms are now used to indicate the results of the tests of individual children. Among the most important of these are the following:

1. *The I. Q. or Intelligence Quotient.*—This represents the relation between the individual's chronological age and his intelligence as tested by certain standard tests. This is usually stated in the form of a fraction and equals the intelligence shown in the given tests divided by the chronological age. 100 is usually taken as the standard for the given chronological age.

2. *The D. Q. or Development Quotient.*—This term is used to denote the relation between the chronological age of the individual and his general development, physical and mental. Unfortunately, relatively few studies of this relation have yet been made, and the tests for determining this have not been completely standardized. Its importance can hardly be emphasized too strongly. Especially significant and valuable are the investigations of the general development of young children now carried on at Yale under the direction of Gesell. The results already indicate that this is the

specially significant relation both for hygiene and education, and that it is quite possible to study this relationship, and, in fact, apparently the best opportunity for studying this is presented in the early months of life.

3. *The A. Q. or Accomplishment Quotient.*—This represents the relation of a child's accomplishment to his special capacity in a given subject. The capacity of children for the work in arithmetic, for example, differs greatly. The intention is always to give a child tasks fitted to his special capacity in the given subject. If a child has little capacity in arithmetic, for example, a correspondingly easy task is given him. If a child has ordinary ability in arithmetic, a task of ordinary difficulty is given. If a child has superior ability in arithmetic, a correspondingly more difficult one is given. Thus in ordinary school work the task being fitted to the capacity of the individual child, the Accomplishment Quotient should be 1. An Accomplishment Quotient less than this means negligence on the part of a child or else faulty instruction.

Of course, many other significant relations might be studied in the school, and other relations will probably some day be standardized. Those already mentioned are the ones in more or less general use to-day. All of these obviously are at least indirectly important for the mental health and normal development of children.

The relation that has been studied most is that represented by the Intelligence Quotient or Mental Ratio.

Classifications for the Quotients.—Terman [30] and others have given somewhat varying classifications for the different intelligence quotients. The suggestions by Terman in his classic work on *The Measurement of Intelli-*

gence may be taken as representing the approximate relations:

I. Q.	*Classification*
Above 140....	"Near" genius or genius
120—140....	Very superior intelligence
110—120....	Superior intelligence
90—110....	Normal, or average, intelligence
80— 90....	Dullness, rarely classifiable as feeble-mindedness
70— 80....	Borderline deficiency, sometimes classified as dullness, often as feeble-mindedness
Below 70....	Definite feeble-mindedness

Clinical experience and observation indicate that an I. Q. of 70 as the limit of normality should not be taken rigorously. At least clinical reports give cases of individuals with an I. Q. of less than 70 who can not be considered either clinically or socially feeble-minded. Burt would modify this limit considerably, and, as I understand him, not classify adults definitely as feeble-minded unless with an I. Q. of 50 or below.[10]

Uses of the Tests.—The uses of intelligence tests were pointed out years ago by Terman, and the many investigations since have given evidence of the correctness of his statements. The following are some of these uses:

1. In the identification and grading of the feeble-minded, indicating the degree of defect before deciding on the content and method of instruction, and again in extending our conception of feeble-mindedness to include milder degrees of defect than are generally associated with this term.

2. In showing the frequent association of delinquency and mental defect, evidence for which is given by many investigations in prisons, reform schools, and the like.

3. In showing that children of superior ability are approximately as great in number as the feeble-minded, perhaps about 2 per cent, an estimate corroborated by Terman's more recent studies.

4. Intelligence tests are found useful in the case of ordinary children as aids to correct grading for school work.

5. The tests are useful as an aid for determining vocational guidance. Still other uses of these tests are found in the study of the different factors which condition mental development, for example, in child hygiene and in practical pedagogy.

When used in connection with observation and tests of special abilities they are valuable in adjusting tasks both individual and social.

Tests of Special Abilities.—In case of normal children still greater aid perhaps may be had from the tests of special abilities.

The Binet-Simon tests, and the like, are useful for a general diagnosis of psychological age, and it is relatively easy to determine the arrests of development which cause the obvious forms of feeble-mindedness. For the higher forms of feeble-mindedness, however, where the arrest of development is at the psychological ages of perhaps 9 to 11, the matter is not so simple. Some now believe that the mental development may be arrested as regards certain functions and not as regards others, that it may be arrested for one environment and not for a different environment. Thus it is with everybody perhaps. All have their mental development arrested or retarded as regards certain functions, while as regards certain others most people are superior in some form of development. Of the special abilities Trabue writes:[36]

The strongest conviction that has come to me in my work with tests is that we must have tests to measure particular abilities, rather than tests of general mental ability. Instead of reporting a child as mentally defective, we must point out the respects in which he is deficient, and to what degree. A physician does not diagnose a case as merely "a serious illness," but he seeks to discover the respects in which the patient is ill, and to base his treatment upon these particular symptoms rather than upon "poor health in general." Psychologists and educators must likewise be able to point out in what respects a boy will probably be defective for life, and must then seek to adjust training to the individual's possibilities.

Tests in Pre-School Life.—Recent studies, especially those of Gesell, indicate that the tests of intelligence can, for the most part, be made satisfactorily at an early age. Since the I. Q. changes little with chronological age, probably all usually necessary, after intelligence tests are more perfectly standardized, will be a determination year by year of the development quotient, the D. Q., that is, of the full development, both mental and physical, provided tests in pre-school life and a thoroughgoing examination, physical and mental, are made at school entrance, and perhaps during the first year or two of the school period.

This is the time, however, for careful tests of special capacities in order that the students in different subjects may be properly classified, tasks suited to individual capacity given, and the opportunity for each pupil to develop superiority in something. In a word, pre-school life and the first years of school are the period for intelligence tests, school life the time for tests of special capacities. The latter largely have been neglected. Although the tests of intelligence already made show alarmingly little intelligence to measure, we may at least make the most of the special abilities.

In his *Energies of Men,* James suggested the need of a topographical survey of the limits of human power in every conceivable direction, like an ophthalmologist's chart of the limits of the field of vision, and said we ought to construct a methodical inventory of the paths of access or keys in different individuals to different kinds of power.

Scholastic Measurements.—Attempts to measure the results of teaching or the school product were begun in 1864, according to Thorndike, when a scale book was prepared by the Rev. George Fisher of the Greenwich Hospital School in England. In 1894 Dr. Rice attempted to establish standards in spelling and arithmetic. In 1910 Binet and Varney published a crude scale for testing the results of teaching in various subjects. Since then standard scales in a number of different school subjects have been prepared by many teachers. For example, scales have been devised in arithmetic, by Thorndike, Courtis, Woody, and others; in spelling, by Ayres, Jones, and others; in composition, by Hillegas, and others; in drawing, by Thorndike; in silent reading, by Monroe and Starch; and in geography, by Hahn and Lackey.

These scales give a definite objective standard for the accomplishment of a scholastic task, permit comparison of the work done with the performance of the same task by others, and, to a certain extent, are a gauge of the teacher's performance. As one writer has expressed it, "in fact we are gradually approaching a position in which a teacher in an isolated school may be able to test his pupils in such a way as to put them into the same balances as their more fortunate coevals in populace centers."[1] *

* p. 112.

Neglect of the Mental Attitudes.—Hygiene looks somewhat askance at these scales and standards because they indicate chiefly the scholastic product and tell us little about the mental attitudes and interests which are so important for the mental health. This is nothing against the scales as such, if used for the special purpose for which they are designed. Hygiene does, however, note the tendency, where special emphasis is placed on the scales and standards, to focus attention unduly on the mere product of school work and to neglect the mental processes involved and the mental attitudes developed.

Studies of Vocational Fitness.—The great number of studies of the fitting industrial or business task for different individuals have yielded results of value for the educational problem. Some of the more recent of these. like Fryer's and those mentioned by him, have been concerned with the relation of intelligence, vocational interest, and the like, to the adjustment of the task. All are significant as showing concrete aspects of the general educational problem of the task. Other studies of the relation of the practical problems of vocational guidance to the great educational and hygienic problem of the task may well be made. The wider significance of the vocational studies and an introduction to the extensive literature are given in the convenient handbook by Brewer.[6]

Reliability of the Mental Tests

Many different factors affect the result of the mental measurements, and many sources of error exist. For example, the mental attitude of the person tested as determined by many conditions may seriously affect the results. Bronner has reported the following case:[8]

Recently we had a striking illustration of this point. We were compelled to see a boy when three spectators were present. They were seated in such a way that they faced the boy, who, therefore, never for an instant was unconscious of their presence. His embarrassment was as evident in his general manner as in his failures on tests, which he later did satisfactorily. At the first interview his Binet record was as follows: All 9-year tests correct; three failures in the 10-year group, and three in the 12-year group . . . he likewise made several errors in addition and became hopelessly involved in a problem in long division.

Several days later this boy, 16 years of age, was seen alone. Now all the 10- and 12-year Binet tests were correct except definition of abstractions in the 12-year group; no errors were made on the completion test; the construction test was done in 44 minutes with no incorrect or unnecessary moves. Number work was still poorly done, this being the field of his greatest weakness. The boy himself said, "I got rattled the other day, there were too many people around."

The Attitude Important.—The attitude aroused by the question or problem presented is itself significant. This seems to be well illustrated by an old test, given many years ago by an English teacher, Mr. Kemp, and recently tried in a number of English schools.[44] It was in substance as follows: "Capt. Cook made three voyages to the South Seas. In one of these voyages he was killed. In what voyage was he killed?"

According to one report, to each of 35 candidates, between the ages of 10 and 12, those most highly recommended out of 90 from the elementary schools, an oral test was given with this question. Only 6 of the 35 candidates could answer the question correctly.

Again in a written test this question was written on the blackboard unseen by the children who were from 7 to 12½ years of age. Then the question was uncovered and half a minute given to write down the

answer. Only 41.8 per cent answered correctly. Other groups did better, but a large percentage failed.

Obviously, as suggested by one of the writers in the *London Times* supplement, wrong attitudes toward the question were aroused in the children. Some of them perhaps thought it a catch question, and, in any case, certain inhibitory associations were probably called up. This serves as a good illustration of the inhibitions liable to be set up by our tests. The fact is that the mental tests themselves cannot be rightly estimated except by considering the mental attitudes and associations aroused by them in the minds of the examinees.

Adjustments of School Work.—Many attempts have been made on the basis of mental measurements to adjust school work. Although the data furnished give great aid, it seems to have been pretty clearly shown that this information is by no means enough, that all the evidence available in regard to a child's general development and special abilities should be used also. Until we know a great deal more than we do now about child development in its totality, mental hygiene again emphasizes the wisdom of the experimental method with different plans in group tasks and grading.

Inadequacy of the Tests.—From the study of conditioned reflexes, the endocrine glands, the higher thought processes, and the attitudes and sets of the mind, we are coming to see that a great part of the child's personality may not be touched by the mere tests of intelligence.

All the best students of mental measurements agree with Terman that while the tests give results important for any estimate of a subject's grade of intelligence and ability to learn, data obtainable from other sources should always be utilized. The results furnished

by the standardized tests need to be interpreted in the light of supplementary information in regard to the subject's history, morbidity record, behavior and success in play, home environment, school, etc. And, as Burt has pointed out, an adequate estimate depends more on the psychologist or teacher than in the tests used.

Tests, infinitely more scientific than those set out below, can still be but the beginning, never the end, of the examination of the child. To take a young mind as it is, and delicately one by one to sound its notes and stops, to detect the smaller discords and appreciate the subtler harmonies, is more of an art than a science. The scientist may standardize the method; to apply that method and to appraise the results, demands the tact, the experience, the imaginative insight of the teacher born and trained.

The Problem of the Homogeneous Group.—Nietzsche's conception of a Utopia from which weakness, human sympathy, the defective and the weak shall be eliminated, misses the fundamental fact in human society and education, namely, the fact of stimulus. A world where there is a perfected mechanism, whether of the strong or the weak, is not a world of growth or development. It is not even a world of happiness. As James used to say, Herbert Spencer's ladylike tea-table elysium and the heaven described in the Sunday schools of our childhood are lubberlands one and all. Or Nietzsche's ideal of a social group of the superior without the handicap of the weak and the defective, as Chesterton has well pointed out, is an elysium of weak nerves rather than of strong minds.

Stimulus has sometimes come from the weak and defective. Although it is futile to discuss the matter, it is instructive to reflect what would have been the

course of education in this country during the last fifty years if there had been no defective or feeble-minded children. Such a condition, ideal as it appears at first sight, would have been a condition where many of the stimuli which have actually brought about many of the reforms in education would have been absent. Manual training, positive discipline, mental hygiene, vocational guidance, nutritional hygiene, and active education, largely, began with the feeble-minded and defective and were extended to the schools for the normal.

Although we should make the most of what information we can get of the intelligence and special abilities of our children in grading, classification, and the like, it may be well to remember that in this universe progress apparently has always depended upon change, variety of stimulus, whether in the climatic conditions of the cosmos, as Huntington suggested, or in the atmosphere of a rural school system.

If we deem education a matter of social training as well as of intellectual acquisition, it is still an open question how much of the training should be in homogeneous groups, those of equal ability, how much of it may well be in the more miscellaneous groups.

This much is fairly clear with our present knowledge. It is a great advantage for part of the work to be done in homogeneous groups where pupils work with other pupils of similar ability. This gives stimulus both to the superior and to the inferior; to the superior, because with their equals they are stimulated to do their best; to the dull and inferior, because, working with their equals, they are not discouraged. Part of the work, however, should be in heterogeneous groups for the variety of stimuli presented in such groups, the opportunity for the superior to help the dull, and the

social opportunity for the dull to work with the superior. In play, manual training, and the like this can sometimes be done.

Value of the Mental Tests

1. The mental tests are of value in controlling one's observation of a child's behavior. A child's response to the tests gives a control on the psychologist's observation. As a matter of fact, they furnish certain special occasions on which one can advantageously observe a child's behavior.

2. The standard mental tests furnish the means by which one's observation can be compared with observations of other children made under similar conditions. Thus a vast body of valuable data has been accumulated from which we have learned much in regard to the psychological age of children and its correlation with chronological, physiological, and social age.

3. Again, the mental tests, however defective and inadequate, are calling attention to the complexity of the problems of normal development, the danger of precocious, arrested, and unrelated developments, and the imperative need for adjusting education to individual capacity.

4. More concretely, the mental tests have shown their value in aiding proper adjustment of school tasks to those with whom teachers are apt to feel powerless and the gods themselves are said to fight in vain, namely, the stupid children. They save the dullards from failure by suggesting suitable tasks and giving a knowledge of special abilities, and often the bright as well by giving work hard enough to seem worth while.

5. The mental tests make it possible to discover the pseudo-feeble-minded as well as the feeble-minded, to

rescue the former, and give suitable training to the latter, and to make both useful and happy by proper training, where at least a large part of them before were doomed to the chagrin, unhappiness, and tragedy of continuous failure. Although it is true that those who make mental tests are liable to err, on the other hand, they are more likely to be correct by their method of observation under controlled conditions than the ordinary observer who does not have the aid of such objective methods.

6. Especially has mental measurement shown its greatest value as an instrument for the discovery of superiority. This is the really significant contribution. This is positive, a help to normal development, not a mere means of diagnosis of the defective or of the partial arrests in the normal. It promises definite and significant aid to normal educational and social evolution. This is so important that it should be noted more concretely.

The Two-Fold Contribution of Mental Measurement. —In the discovery of superiority mental measurement has made a two-fold contribution: first, in the discovery and study of superior children, work begun so brilliantly by Terman, Whipple, and others; second, in the study of the special abilities of children, work attempted already by scores of students. For mental hygiene both are important.

Mental hygiene, as we have seen, was developed first for defective and feeble-minded children, then applied to normal children; now the special need of it for superior children is indicated by the recent studies.

The frequent failure to understand superior children reminds one of the misunderstanding of the feeble-

minded in the old days. The case reported by Mrs. Dvorak may represent this class: *

Tom was 8 years old, in the third grade, a specialist in obtaining low marks, disliking school and feeling sick in the morning. Tested below the norm for the third grade. Was classified as "slightly below normal." The university clinic, however, in four different tests showed he was superior, with a mental age of 12 to 15.

The facts outside the tests were in part as follows: At 18 months Tom could supply words in nursery rhymes; in the third grade began systematic reading; the *Popular Science Monthly* was his favorite magazine, read also in Wells' *Outline of History*. Could retell stories he had heard six months before, played both alone and with his playmates, was of good physical development. His chum was a high-school boy. They worked a radio set together. All this was evidence from the outset that Tom was not below normal.

The Hygiene of the Superior.—The mental hygiene of the superior child is emphasized not merely by such children who are frequently handicapped by unfortunate inhibitions developed in pre-school life and are apt to be among the retarded children on account of lack of proper adjustment of school work, but also by the records of many great men and their methods of work and mental regimen, or lack of it. One thinks at once of Darwin, Byron, Huxley, Spencer, Wagner, and others, and their suffering and waste of energy from indigestion, eyestrain, worry about themselves, mental conflicts, or the like.

Naturally enough, mental hygiene for the most part has given attention to those on the lower level of health and efficiency, the ailing, the defective and neurotic.

* *Mental Hygiene*, April, 1923.

If equal attention were given to the superior, those who, in spite of physical defects and other handicaps are able to do important work, the outcome would well repay the effort.

The hygiene of superior children has not yet been adequately studied. Terman, in his noteworthy investigation of the superior children in California, will undoubtedly give attention to this subject. Until the results of such investigations have been made known, it would be premature to suggest a detailed mental hygiene for genius; but apparently a few general conditions are obvious. For them, especially, social training is necessary. Such children, like other normal children, may well be trained to obedience in a few things, but should for the most part be let alone in their early years. They should have varied opportunity for spontaneous doing of tasks suggested by a rich natural environment, varied stimuli, and the opportunity to react naturally and spontaneously to such stimuli. They should, above all, be given the opportunity for doing tasks adapted to their ability, and on the negative side especially they should be protected from unfortunate inhibitions, the development of a sense of inferiority, and, on the other hand, from an overdevelopment of individualism.

Special Abilities.—Equally important in the writer's judgment is the function of mental measurement in discovering the special abilities of ordinary children. Although special abilities often lie undiscovered and unutilized, it is noteworthy how largely the world's work has been done by the men and women of ordinary intelligence and perhaps some special talent, with whatever aid they could get from the two per cent with superior intelligence. At least for education the integration

of the special abilities of a social group is usually more important than the dominance of the group by a superior individual. That the utilization of such special talents is actually a matter of mental health is obvious from the fact that they give the opportunity for worth while tasks and for the group service that means social success.

So much for the mental measurements and the help they give toward the solution of the social problem.

Concrete Methods of Social Training

In concrete methods of solving the problem light comes from a number of sources. One of the earlier and most significant methods of actual social training was advocated by Dewey and put into practice in the public schools of Leipzig by Kerschensteiner.[18]

According to the view of Kerschensteiner, the work of the school, as far as possible, should be done in co-operating groups, so that the task may be a common task, success not an individual but a group success, failure not individual but group failure, and that actual social training may be given.

A number of methods used more or less extensively in this country aim also at giving social training. The project method, for example, largely attempts to do this, and under competent teachers obtains most praiseworthy results. The Montessori method has made the freedom of the child in doing his own tasks and actual social training its two-fold aim. The best modern kindergartens have done the same; and the Dalton plan, anticipated years ago by Swift, in his *Mind in the Making*, aims distinctly at both individual and social training in the doing of tasks. According to a formal statement of the Dalton Association, "it aims at giving the child freedom, making the school a community where the

mutual interaction of groups is possible and it ap proaches the whole problem of work from the pupil's point of view, giving him more responsibility for, and interest in, his education." The so-called method of socialization and the socialized recitation also aim to give actual social training in the scholastic work of the school.

A Great Part of Training Social.—From the point of view of the studies of the social significance of the conditioned reflex, we see that a great part of the training a child receives is not what we usually call intellectual, but rather social, training; and this is determined largely by the social dissimilarity of the members of the group. Fortunately in a group of the kind advocated by Kerschensteiner, *Arbeitsgemeinschaft,* a community of workers, we have all the members of the group united by a common purpose, all are working for the same end, and so the conditions are favorable for making the social relations congenial and for developing common conditioned reflexes and habits; and yet at first, at least, there are bound to be children with very different habits of behavior so that a great deal of social pleasantness and social unpleasantness and friction are likely to occur, as every teacher knows who has attempted to direct group work. The friction is perhaps as important as the common purpose.

The intellectual training to which we give special attention is by no means all; and thus no classification which takes account merely of differences in intelligence can be satisfactory. The individual differences in social habits, as well as the *mores* of the school group, if you please, must be considered if any satisfactory and truly scientific classification is to be made.

The Kind of Training.—What this social training should be in detail must be determined experimentally by the teachers in the schoolroom. The innovation of making every child in a group superior in something is probably possible in most cases in any group of normal children by the aid of proper tests of special abilities. That the integration of the abilities of the members of a group is possible, is shown in all the team sports.

Patri suggests for the social training of individual members of the group a kind of training that would be shocking to the extreme individualist. In one of his little essays in the daily paper he suggests the following exercises:

> For instance, wouldn't it stretch a child's soul if he were taught to halt in his race for knowledge and pull up the fellow who was falling behind? Say the child who was leading in mathematics, and was steaming ahead in pride and power and smiling approbation of the teacher, halted and took the hand of the chap who wasn't making the grade, and carried him with him over the top?
>
> Instead of the school honors going to the one who did the most for himself, let us give some to those who did most for others. Instead of commending the pupil who got the highest mark in the subject, commend the one who might have had a higher mark, but divided his strength with the fellow who was going under.

Group plays should have a large place. Johnson's slogan is encouraging:[17] "The problem of elementary education is not to put play into the curriculum, but rather put the curriculum into play." Groups of workers like Kerschensteiner's are always to be favored; and the method should be adapted to local conditions.

Superiority in the Group.—The aim, I take it, of all the best schools that put the emphasis on doing is to

make each individual member of a group superior in something. With careful study of special abilities, this is possible more frequently than many teachers suppose. Superiority in something that enables one to serve the group, gives social success and opportunity for a share in the control of the group, and calls for a leader who can integrate the superior abilities of the group members. It also implies that until one is superior in something one has no right to lead and control.

That superiority naturally does control and guide in any group is clear from observation. On the playground the boy who is superior in some accomplishment is always recognized as the one to give advice and guidance in regard to that particular thing, merely because of his superiority; and from necessity we recognize superiority everywhere in natural situations. I can take you, for example, into a forest in the country and place you where alone you will wander about and lose yourself, or I can give you a moron or defective as a guide who will take you surely and securely along a safe path to your destination. For the time being, for this particular purpose, and in this particular form of activity, the moron has the superior ability, and his ability is naturally recognized as having the right to control and guide your movements for the time being. Thus always superiority in any form of accomplishment or activity is recognized at once as the normal guiding and controlling factor. The obvious function of the leader, then, is to integrate the superior abilities of the different members of the group.

The Ideal Democratic Group.—In the ideal group, each member is superior in something; the leaders integrate the superior abilities of the members for a

common purpose, and the integrated superiority of the group controls and governs—a democratic aristocracy. Such an ideal group will be called utopian; but it is an ideal that has its roots in a million playgrounds, and is approximated in many team sports and clubs, notably in the amateur baseball nine, and in amateur musical clubs, orchestras, and the like.

Group Leaders.—In a normal group the leader does not dominate the different individuals, but rather integrates the various superior abilities of the individual members into a group superiority that really governs the group, the function of the leader being merely to integrate these different individual abilities.

Thus there are two kinds of group leaders: first, are those who by strength of character, by pleasing personality, and sometimes by the prestige of position or the like, are able to dominate the group and make each individual member exercise self-control, render service to the other members of the group, conform to all the rules, and in general be a docile and helpful follower, ready to take orders and subordinate individual interest to the interest of the group under the direction of the leader.

The other kind of leader is hard to find. Such a one is produced by training rather than developed by interest and intuition. His function, in the first place, is to note the individual talents of the different members of the group and give each the opportunity to become superior in something and then to integrate these abilities for the common welfare.

It is generally assumed that the former, the leader who has a pleasing personality, who can make people give up their own interests cheerfully, who looks after

everything relating to the group, and makes every one do the conventionally right thing, is a good leader. This is the kind that everybody wants in educational positions, this is the kind usually chosen. With such a leader everything goes smoothly, a perfect group machine is developed, and each individual plays his own little part in the group under the direction of the leader.

From our present point of view such a leader, however, is not the best leader, often is a dangerous leader; and in the spontaneous group activities of children not infrequently the influence of such a leader dominating a group is shown in large letters in the misbehavior, various forms of mischief, and not infrequently of crime, that appear in such groups. The same danger, of course, is connected with the group leaders in the school groups, camp groups and the like, where teachers pick out those boys and girls who are naturally leaders and allow them to control the group. Since such leaders by their pleasing personality easily control the group, teachers are apt to be pleased, and the evil results coming from the subjection of the individual members to the will of the leader and sometimes from the real tyranny of the leader, are overlooked.

If it should appear that the method here suggested from the point of view of mental hygiene is really the best method for democratic training, the result will not be surprising, for inevitably hygiene and democracy are intimately related. The only conceivable form of a normal democratic group is one where normal relations exist between the different members of the group, and the principles of mental hygiene are regarded in the leadership and control of the group.

Control by Integrated Superiority.—As Emerson said years ago, "every human society wants to be officered

by a best class, who shall be masters instructed in all the great arts of life." This ideal of government and control by the superior members of a social group has been the ideal of philosophers from Plato to Ludovici. The approximation of this ideal that is possible in the larger social groups is, of course, desirable. More than this, however, is a dream remote from reality because the superior man of the aristocrat's dream fortunately cannot be found. It is true, as modern mental measurements have shown, that many individuals of superior intelligence, geniuses, if you please, can be found, many even with superior intelligence combined with superior special abilities in many fields; but, if nothing more, the inevitable limitations of time and opportunity prevent these superior individuals from becoming expert in everything. Yet in any one of the larger social groups, like an ordinary community, rural or urban to-day, conditions are most complex, and the functions and tasks requiring experts are manifold. The only possibility of management by superior ability is by the integration of the superior abilities of many experts who owe their superiority in special functions to the development and special training of specific abilities.

The management of a social group by this integrated superiority of all the members of the group is the only means of realizing Emerson's ideal of direction of the group by the superior intelligence of "masters instructed in all the great arts of life." Such management is possible, and represents the natural reconciliation of the age-long conflict between aristocracy and democracy. It represents at once democratic aristocracy and aristocratic democracy.

The Democratic Ideal.—Democratic education consisteth not in the number or heterogeneous character

of the children in a class nor in having all children of a given chronological age study the same books at the same place and time, but in so adapting education to individual capacity that every child may have the opportunity according to his ability to become superior in something, to the end that each may be able to give successful service in a normal social group. As Dewey has said,[12] "Democracy will not be democracy until education makes it its chief concern to release distinctive aptitudes in art, thought, and companionship."

Many of the most thoughtful students are coming to believe that the hope of the world depends on the superior ability of the few. This is so near the truth it looks promising, but a near-truth that is so far from the real truth that it may be dangerous. It is doubtful if the superior abilities of the few will ever save society, but the integrated superior abilities of the many may do so. What is needed is a sound mental hygiene of social groups.

Conclusion

Such is the complexity of the problem of the social task, such the means of help in solving it. Whether the problem be that of your own child or that of the world task in this time of crisis, the answer for the present must be much the same—intelligent experimentation in the application of well established educational, hygienic, and economic principles, in actual social training, giving opportunity for many tasks, with a maximum of freedom, and a policy of letting alone when we do not know what to do.

For the somewhat alarming condition of the world group to-day 1,000 medicines have been prescribed. To

add one more matters little. Hence the obvious one from our present point of view may be mentioned. It is training by integration of the abilities of the social group, large or small.

This is a slow method; but it is well, however, to recognize that the only trustworthy basis for social progress and the only guarantee of permanence is sound social training. This insight may save us from premature and injurious experiments. Of course, a quicker method is grievously needed. With our universal faith in the potency of instruction, and the general belief that money can buy the best, many attempts at quicker methods are likely to be made. To foster such efforts in the world group Mr. Bok offered $100,000 for a working plan of universal peace. Such attempts to foster instruction are praiseworthy, and may, at least, stimulate the laggard steps of training, but the sooner we realize that there can be no great social progress until every man's child receives real social training, the sooner shall we lay the foundation for world peace and all our other social needs.

In the problem of the individual child the same is true. Nothing can take the place of actual social training in real and natural social groups.

If all this seems negative and inadequate, it should be noted that the recognition of the complexity of the problem and the experimental attitude give the best conditions for getting at the truth. With his attitude of the learner you are more likely to solve the problem for your own child or for the school group. And in any group, large or small, the opportunity for a task worth while, facing a task instead of running away from it, taking responsibility rather than evading it, and doing

service, represent the essential conditions of healthful mental development.

For the integration and self-preservation of the group, as we have seen, Simmel has pointed out the value of a group enemy. The common task of conflict with such an enemy has definite unifying power; nevertheless, for continuous group activity and the permanence of the group, a significant peaceful task is quite as good as warfare with a common enemy.

A task for everybody, and a right attitude toward one's tasks, both individual tasks and group tasks, with leaders who can integrate the individual abilities of a social group, mean social sanity and prosperity; freedom for each individual child to choose his own task and his own plan means the development of responsibility and initiative, and the adjustment of the child to his environment. Do you dare to give freedom to the individual child and to the social group? It is dangerous. Do you dare to let a child choose his own plan when your own is so much better, at least so much more interesting? Do you dare to permit spontaneous group activity as Scott does?[28] The scholastic product may suffer if you do. To such questions mental hygiene answers merely by another question: While it is dangerous to let children choose either task or plan, is it not more dangerous to prescribe?

To sum up the whole matter, from our point of view, of integration and adjustment as representing the fundamental condition of mental health, the essential of the training that develops these fundamentals when put in the simplest terms is the doing of tasks individual and social. The aim should be to make every child superior in something, and the social training should

integrate the separate superior abilities of the members of the group.

Summary

1. The problem of the social task is extremely complex. So many factors are involved that further experimentation is necessary before satisfactory principles of adjustment can be developed.

2. Study should be made of the conditions of the social task and of the relations of individuals to the social group.

3. The greatest difficulty in giving children opportunity for the right social training is the low stage of social education in the community.

4. Many sources of aid in solving the problem of the social task are available. All these should be utilized.

5. The study of all forms of development, physiological, psychological, social, moral, scholastic, and of the general development of the individual, is necessary to adjust tasks from the genetic point of view.

6. Tests of intelligence give the general intelligence level, but do not test emotion and special abilities.

7. Tests of special abilities and the data of vocational guidance should be used also.

8. The standard scales in different school subjects give helpful material, but from an educational point of view they have turned attention sometimes from the child to the scholastic product.

9. From the point of view of hygiene the standard scales are looked upon with suspicion as putting attention in an unwholesome manner on the artificial and conventional products, instead of on the mental attitudes so important for the mental health.

10. The great contribution of mental measurements to the social problem has been the discovery of superiority.

11. The great contribution of the intelligence tests in discovering superior children will be equaled perhaps by the discovery of the special abilities in ordinary children.

12. The ideal social group is one where each member is superior in something and the superior abilities of all the different members of the group are integrated for a common purpose.

13. Neither normal social education nor the normal development of the mental health can be expected unless a child has suitable opportunity for a social task and for social success.

14. Proper education for citizenship cannot be expected without the actual training of children in normal social groups with the opportunity for group service and the development of group loyalty and responsibility.

15. The group training given by Dewey, Kerschensteiner, and others suggests what can be done in the public schools.

Problems and Questions

1. Why is the problem of the social task such a complex and difficult one?
2. What conditions make it difficult for many children to achieve any social success?
3. Give from your own experience or observation illustrations of the value of social success as a stimulus.
4. What aids do we have for adapting social tasks to the ability and interests of pupils in the school?
5. Give concrete examples, if you can, where the results

of mental measurements have been of aid in adjusting group tasks.

6. Report methods of group training that you have seen or know about.
7. What have you noted of the advantages of training in the different school groups to which you have belonged, literary clubs, groups for special purposes, like orchestras, choirs, debating teams, dramatic clubs, the different team sports, or the like?
8. Report any good results you have observed in the use of tests of special abilities in vocational guidance or the like.
9. What are the social qualities developed in the different social groups you have personally observed?
10. Report, if you can, some social group where each individual has some special ability and the leader integrates the abilities of the individual members of the group for a common purpose.

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CHAPTER X

THE MENTAL ATTITUDES

The Significance of the Task.—To the question why a child's task is so significant for education and mental hygiene the answer briefly is because the task conditions the mental attitude.

By spontaneous activity in the doing of tasks of his own choosing, the child develops the rudiments of those attitudes toward work, toward life, and toward society that are fundamentally important for the mental health. Without this doing of suitable tasks, the child loses the golden opportunity for laying the foundations of mental health in the early years.

By continued training from childhood, in choosing tasks and doing them, a child not only develops healthful habits of attention and association, and, if rightly encouraged to carry tasks through to completion, receives the stimulus of success; but also by constant choosing of his own tasks the child gains ability in judgment, and gradually becomes better and better fitted to choose wisely, and later in life will be able to choose the best tasks, and, finally, some day will be likely to choose a great task to which a lifetime may be devoted. Some such great task has been the usual stimulus for most men of action and great achievement.

Mental Attitude and Mental Health.

The Significance of the Mental Attitudes.—Especially when the tasks performed are group tasks, the com-

plexes, interests, and attitudes developed are significant educationally and morally, as well as for the health and efficiency of the individual.

This group of associations, the association complex, if you please, developed as a result of the performance of a task, is the significant thing. This is, of course, made up of conditioned reflexes on the one hand, and of ideas on the other hand. Such complexes of associations give the interest in connection with the given task and prevision in regard to tasks of similar character. This prevision to a large extent represents the superior ability of the expert in the particular subject to which he has devoted lifelong attention.

Apart from these concrete habits of prevision and complexes of association connected with the special task and others of similar character, is also developed a mental attitude or group of mental attitudes toward tasks in general, toward work, and toward the school; and these more generic attitudes are themselves significant for the mental health, because they lead to the satisfaction of fundamental impulses and normal reaction to feeling.

Importance of the Attitudes.—Our mental life is largely made up of a kaleidoscopic variety of attitudes. We are accustomed to think of sensations and ideas when we speak of the mental life; but deeper than the life of sensation and of intellect is the life of feeling, and what we call for lack of a better word these attitudes. They are frequently referred to as the adjustment of the mind, or the set of the mind, or the like. In recent years attention has centered on the importance of these sets and attitudes. The investigations of the Würzburg school, and of Baird and others in this country have resulted in an important literature on this

subject. It is seen that they are specially important for the functioning of such mental processes as memory, association, and the like, and thus are vitally significant in determining thought and action.

Thus the mental world, to use the ordinary figure, is divided into two great hemispheres: on the one hand, sensations, images, ideas, whatever is present before the mind, what the Germans call the *Vorstellung;* and, on the other hand, that of organic and affective tendencies, attitudes, interests, what is inherent in the mind, what the Germans call the *Einstellung.*

The term *attitude* is not synonymous with the word habit; but every habit, it may be said, has its correlative attitude. Again the word *attitude* is not synonymous with *interest,* but a much broader term. Although every interest has its associated attitude, on the other hand, many attitudes are not expressed concretely in what are ordinarily called interests, but are largely unconscious. Habits of preperception enter largely into our interests, whereas the attitudes seem to be made up more especially of organic, affective, and kinæsthetic elements.

The Genesis of the Mental Attitudes.—The genesis of the attitudes throws light on their significance. Although it may be true that every idea, or *Vorstellung,* has its affective coloring, and even its attitude, or *Einstellung,* such concrete attitudes may be largely temporary. A permanent attitude, however, we may say, can originate in one of two different ways.

In the first place, a permanent attitude is the residuum, perhaps, of many repeated processes of sensation, perception, and feeling, and, as already suggested, the concrete attitudes may be fused together to form a more general attitude, like the attitude of the expert in any performance of skill. Thus Book, for illustration

found the more concrete attitudes formed during the early stages of the learning of typewriting fused later into a generic attitude called by the learner, adjustment or set of the mind, or the like.[8]

Second, a permanent attitude may be caused by a shock or a single intense initial reaction. Very noteworthy evidence of this is furnished by Ach's experiments on the will.[2 3] These studies have shown the desirability of intense effort. But Ach found that with an intense effort of the will an unusually intensive association, a mental attitude or determining tendency is formed, and thus an act of the will of this kind gives occasion for developing a permanent attitude, which may be one of persisting error afterward, or may be one of great help to the individual and go far to integrate the personality. A conditioned reflex can be formed by shock, as has been noted already, and with such a conditioned reflex a mental attitude is likely to be correlated.

Every individual has, of course, his own peculiar attitudes as determined by his experience and training as well as his original disposition. These are very deep-seated and fundamental things; and they, in turn, determine one's general behavior and even, to a large extent, one's ideals and aims. Thus these attitudes are formed by our reactions. They are modified by our reactions. Healthful attitudes on the one hand, abnormal and injurious attitudes on the other, are developed by our behavior in different situations.

The best way to develop a permanent attitude or a permanent interest is to do something. By attending to things, by doing things, interests and attitudes are inevitably developed; and among the strongest and most wholesome interests are those in our own work and our

various tasks. And thus an occupation represents a vital complex of associations and attitudes. It comes to be one of the most important things in an individual's character. It is almost a part of one's personality. Or, more accurately, it has been a great factor in integrating one's personality. Thus these attitudes are not merely a means, but an end. The great aim of education and of mental hygiene is the development of healthful attitudes and their integration in character. These attitudes, so important for the mental life, are perhaps equally important for the health of the individual; and so it becomes particularly the duty of mental hygiene to consider them. In order to make this clear, a few very simple and commonplace illustrations may be given. Examples can be found from almost every occupation in life, and everybody has had experience of them.

Variety of the Mental Attitudes.—These attitudes are of various degrees of concreteness. They vary from our general attitudes toward our work, our families, our occupations, and toward life in general, to the special concrete attitudes connected with special concrete situations. The more general attitudes are well known. Some of the concrete attitudes are equally familiar; for example, we have these in regard to our food, our clothing, and the like. With a slight change we may note them. When, for example, we walk upstairs in the dark, and failing to recognize we have reached the top, take another step in the air, or when we lift a pail or can, or the like, supposing it to be full, and it proves to be empty; or when we stumble over a threshold, because it has been recently repaired, or suddenly find our clothing torn, or the like.

First are the more generic attitudes that may determine one's behavior for a long period or a lifetime.

These generic attitudes toward life, toward work, and toward one's companions, are perhaps chiefly determined by heredity and one's innate psychophysical character; but they are conditioned also, far more probably than is usually supposed, by one's early reactions, by the associations, conditioned reflexes, and habits developed. But whatever their origin they are familiar to every one. Among them are one's attitude toward one's self, conceited or depreciatory; toward others, helpful or selfish; toward one's work, interested or bored; toward life and the world, aggressive or shrinking; toward the present, attentive or indifferent; toward the past, absorbed in it or forgetful; toward the future, optimistic or pessimistic; toward society, seeking it or shunning it; toward authority, yielding or antagonistic; toward nature, following it or fighting it; toward convention, obeying it or ignoring it. Involved in these general attitudes toward life are the distinctly affective attitudes, such as enthusiasm, depression, hopelessness, fear, courage, indignation, approval, affection, jealousy, amusement, curiosity, disgust, relaxation, strain, worry, confusion, etc.

Significance of the General Attitudes for Health.— These generic affective attitudes, these tendencies, are of vital significance for the efficiency of the mental life, and also they condition to a large extent the hygienic character of an individual's thinking.

The woman who said that the feeling of being properly dressed gave her a sense of confidence and satisfaction beside which the consolations of religion were as nothing, impresses me from a psychological view as being frank rather than blasphemous; for the attitude referred to is so deep and fundamental that in a certain sense it is like the religious attitudes.

Thus one's general attitude toward life and toward work is an important factor in determining one's mental health. Abbot, the well-known psychiatrist, thinks the failure to develop a right attitude is a great factor in conditioning a child's liability to the common mental disorder known as *dementia præcox*. He says:[1]

If this theory be true, or partly true, an indefinite number of persons may be prevented from developing dementia præcox, and certainly they will lead happier, more efficient lives, if they can be taught in childhood and youth to adopt more healthy attitudes toward life. The normal child plays happily or even aggressively with others, occupies itself with concrete and objective things and interests, takes the knocks and disappointments of life casually and without prolonged rancor, confides freely and openly with parents and companions; and happily substitutes another occupation for one that is forbidden or at the time unavailable or inadvisable. If, instead of this, a child keeps by itself; does not seem able to get on common ground with other children; gets absorbed in its own day dreams and fancies, and resents being called out of them; is sensitive and takes knocks and disappointments as slurs or injustices, resents them, broods over them and regards itself as a martyr; nurses its grievances in its own breast, not confiding its troubles to others but continuing the sense of injury and injustice; in general, keeps its thoughts to itself; and when its chosen occupation is denied it, goes off by itself with a sense of injury and does not try to take up another, but lets the mind dwell on unproductive fancies and vague, impractical aspirations—such a child is more likely than the others to have dementia præcox (pp. 6-7).

Innumerable illustrations of these attitudes are furnished by the relation of the physician to his patient. Every physician knows how important it is to have the confidence and intelligent coöperation of his patients. Every one knows, too, in the sickroom or the hospital, if nurses and friends become discouraged, how hard it

is to keep the patient in a normal frame of mind; and in many cases the attitude of discouragement aroused by an unfortunate remark or circumstance is enough to turn the scale between life and death. Physicians do not like to treat the members of their own families, because their attitude of care, solicitude, and affection, is so strong that their judgment may be biased.

The Vast Number of the Mental Attitudes.—Nowhere do we get better illustrations of these attitudes than in domestic life. Our attitudes attract our companions or repel them. Nothing is so hopeless among friends and relatives as antagonistic attitudes. It is not the words of Mr. and Mrs. Jarr, but their attitudes, that make domestic friction inevitable.

The attitude of the child at home is a different one from that of the child on the street. The attitude of the child to brothers and sisters is likely to be very different from the attitude toward other children in the school. The attitude of a child alone is very different from that of the same child in a group of other children.

More concrete, but still general, are hundreds of attitudes connected with our daily occupations. Every one has illustrations from personal experience.

Just as we have groups of habits for the different situations of our daily life, the places where we work, the streets where we walk, the rooms where we sleep, and the like, so we have correlated with these, groups of attitudes, habits plus feeling, perhaps. How numerous these are, how potent they are in determining and coloring our activity, we do not ordinarily realize. It is only when an unusual situation occurs that perchance we dissociate the attitude sufficiently to be conscious of it. That it is possible to do this, however, may be shown

by a very simple experiment which any one may try, for example, the following.

The Attitude in Contrast with the Idea.—After darkening your sleeping room, walk around a few times at random until you lose your orientation, then take your stand at a familiar object and attempt to go to a well-known spot in the room. The chances are that after a little effort at orientation you will have a definite feeling of the direction in which you ought to go, a definite attitude, a definite *Einstellung,* impelling to a movement in a certain direction. But if you think the matter over and reason out just the direction in which the desired spot must be from the familiar object with which you are in contact, the chances again are that your reason will tell you to go in quite a different direction. The interesting point of the experiment is the fact that here the attitude and the idea are dissociated and distinctly in contrast.

Most individuals have had this experience at some time of being thus twisted or confused when in the dark in their own rooms, and of the puzzling effort to go to a well-known door or piece of furniture, or the like. The feeling or attitude impels one to go in a certain direction and usually this is not the right direction; one knows a given object must be in a certain direction on account of its relation to another well-known object; and yet distinctly in conflict with this, one feels that it must be in a different direction. If one follows the affective attitude, one is likely to be surprised at finding himself wrong; if one follows reason, one may be surprised at finding himself right. It is the same often where one is confused between two ways at the turn of a road or path. One has an instinctive feeling that a certain direction is the right one. This may be right.

It may be wrong. But even with evidence that it is wrong one is reluctant to give it up. When the affective attitude is so impelling with so little at stake, it is little wonder that it is hard for any man to use his reason when the emotions are really aroused.

The Attitude Usually an Active Condition.—The word *attitude* is in one way unfortunate; for it suggests a relatively passive condition. On the contrary, in a strict sense, perhaps every attitude like other mental states is active. This may be illustrated by a well-known experience. Take the attitude one has who has just lost something and hunts in vain for it. It is a familiar article, we had it a moment ago, it has disappeared, vanished like the traditional shirt stud, and yet we are reasonably certain it must be close at hand. Our attitude is that of baffled endeavor, perplexed, always on the verge of easy achievement, and yet always balked. It is useless to hunt for it; it is nowhere. We try to give up the search and go about other work, but it is so obviously near at hand we have a prevision for it everywhere we go. We look for it in the most unlikely places. We imagine the most erratic impossibilities. Temporarily it becomes an obsession. This is distinctly an active attitude. Its intensity, too, is out of all proportion to the problem to be solved. Hence its futility. When a calm mood asserts itself, we are likely to find the lost object near at hand. A slight accident of arrangement, or the like, had made us overlook it in our strenuous efforts at something more remote and difficult. The attitude is much the same when a search is made for a forgotten word, or the like. The mind is so feverishly active in its search that natural associations are inhibited. The intensely active attitude of search is

not favorable to finding either in the physical or the mental world.

The Mental Attitudes and the School

Two classes of results are produced by education—what we may call the primary results and the secondary results. The primary results consist of what is actually learned in the different subjects and the skill acquired. The secondary results consist of mental attitudes and interests, what we may call mental development, and sometimes, unfortunately, arrest of development. For hygiene, and even for pedagogy, the secondary results are usually more important than the primary. The hygienist calls the secondary results attitudes, the teacher calls them interests, and the more unusual and abnormal secondary results are called by the psychologist arrests, perversions, bad mental habits, or what not.

The Results of School Work Are Attitudes.—Children carry away very little book knowledge from the schools. Every teacher knows this. But the attitudes and habits carried from the school are of vital importance, not only for efficiency but for health. The way the school determines attitudes is not merely by the school environment, the habits and manners of the teachers, but also by the whole course of study, and especially by the tasks set and the directions given to the children. A whole new pedagogy of the first importance is here involved. We have been so busy hitherto in teaching, in giving information, in imparting knowledge, that we have failed to see the significance of these deeper and more fundamental things that result from learning, these results of education that are really permanent, namely, these interests and attitudes.

Children acquire certain definite attitudes in regard

to the school and school work. Unfortunately, these are often attitudes of indifference or repugnance, which makes the school work appear not worth while and by no means comparable to work outside the school.

Take, for example, the children that in such large numbers leave school at the earliest possible moment and go to work in the factories and the like.

In 1909, Miss Todd took 500 children out of over twenty factories in different parts of Chicago, and asked them this question: "If your father had a good job and you didn't have to work, which would you rather do—go to school or work in a factory? Of 500 children between the ages of fourteen and sixteen, 412 said they would rather work in a factory than go to school.[21]

Miss Todd wrote down the reasons as the children gave them to her, and some of these suggest very clearly the attitude of the children toward the school and the great gap between the child's attitude and the teacher's attitude. Some of the reasons were as follows:

"Because you get paid for what you do in a factory." "Because it's easier to work in a factory than 'tis to learn in school." "You never understands what they tells you in school, and you can learn right off to do things in a factory." "They ain't always pickin' on you because you don't know things in a factory." "You can't never do t'ings right in school." "The boss he never hits yer, er slaps yer face, er pulls yer ears, er makes yer stay in at recess." "It's so hard to learn."

It would not be fair to infer that all children are such misfits in the schools; but many are. And, of course, in the better schools we do not hit pupils; but the weapon of the modern teacher of a certain type,

sarcasm—really a blow below the belt—is quite as likely as a whipping to produce an unfortunate attitude.

The General Attitudes Modified by One's Work.—Even the more instinctive attitudes are likely to be fixed or modified by the school.

A few familiar illustrations will perhaps help. Most children in a novel situation have what is called the instinct of curiosity, or better, perhaps, we may say, an attitude of curiosity. This is of great significance both for teachers and for parents. It furnishes the opportunity for instruction. The chief factor, perhaps, in curiosity is the desire for further knowledge. It is the attitude of the learner, it is really in part the attitude of the scientific investigator himself.

This attitude of curiosity, however, is easily modified, and may be changed into a very different attitude. First of all, for example, it is easy to change the attitude of curiosity into an attitude of fear. Whether it shall develop into the attitude of learning and intellectual interest, or the attitude of fear, depends on very slight changes of condition.

It is noticeable that visitors to the Agassiz Museum in Cambridge are often wont to be deeply interested in the row of skeletons that are exhibited to show the evolution of the human structure. The same is true of children. Perhaps one of the most interesting things to many of the children who visit the Educational Museum at Clark University is a human skeleton in one corner. The attitude is largely the attitude of curiosity. One day a little boy, perhaps six years of age, saw this skeleton and approached it, probably with mingled feelings of fear and curiosity; but one of our students at that time was present, noticed the boy's attitude toward the skeleton, and said to him: "This is some-

thing to show you the way the bones are put together in our bodies. You have in your own finger a little bone just like this, or yours will be like this when you grow to be a man. It is the same with this long bone of the arm, you have one that will be like it, and this is the way the different bones are joined together." Thus an intellectual interest, the interest of the learner, was developed which supplanted what was probably incipient fear, and this is likely to remain permanently with the child. Such an object which, without the development of this intellectual interest, might become an object of fear and terror is likely to become one of the most interesting things the child knows. The attitude of intellectual interest developed from the attitude of curiosity is the best antidote against the attitude of fear likely to be developed in such cases.

The attitude of fear and its sub-acute form of worry, as has often been shown elsewhere, are among the serious menaces to mental health; but parents and teachers can render children largely immune to fear by developing attitudes of interest, especially the learning attitude, out of the more fundamental attitude of curiosity. Especially is this true if older brothers and sisters have acquired this attitude and teach the younger children from their point of view.

Attitudes Easily Modified.—In like manner, the child's attitude of curiosity, the learning attitude which he normally presents toward every new subject, every new situation, can easily be turned into an attitude of disgust, and is liable to be changed into such an attitude if special care is not taken. Thus children often become disgusted with some subject in school work, because of the unfortunate methods employed by parents or teachers, or they may become disgusted with the school,

the Sunday school, with any form of work, or even with the routine of their home life. The balance between such attitudes seems often to be a knife-edge. Change from one to another is easy.

In like manner, these more instinctive attitudes are likely to be fixed or modified by one's daily work. In industry to-day the leaders are beginning to see the need of considering the mental factor and human interests and human values. In large part during the past, industry has made a colossal failure because it has considered solely or chiefly economic factors and material values. Now it is gaining the insight that the human element is significant in industry as well as elsewhere, and in many quarters to-day the great aim is to develop right attitudes in the workers, interest in the work, and, in general, to emphasize normal mental development. Thus a great new field in mental hygiene has opened, what was called by the late Dr. Southard, a pioneer in this field, the mental hygiene of industry. The child's work in school is equally significant.

Again the individual differences in human nature, and especially the differences between the child's world and the teacher's world, make differences of attitude inevitable. The child is naturally interested most of all in his own tasks and his own plans; the teacher often in an equally childish fashion in hers. There is sometimes antagonism.

The Attitudes Modified by the Home.—The attitudes children bring with them into school determine largely what they get from school work. If the parents express the idea that school work amounts to little, or that their children are not doing much, or if they criticize the teacher, or if the children do a large amount of work outside the school, then the work of the school may

amount to little. Miss Trumbull made a study of the last point in one of the high schools of Worcester, some years ago, and her results were very significant.[22] She found among 380 boys, 172 who were thus employed, and hence liable to be tired out when they came to school in the morning.

She writes:

> I once rebuked a junior boy for being abstracted and absent-minded in his fourth-hour recitation . . . and he blazed out a remark . . . the content of which was that he guessed if I got up at half-past two, and peddled papers till six, I would be stupid, too, when eleven o'clock came.
>
> . . . . But the worst display of temper I ever encountered on this subject was from a first-year boy, whose work was absolutely worthless. He was rebuked in class for his poor work and inattention, when he returned this appalling answer, that he rose at midnight and peddled milk till just time to get his breakfast and come to school, and if he could sleep in the afternoon he was going to, whether he knew anything about algebra or not.

Attitudes Significant for Learning.—In psychological experiments we come to close quarters with the attitudes significant for learning. In the laboratory, for example, one gets very different results according to the instructions given the observers. If we tell the observer to focus attention on the stimulus, we get a different result from what we do when we tell him to focus attention on the reaction. Again we are likely to get different results as we tell an observer to work quickly or to work slowly, as we let him see the progress he is making, or as we require him to work blindly.

Just as in the laboratory the attitude of the observer is determined largely by the instructions given, so in school we get different attitudes according to what we

tell children to do. If you tell children to learn a subject for a given purpose, for example, for the purpose of reciting it to the teacher, you will get different results from what you will if you tell them to learn it for the purpose of writing out a connected description of it, or for the purpose of telling it to their parents when they go home. Again if you tell them to do a task just as quickly as possible, you will get different results from what you will if you tell them to do it as slowly and carefully as possible; and if you tell them to learn a thing because you are going to give them an examination on it to-morrow, you will get different results from what you will if you induce them to learn it because they are going to use it a month from now; again you get different results if the material learned is going to help them to-morrow in doing something that they very much wish to do, say, for example, to make toys or other concrete things useful or desirable.

Again we get very different results if we interest children in the purpose of the various school activities, in the acquisition of health habits, for example, give them an intelligent idea of the results of their own work, and thus obtain an intelligent coöperation, from what we do if we impose tasks as a mere duty. In each case you get a different state of mind, a different attitude, if you please.

Attitudes on the Playground.—Of more concrete attitudes the playground and the schoolroom furnish plenty of illustrations. Men who have played in the great football games, for example, tell us of the tremendous nervous strain that accompanies what looks to be an easy play. The mind is set for a difficult play, and it does not shift easily to the unexpected easy play. They tell us that in difficult situations the player is often

likely to have a sort of stage fright, due to a confusion, perhaps, of attitudes. His mind is cast for a definite play, and it is often very difficult for him to do anything else. Thus a game like one of the ball games is the occasion of a variety of definite concrete attitudes.

The different plays, kicking, passing, catching a punt, tackling, in football; catching flies or grounders, and the like in baseball each represents a definite attitude or adjustment of the psychophysic mechanism; and this is demonstrated, not only by the introspection of the players, but the inability of the player to change instantly from one attitude to another. Brickley, the former Harvard football player, has given concrete instances of this, among which are the following:*

Catching a punt in the defensive back field in the face of a good pair of opposing ends . . . calls for the highest degree of concentration, and especially if the kick is high and apparently easy. Men who have played this position in a big game tell of the tremendous nervous strain that accompanies what looks to be one of the easiest plays in football. In baseball it is almost an axiom that the easiest play in a very critical game is the hardest to make. A very "soft" fly or the easiest sort of a slow grounder is most often harder to negotiate than the more spectacular chance. The mind is keyed to the most difficult sort of a proposition. It doesn't shift easily to the unexpected.

Tackling is another obvious illustration of the necessity of absolute concentration at a given moment. It is the easiest thing in the world to sit in the stands and watch one player chase another across the field, running almost neck and neck and yet not making an attempt to reach out and tackle. It is perhaps the most frequent exhibition of "freezing up" that football affords. The man in the stands nine times out of ten is prone to make the harshest criticisms. He doesn't realize

* *Boston Sunday Herald*, November 17, 1912.

that the player is trying his utmost to get his nerve wires into shape for the dive and clutch. He is just as much "cast" for the moment as the tumbler who finds that he cannot turn the somersault. His mind is "wandering" to an extent that makes it impossible to gather himself into the rather complicated operation of even the most rudimentary sort of a football tackle.

The Pupil's Attitude.—In like manner, the child in school work, in a recitation, for example, or in attempting a mental test, is cast for a certain definite mental reaction, has a certain definite attitude. Unfortunately, this attitude is apt to be quite a different one from that of the teacher or the one making the test. In any case, it is not easy for the child to change quickly from one attitude to another. The simple response is often extremely difficult for the child, just as the simple play is often the most difficult one for the ball player.

The child's attitude of response also is apt to be associated with a very definite situation, a very definite group of stimuli. It is not easy for him to transfer this to a slightly different set of stimuli. Miss Stevens has given a beautiful example of this.[18]

An Ohio teacher, as she reports the case, could not get the desired answer from a pupil, and finally exclaimed: "You know what I want you to say, Johnnie, why don't you say it?" The boy replied, "I know what you want all right, but you ain't asked the question what fetches it."

Illustrations of these attitudes are furnished by all the processes of learning. Book, for example, in his study of the learning of typewriting, found many examples.[8] As the learning proceeded, the fingers and hands came to be guided by what was described as a "set of the mind," "the right mental adjustment," or

the like. And "a change in attitude" toward the keyboard developed with increased ability in handling it.

Generic Attitudes.—Thus in every subject of instruction, in every occupation, for every social environment which becomes familiar to us, we are likely to have a group of concrete attitudes. Such a group of attitudes is likely to form a generic attitude, what we more loosely call an attitude in ordinary conversation. Thus we have the attitude of the expert in any occupation, the attitude of the clubman, the devotee, the member of a coterie, or faction, and so on.

These attitudes are fundamental in the education of the individual. They are also of fundamental significance in determining the mental health. The school produces such attitudes. Every subject probably contributes its hierarchy of such attitudes; and from the point of view of hygiene it is a matter of the utmost importance whether these attitudes are such as make for orderly thinking and serenity of mind and singleness of purpose, or whether they make for mental instability and dissipation and for worry or the like.

The Attitudes of Teachers.—The attitudes of teachers themselves are likewise equally important for their own health. To illustrate: there are two distinct attitudes found among teachers. To make the contrast between the two the more striking, let us take the extremes.

First is the attitude of the trained teacher in the school for the feeble-minded. The modern view of feeble-mindedness is that it represents arrest of development. Now in case of all of these, except, perhaps, some of the highest grade, it is hopeless to expect any further development in psychological age. The child will always remain a child of three, or six, or nine, as the case may be, though he reach the chronological age of fifty. Con-

sequently, the method adopted by teachers of the feeble-minded is, I understand, as follows: They never blame the children, but always praise them for any effort that they make, for anything that they do, however crude and clumsy and imperfect the product, and, above all, they attempt always to make them happy, both by the surroundings and by the methods of instruction.

The aim is to make the feeble-minded child, as far as possible, a normal for his age, without any expectation of further development, to make a perfect happy child of three or six or nine, as the age may be. The method represents the teacher's attitude. It is one of thoroughgoing sympathy with the child as a child.

I am not concerned to discuss the problem whether it would not be wise to adopt this method in all schools.

In contrast with this attitude of the trained teacher of the feeble-minded is the attitude of the ordinary school-teacher of the older type—the teacher who aims at perfection, who desires to impose adult knowledge upon children, who tries to develop adult virtues at the earliest possible moment, who is impatient at slow progress, who always keeps in mind the ideal of perfection, who sees every fault, and every defect, and spends most of the time in pointing out these defects. This is the attitude of the reformer as such.

These extremes represent the attitudes of the reformer and the lover. The reformer sees faults to be corrected so vividly that he is blind to virtue, the lover sees virtue so clearly that he is blind to faults that need correction. There may be difference of opinion in regard to which of these attitudes is more useful, and which is more pedagogical; but there can be little question in regard to which is more healthful for the teacher.

The tragedy of it all is that the reformer does not

acquire the keenest possible vision for defects except at the expense of a certain loss of ability to see virtue and even to see things as they are; and thus it comes to pass from an hygienic point of view that the reformer can never take a vacation. A vacation is a state of mind, an attitude, not a situation; and since there are always imperfections and defects in this world, one sees them wherever one goes, and those whose business is reform cannot possibly leave their work.

For professional men and women and busy men of all occupations, it is a great protection against overwork and anxiety if one can take the vacation attitude of mind. If you ask me what this vacation attitude is, I know nothing that illustrates it so well as a child doing his own task in his own way with freedom to leave it or do it at will.

Unfortunate Attitudes.—The meaning of the mental attitudes for education is obvious. The danger from the development of unfortunate attitudes is the tragedy of education. To describe them all would be to write the history of human behavior. Even in the narrow field of formal education the significance of right attitudes and the misfortune from unpedagogical and unhygienic attitudes is hardly dreamed of by the ordinary teacher. In such a matter as the learning of language, for example, the attitudes developed are largely the things of permanent significance. A single illustration will suggest this. A former student writes of the attitude developed in his own experience as follows:[14]

In college I studied my texts in foreign languages primarily for the purpose of being ready for translation in class. As I gained some familiarity with the languages studied, I acquired the habit of reading merely to make sure that I could translate when called upon. Only passages or words that required

working out or looking up attracted my attention. Passages that contained no difficulties were passed by with a sort of subconscious comment, "Yes, I can do that"; and without thought of the subject-matter. The result is that since my college days, now that I read for subject-matter, I find it almost impossible to get any connected idea of the content of a book in a foreign language until the second reading, and often the easier the text, the less I get. I acquired in college what Thorndike calls a "habit of neglect"—learning to neglect the subject-matter, because class-work made no call for it. And the habit has stubbornly persisted in spite of constant effort to break it up.

Healthful Results of School Work.—From the point of view of mental hygiene what are the results of school work? What are the attitudes developed by the work and environment of the schoolroom? Under the best conditions they are distinctly healthful; but many things tend to develop unwholesome attitudes and habits. It would be a long story to recount them; but with the overheated rooms, with impure, dry and stagnant air, with bad odors and dust, with prolonged periods of work without recess, with improper grading, with dawdling and slovenly methods of learning, time is not merely wasted, but worse than that, unwholesome attitudes are developed.

Thus we can have no adequate mental hygiene until the school is reorganized and attention given to the hygiene of feeling and to those fundamental attitudes and habits that favor normal mental development and mental health, and until the school, instead of being a place where worry, confusion, and mental strain and habits of nervousness are liable to be developed, shall become a refuge where parents may send their children when threatened with nervous breakdown or mental disorder.

The Attitude and the School Method

In every method, as well as every school subject and occupation, the appeal to the child's normal mental attitudes and the development of right attitudes in proper sequence should be the aim. In some of the best schools to-day one of the greatest advances in school-room practice is the recognition of the significance of the mental attitudes.

The Mental Attitudes in Reading.—No better illustration of this could be chosen perhaps than Parker's general method for teaching reading, a method that has made beginning reading the road to fairyland.[16] The work begins with pre-primer blackboard and chart reading. The first principle concerns the necessity of giving the pupils a correct attitude toward the reading material and by avoiding wrong attitudes. For example, the child should not be permitted to form the attitude of merely trying to pronounce words without regard for their meanings. The right attitude differs with different types of reading material. It is different for poetry, for humorous material, comic features in the newspapers, and for Lincoln's Gettysburg address. Children easily learn to recognize short phrases as wholes, an important reading attitude. The pre-primer reading should initiate the attitude of trying to get meaningful and interesting content from printed material. From this beginning the needed variety of attitudes for different kinds of reading and different purposes, and finally, the attitudes of permanent interest may be developed; but the first stage is intended to initiate attitudes and habits which may persist throughout the pupil's later reading.

The recognition of the significance of the attitude in

school work marks a great forward step both for education and for hygiene; emphasis on the attitudes in school work by practical methods has been attempted not only by Parker in special methods in teaching reading, but by Kilpatrick and others in general methods; and the recognition of the significance of the attitude in mental hygiene has been made by many psychiatrists. The significance of the attitudes for the health of the pupils in school work is perhaps as great as its significance for education.

Pressey in a study of the relation of attitude to school work finds a high correlation of school attitude with the marks, and makes the following tentative conclusions:[17]

> Perhaps the gist of the present study may be summarized as follows: (1) If the elements contributing to a child's success in school are to be adequately understood, not only a child's ability or intelligence but his attitude toward his school work—his industry, his interest, and his deportment —must also be taken into account. These factors appear to be almost as important as a child's purely intellectual capacities in conditioning his success in school.

Attitudes Developed by Doing.—The most generic attitudes and the most important for the mental health —those toward one's own tasks, one's rest and recreation, one's fellow men, and toward life—are developed by the doing of a multitude of concrete tasks and the integration of many concrete attitudes. We develop significant attitudes—attitudes for each of the social groups of which we are members, for every subject we study, for every task we perform, for every situation we meet. In children, especially, perhaps, in adolescents, in some adults who are hopelessly adolescent, there is likely to be confusion and conflict. For the mental

health, integration of the conflicting attitudes is necessary. The best means of integration, as we have noted, seems to be the development of some central interest or great ideal by the doing of some significant task.

The Aim of Education.—Thus the recognition of the significance of the mental attitudes is the key to the modern psychology of education and society. The aim of education is the development of right attitudes and interests. A liberal education, as President Eliot has pointed out, is a state of mind. Civilization is a state of mind. Peace, for which so many everywhere are working, is a mental attitude. More concretely, in every subject of study and every field of education, the important thing is the development of certain attitudes; in hygiene, for example, the attitude of prevention, the attitude of emphasizing positive habits of health, etc.

Of course, it may be said that this is merely a point of view and gives us nothing very definite and concrete. It is really more than a point of view, but even merely as such it is of great importance; for one's point of view determines what one sees, it determines whether one sees clearly or not, it determines whether one sees things in right perspective or not.

Summary

1. The mental attitudes, permanent interests, and habits of study and of thought acquired in the school are the significant things.

2. The mental attitudes are also important conditions of learning.

3. One of the greatest advances in modern education is the recognition of the great rôle of the mental attitudes and sets of the mind and of the necessity of appeal to

these attitudes, making them both the beginning and the basis of instruction and training, and also the aim of education.

4. Attitudes, like conditioned reflexes, are produced in two ways, by repetition and by shock, but usually by the natural repetitions involved in the doing of tasks.

5. The attitudes developed in any subject, and by any task or form of learning, are important for the mental health as well as for education.

6. The conflicting attitudes developed in different situations and in different social groups should be integrated in one general attitude toward life. This seems to be accomplished by some central interest, or great ideal, or the like.

Problems and Questions

1. Report any difference that you have noticed in your own mental attitude when you have a definite task to perform and when you have nothing particular to do.
2. What results from the performance of definite tasks have you noticed in people with respect to their happiness, health, and the like?
3. Report any experience you may have had where in school work, or at an examination, or in plays and games, you have been unable to succeed, apparently because of an unfortunate mental attitude.
4. Report instances where you have observed that your companions treated you courteously and were helpful, but showed a mental attitude that spoiled your pleasure.
5. Report cases where you have observed teachers or others unable to get on with children because of unfortunate mental attitudes.
6. The teacher of the feeble-minded praises them for whatever they do. Comment on this method.

7. Report, from your reading, where unfortunate mental attitudes have made coöperation in important tasks impossible.
8. Report instances you have known where a ball game or the like has been lost because of the discouraged or overconfident attitude of the team.
9. Report methods you know where the aim first of all is to develop right attitudes in the pupils before beginning the special instruction.

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CHAPTER XI

SUGGESTION AND EDUCATION

THE innate and universal tendencies have been described by Watson, Thorndike, and others. Naturally the number given varies according to the point of view of the writer, some psychologists differentiating a larger number than others. Watson is inclined to believe that we are originally endowed with various kinds of positive reaction tendencies, but with few negative reaction tendencies, the latter being the avoidance of loud sounds and objects, the attempt to escape from objects that excite fear and rage, and means of defense against any object or person that seems likely to injure one's bodily tissue.

Besides these are the great number of tendencies developed by our reactions, by our tasks in the broad sense. These, in turn, determine our responses. They are active attitudes. How these are conditioned by the task or goal-idea is well illustrated by Titchener:[43] *

Suppose, for example, that the stimulus consists of the figures 6 and 2, divided by a vertical line—6|2. According as the task prescribed is addition, subtraction, or division, the ideas reproduced by the stimulus will be 8, 4 or 3; the *Aufgabe,* the *Zielvorstellung*—itself unrepresented in consciousness—has raised to supraliminal intensity the single reproductive tendency that accords with the purpose of the observer. "These dispositions, unconscious in their operation, which take

* From E. B. Titchener, *A Textbook of Psychology.* Reprinted by permission of the Macmillan Co., publishers.

their origin from the meaning of the idea of end and look towards the coming perception of object—these dispositions," says Ach, "that bring in their train a spontaneous appearance of the determined idea, we call determining tendencies."

Or briefly, in less technical language, the task we accept sets free certain dispositions that we call determining tendencies.

Thus human personality is made up of a group of determining tendencies, some native, some acquired. Where all of these are integrated in one personality, we have a normal individual. Obviously, education and hygiene have to do especially with the development and integration of these determining tendencies. For this purpose, in the terms of our fundamental principle, we may say that optimum stimulation and response are necessary; and education and hygiene should give opportunity for this.

We are now prepared to consider the significance of these tendencies for the teacher and the hygienist. These are the background or basis for education, whether for health or for scholarship. The method of sound education, whether natural or formal, is suggestion—autosuggestion when it comes from one's self, heterosuggestion when it comes from something else.

A Working Definition.—It has been unfortunate that the view of suggestion generally held by mental hygienists, and even by many psychologists, has been unnecessarily artificial and complex. At least for mental hygiene, all that is necessary is to note the simple and essential significance of suggestion. It has been expressed admirably by Titchener who defines suggestion as "any stimulus external or internal accompanied or unaccompanied by consciousness, which touches off a determining tendency." This definition at once relates

suggestion to the sensory stimulus and brings the whole matter of suggested behavior under the general relation of response to stimulation.

Titchener uses the illustration of the reaction experiment:

> What sets up the readiness to accept instruction? A foregone suggestion: the observer comes into the laboratory in order to be instructed, prepared to take orders. What brings him into the laboratory? Another foregone suggestion: the desire to learn psychology, the fact that some of his friends have decided to come in. What led him to choose the particular course that includes psychology at the university? What led him to choose this particular university? What led him to enter any university? All these results are due to suggestion, to some stimulus or situation that starts up determining tendencies.

This simple view of suggestion is all that is necessary in considering the subject in relation to mental hygiene. And to appreciate the far-reaching significance of suggestion as a method in education and as a means of encouragement, and sometimes of cure, in psychiatry, one needs no subtle theory of the unconscious, or complex conceptions in regard to expectation, subconscious realization of ideas, and the like. As a matter of fact, since the stimulus that touches off the determining tendency may be either internal or external, either suggestion or autosuggestion, either conscious or unconscious, this is sufficient as a working definition; and, as usual in mental hygiene, the simpler the explanation of a mental process the better.

Autosuggestion

"Know thyself" was a maxim of the ancients. If one can know himself, and the various determining

tendencies, innate and acquired, bound up in his own personality, and if, further, one is able to provide the right stimulus, he can touch off these determining tendencies quite as well as another individual can do this. In this case we have, of course, autosuggestion.

In some ways it is easier for an individual to know himself, and his own determining tendencies, than it is for another person to become acquainted with these tendencies. In some ways, however, it is more difficult for one to know his own tendencies. On the other hand, an individual may be able quite as effectively to provide the necessary stimulus himself, in other ways it may be much easier for another person to provide the necessary stimulus; but other things being equal, it may be better for the individual to do it himself. Thus just as self-education, or auto-education, as the English call it, is in large degree better than education forced upon the individual by another, so autosuggestion may often be better than heterosuggestion. In any case it is a question of providing opportunity for optimum stimulation and response.

Self-Education.—In one respect self-education and autosuggestion are especially significant because such forms of self-activity place the responsibility upon the individual himself; and if one gets the necessary self-knowledge, knowledge of his own tendencies, and of the stimuli necessary to objectify them in action, the feeling of responsibility for this form of education is itself a factor in development. The danger is, of course, that the development will be extreme individualism, that normal social stimuli will not be given adequate opportunity, and only a few of the tendencies of the individual will be stimulated into action.

Children, as shown by the results of general observa-

tion and special investigation, seem to be more open to suggestion than adults. Naturally this is so, since from their relative lack of experience they are more free from inhibiting associations than adults. The aim of the school is a systematic attempt to develop associated stimuli facilitating or adjuvant to the tasks of the school and inhibiting to injurious and distracting tasks.

Suggestion in the School.—Next to the teacher, the other children, in many schools more than the teacher, constitute the most important stimuli in the school. Obviously, the teacher's business is that of learning the determining tendencies of a pupil, both the innate and the acquired, and of providing opportunity for the proper stimuli, either in the child's spontaneous activity, in a rich environment, or by judicious use of the necessary stimuli to set free the determining tendencies that make for health and normal development. In other words, the teacher's function is suggestion, that is, the setting off of certain determining tendencies, the inhibiting of others. There is always a danger that it will be unduly negative and inhibitory. To attain the right balance for each individual child is the work of the master teacher.

Here the great problem in education and mental hygiene confronts us. What is the right relation between suggestion and autosuggestion? How far should a child be trained to respond to the suggestions of other people and the things in the environment? As already noted, we are surrounded from birth with all kinds of stimuli, most of them those that tend to arouse conventional responses. These usually represent the wisdom of the race and are tremendously important in hygiene and education. It is the function of the school to develop them. Hence those who are well trained, as we say, are

largely trained for convention, they become mechanisms for such conventional responses.

Conventional Training.—Since convention usually is an economic device, such training usually means efficiency for ordinary activities. This conventional training, to be sure, integrates the personality, but on a relatively low level. For the integration of a personality on a higher level, for the development of individuality, something much more than this is necessary, at least special care to avoid overorganization on a low level and to give opportunity for development on a higher level. The great problem is how to get the advantages of organization and conventional habits of response to usual situations and at the same time preserve the freedom necessary for higher development.

With our present data no satisfactory solution of this problem seems possible. The general answer to the question may well be somewhat as follows: train a child to be conventional in all unessential matters and the usual details of behavior, but give freedom to follow nature as expressed in one's own individuality in the great things and the essential matters of life. To the question what these essentials are, only a general answer can be given. This answer, however, is pregnant with significance. Clearly, five things are included among the essentials, those represented by the words: health, scientific truth, conscience, honor, and one's own task. In regard to these five essentials a maximum of freedom should be granted. Only in this way can integration of the personality on a higher level be assured.

Suggestions in Regard to Health.—To-day a child is surrounded by all sorts of stimuli that are likely to act as suggestions in regard to health; not merely the superstitions and maxims current in the family and other

social groups, the general doctrines of the newspapers and the other literature in regard to health, and, for some sensitive children, most of all the examples of defect and disease that one sees; but also the direct teaching and training of the home and the public schools in regard to health. To most of these stimuli it is necessary that one should become immune. Few things are worse for a child than to become self-conscious in regard to his own health; and especially unfortunate is it if the teaching in regard to hygiene touches off that universal determining tendency to be overanxious and overcareful about one's self and one's own condition of health. One who becomes a health pedant in childhood is likely to become a neurotic as he grows up; and for many adults it is true, as Mr. Lee has expressed it, that the one thing above all else that they need, is to forget about their own health. Plenty of concrete illustrations are furnished in the home and the school.

Suggestion and the Conditioned Reflex

Our definition of suggestion as any stimulus that touches off a determining tendency includes, of course, conditioned stimuli as well as biologically adequate stimuli, and, as a matter of fact, perhaps most stimuli that set free determining tendencies are associated stimuli. Hence it is often helpful to consider cases of suggestion from the point of view of these studies of the conditioned reflex.

How largely many ordinary cases of suggestion may be plausibly explained as conditioned reflexes, may be illustrated by a classical instance of what has always passed as a representative example of suggestion in its effect on physical comfort.

An old story often told, but never probably better than by Gillet, runs as follows:

An asthmatic, on a holiday journey, was awakened in his hotel by a violent paroxysm of the disease.

Greatly distressed for breath, he got out of bed and hunted for the matches. He had a craving for fresh air, but could not find the window. "Confound these third-rate hotels, where one gropes vainly in the dark!" He is suffocating, and he clamours for air. Feeling about, he at length finds a pane of glass. "Damn it all, where's the window bolt? . . . . Never mind, this will do!" and he breaks the pane. The fragments fall to the floor. Now he can breathe; again and again he fills his chest with the fresh air; the throbbing at his temples passes, and he goes back to bed. "Saved!" . . . . Next morning, one of the items in his bill was, "Broken clock-case, fr. 4.35."

The ordinary explanation of such cases, of course, is to say that it was due to imagination or due to suggestion with the implication that the physical discomfort and abnormal physical condition still remained, but was unnoticed on account of the man's imagination. We come to closer quarters with what actually happens in such a case by noting that it is merely a conditioned reflex; and the physical relief, the relaxation of the muscles and the like, undoubtedly real.

This is a simple and illuminating example of an ordinary conditioned reflex. The stimulus of the cool, fresh air in the man's experience had been followed by the reaction of a system of reflexes giving relief, relaxation of the muscles, change in the circulation and the like. In this experience the opening of the window had become a stimulus associated with the original stimulus of the fresh air and so was able to bring about precisely the same biological effect without the original or unconditioned stimulus, so that the man's relief was as

definite and real as if a window had actually been opened.

No adequate account of so-called psychic contagion or of the various phenomena of imitation can be given without considering these also from the point of view of the conditioned reflex. The various epidemics of hysteria and the like among school children, of which we have now many records, are, at least in part, due probably to the formation of conditioned reflexes.

A great part of the cases of suggestion are really cases of conditioned reflexes. Pavlov maintains that the only fruitful method of studying hypnosis, which is a condition of extreme susceptibility to suggestion, is from the point of view of the conditioned reflex; and he looks upon hypnosis as a condition of partial inhibition. The cures of nervous disorder and the like are often best explained from the point of view of the conditioned reflex.

Although we may with legitimate heedlessness use the ordinary language in regard to suggestion, we should keep the simple facts clearly in mind. Children bring to the school a bundle of determining tendencies, innate and acquired, instincts, conditioned reflexes, inhibitions, habits, if you prefer. The suggestions of the teacher, the other children, the school as an organized group, the schoolhouse as a place of confinement or of opportunity for work and play, are the stimuli that set off these tendencies.

Suggestion and School Hygiene

In all matters pertaining to the health of children suggestion is an important factor. Observation has shown that many nervous disorders are contracted by psychic contagion. Stuttering is likely to increase when

children enter school because the neurosis is spread by psychic contagion. Chorea, hysteria, and the like, are often spread by imitation and suggestion. A German eye specialist has reported that among the many cases of eye defect among children that he has to treat every year, he usually finds a few cases of purely functional myopia which are cured by providing the child with plain glasses or even with a spectacle frame with no glasses. Suggestion is recognized as one of the causes of suicide among children. All sorts of fads, whether hygienic or unhygienic, moral or immoral, are likely to be spread by the school.

Thus certain forms of mental and nervous disorders may fairly be reckoned among the contagious diseases. They are spread not by germs but by psychic contagion. Isolation of the pupils and school closure may be just as necessary as in case of measles and scarlet fever, although frequently it is better to continue the school. In any case a scientific mode of treatment in such epidemics is important. A number of epidemics of such disorders have now been reported. In many of these the chief symptoms are some form of hysterical convulsions; and imitation and suggestion seem to play an important part.

In still more subtle ways pupils give suggestion to each other—in matters of discipline, in the ordinary class recitation, in plays and games, in fact, in all the associations of school life. Every teacher could report cases where some bad habit of pronunciation, or the use of certain improper words, or other bad habits, have spread like epidemics when once started in the school. The examples cited merely show in large letters the force of suggestion which is always present where children

are together, a force to be considered in all methods of discipline and instruction as well as in hygiene.

Studies of Suggestion.—A number of studies have shown the great rôle of suggestion in ordinary school life. If one child becomes especially interested in a subject or a project, other children are likely to become interested also. If one child misbehaves, the way other children follow the example is too well known. As already noted, a large number of hysterical or similar nervous disorders among school children have been explained as examples of suggestion. Many borderline cases and a vast number of more or less pathological phenomena, epidemics of fads and the like, illustrate similar conditions. One or two simple illustrations may be cited.

Of a group of girls between the ages of seventeen and twenty the following report is given: "The lesson for the day was not well prepared by the class. The teacher was exasperated and spoke some sharp words. At the close of the lesson a girl had hysterics and, five minutes later, seven others were affected."

Of a group of boys it is reported: "A *jumper* (so-called because he would jump or speak when touched or addressed suddenly), once went to a school that I attended. Before he had been there half a term, five or six of the boys were very bad jumpers."

The following, reported by Small, is a fairly typical case:[87] Among a group of girls about twelve years of age, "L . . . had an attack of hysterics in school. While watching her, several other girls began to show the same symptoms. L . . . was carried from the room and the teacher threw water in her face. The same treatment had to be used with several others."

A case of this kind may be explained simply some-

what as follows: The girl first attacked probably experienced some personal stimulus sufficient to cause the hysterical reaction. The other girls, seeing her, naturally would react to the stimulus, more or less of a shock, either by fainting or by a repressed reaction of fear or by showing similar symptoms. For children of neuropathic tendencies, the most natural form of reaction might well be the one observed in their companions, hence the spread of the attack to the others.

A simple case is the following: Among a group of children from ten to fourteen years of age "one little girl had a spasmodic cough. Her laughter always ended in a fit of coughing. In a short time the majority of the children in the room began to cough in the same way They could not seem to help it."

Here again a simple explanation is fairly obvious. The spasmodic cough of the little girl served as a stimulus to her companions. To this stimulus they must react in some way. Naturally for most children the obvious form of reaction would be the same kind of a cough. Soon conditioned reflexes were established and the cough was conditioned by sight of the girl afflicted or even by the sight of the schoolroom.

Imitations of Disease.—Frequently the imitation of some disease occurs, and sometimes a part of the cases are those of the real disease and some are a sort of pseudoform or a mere imitation. Terrien has maintained with many illustrations that hysterical diseases of most varied forms are only imitations of definite diseases which the patients have at some time had opportunity to see. The mere description of a disease in the presence of an hysterical patient, as he shows by illustrations, is sufficient to call forth an hysterical imitation of the disease.

In certain instances we have cases that are closely analogous to the mere fads that are liable to run through any school, cases which are distinguished from the strictly pathological by the fact that there is often no neurotic inheritance and the disease occurs in an otherwise healthy child.

In 1895, Szegö reported an epidemic in an orphan's home for girls at Budapest.[84] Among forty-five children five became ill with a peculiar cough. Bókai reported in regard to an epidemic in a girls' school where fifteen girls of the age between nine and fifteen had a similar trouble. They imitated the noises made by different animals, for example, some the baying of a hound, others the sounds made by a horse, a parrot, and a goose.

School Epidemics

From a number of instances collected by the writer, some of the more serious school epidemics are the following, cited chiefly from the German periodical devoted to school hygiene, the *Zeitschrift für Schulgesundheitspflege.*

The Gross-tinz Epidemic.—One of the earliest reported epidemics of this kind occurred in Gross-tinz near Liegnitz in Germany in 1892.[47] The first case appeared on the 28th of June, when a ten-year-old girl without apparent occasion began all at once to tremble in her right hand and then gradually in the whole body, a condition which passed off in about half an hour without any further results. On the next day the trembling appeared in several other girls and lasted from half an hour to an hour. Not the children sitting next, but those several seats away were affected. The trembling returned regularly each day and began to last longer and longer, and the school instruction soon suffered be-

cause the girls who were attacked could not write. One day at the beginning of July one of the trembling girls was attacked with convulsions and fell under the seat. Although the teacher immediately removed this child from the class, several new cases of convulsions soon appeared among the healthy girls, and on the 19th of July the number of victims was twenty. During the period from the 14th to the 20th of July the instruction was equally exciting for both teachers and pupils, and presented a noteworthy picture to the medical observer. On almost every seat were patients having convulsions of the whole body. The girls fell under the seats and had to be carried from the room by the boys, and the attacks continued for different periods of time between a quarter of an hour and an hour, when they gradually ceased. Besides, it was noteworthy that during the attacks eight of the girls lost consciousness, and after waking up knew absolutely nothing of what had happened. The coming of the summer vacation on the 27th of July brought the epidemic to an end provisionally, after 38 girls had already been excused from the instruction on the 20th of July. The vacation lasted until the 19th of August, and all the children returned to school at that time. Instruction was taken up again, and there was no complaint about trembling, but several children complained of violent headaches, which were so severe that the girls had to be sent home. After the autumn vacation, when the school began again on the 20th of October, the old freshness and joy in learning returned in the case of all the pupils, it was reported.

An Explanation.—This is a typical illustration. Many such epidemics of hysteria among school children have now been reported. The obvious explanation is a sim-

ple one. Naturally we may conceive it somewhat as follows:

One child, from some form of ill health or unfortunate circumstances at home, or the knowledge of hysterical phenomena by observation on the street or in some group of children, has an attack of hysterical convulsions or the like; and another child, coming into the schoolroom sees this patient suffering from the attack, is shocked or frightened by the sight, and the natural response to the strong stimulus of the situation is either to run away or cry or faint or fall into similar convulsions, or any one of a number of possible reactions. For many children the most natural form of reaction would be that of which they have a concrete example before them, namely, the same kind of hysterical convulsions or failure of consciousness or the like. In this simple way the epidemic spreads to all those children of sufficiently nervous temperament to be susceptible.

In many cases probably, by the shock and associated stimulus, the sight of the schoolroom, the sight of a certain spot in the room, possibly the sight of the teacher, or any one of a number of stimuli connected with the particular situation, may become associated in the child's mind with the sight of the suffering child and become an associated or conditioned stimulus that will condition the same reaction, that is, the same hysterical attack, whenever the child comes into the room thereafter. Hence the great advantage of closing the school or sending the children home in order to break up such conditioned reflexes; and it is noteworthy that in this particular instance, after the vacation of the summer, when there had been time for all such associated stimuli and conditioned reflexes to die out, the children were fresh and healthy once more.

Schoedel's Report on the Chemnitz Epidemic.—Dr. Schoedel, school physician in Chemnitz, has reported an epidemic which manifested itself in a tremor in the handwriting.[84] Beginning with two pupils, in a few weeks there were twenty-one affected by it. The character of the disorder is described as follows:

The tremor affected the children only in their writing. In the first days of the disorder, they began to write well, but after a little while would always have the tremor. In the later days of the trouble the trembling continued throughout the whole of the writing, and finally quite grotesque writing forms were made. The change was shown most strikingly in some of the work in reckoning, the figures showing the characteristic tremor. This ataxia of the arm and hand movements occurred in none of their other work. The children performed their gymnastic exercises and their manual training work without disturbance. Signs of nervousness or of strain or of excitement were not perceptible.

Schoedel treated the children with a strong electrical current, which is an excellent medium for suggestion. The first sixteen children were cured in eight days. With the electric treatment suggestion was given also. In place of the writing hour, for a whole week severe exercise in mental arithmetic was given; and at the beginning of each hour of drill in arithmetic the children were told: "Since you are not able to write, you must unfortunately have mental arithmetic again."

This was an interesting and remarkable occurrence. That children should have a neurosis of this kind, distinct tremor of the hand in their writing and not be affected at all in gymnastic exercises or other activity, is certainly surprising. We explain it as a case of suggestion and imitation; but this does not throw much light on the

phenomenon. It seems probable that two children with neurotic disposition were the ones that first acquired this tremor in the writing exercise with its fine co-ordination of muscles; that then the other children were conditioned by the sight of them, so that every time they began the writing and saw the other children at work, the tremor began. Although we cannot tell what the associated stimulus was, it was obviously connected with the other children and hence the result. The use of electricity inhibited the conditioned reflex, and the cure was accomplished.

In a great part of the cases of this kind probably a conditioned reflex is set up by associated stimuli. It is important to note the origin of such reactions because it suggests the natural remedy. One instance where special attention was given to cure may well be described in detail.

The Epidemics in Basel.—In 1893, in a girls' school in Basel an epidemic of this kind broke out, and this was made the subject of a special study by Aemmer.[1] The chief symptom of the disorder was a hysterical tremor. This attacked especially the weaker and more nervous children. The school was clearly the focus of contagion, and the desire to get rid of school work seems to have been an important factor in causing the disorder.

The presence of psychic contagion was obvious. Aemmer concluded that the epidemic was chiefly due to imitation. The cases were concentrated. The disorder spread from those first attacked into other classes. It decreased during vacation and broke out again after vacation. The attacks were rare or ceased altogether as soon as the children were kept at home. There was often a relapse when they returned to school again. The disorder frequently appeared among children who had

before been healthy when one of the sufferers had an attack in the immediate neighborhood; and when one child had an attack others did also. The trouble continued for a long time.

By what seems to have been a remarkable coincidence a similar epidemic of nervous convulsions broke out in the same school about ten years later, namely, in 1904.* [44] The epidemic continued for four weeks. The cases occurred in fourteen different classes. The age of the pupils who suffered was from eleven to fifteen. The characteristic symptom was a quick vibrating tremor usually in the right hand and in the right forearm. The predisposing causes seemed to be often anæmia, or nervous heredity; but in many cases they were indefinite. The immediate cause in most cases was imitation or autosuggestion, although it was reported to have been fright in a few cases. That the desire to get rid of school work was also a predisposing cause seems to have been clear.

On the 11th of June, the report was first circulated that the tremors had broken out in the girls' school and that they would get six weeks for the summer's vacation. In one building the rumor was that there would be six weeks of the summer's vacation if 300 pupils had the tremors. On the 13th of June it was reported that two pupils in one school had been sent home on account of the disorder. On the following day two further cases occurred, in another schoolhouse also two more. The number increased until altogether there were twenty-seven cases. The age of the pupils was from eleven to fifteen. The largest number were at the age of fourteen.[84]

The school officials, however, had learned wisdom. In-

* For a more complete résumé see *Pedagogical Seminary*, Vol. 17 (1910), pp. 524-533.

stead of sending the afflicted pupils to their homes or closing the school, the announcement was made that school would continue in session as usual, and it was made clear that the contraction of this disorder would not be a means of escaping from the work of the school.

The method of treatment was very interesting. Burckhardt proposed that they should not exclude the afflicted girls from the school, but form them into a special class and have them instructed separately from the other pupils. Accordingly, a small room was taken for the purpose, and a special teacher opened the class on the 17th of June, and this was continued for four weeks.

Special care was taken of these pupils in the special class. The hours were short; the pupils worked from quarter past eight in the morning until half past nine, and then there was a recess for half an hour; then they worked from ten to quarter of twelve, and there was no further work until from quarter past two until quarter of four. The children were given warm milk and bread for a lunch. They had simple gymnastics beginning with free exercises. Ten simple arm and hand movements were employed. The instruction covered all the chief branches of the curriculum. Care was taken that the children should not be overworked. There were few cases of absences, namely, only four out of 444 half days, only one absence for illness.

A great deal of common sense and psychological insight was used in the treatment of these cases. The calmer children were placed in the front seats. The children were not questioned or punished or blamed on account of failure in their lessons.

School work was not much affected, except in some cases the penmanship and arithmetic. The pupils of this special class seemed to enjoy their work. They were re-

ported as being very happy, and they seemed to develop a certain group consciousness and group spirit. They named their class the *Zitterklub Konkordia.*

A Concrete Case.—A single concrete case is described as follows: The patient, E. S., was a girl of thirteen years of age, weak and anæmic. On Friday, the 17th day of June, she came home carrying her right hand, which trembled violently, in her apron. The mother scolded her for acting so like a fool. This had the effect on the quiet timid girl of making the excitement all the greater. The nervous twitchings appeared in the face also when the child attempted to answer, and this tremor in the face continued for about an hour. The mother, who could not understand why the movements could not be repressed, firmly bandaged the child's arm. The tremor did not stop, but pain in the elbow joint ensued.

On the 18th of June, E. S. came to the special class. She trembled so violently that writing was impossible for her. She was unable to answer the easiest questions and could not work with one-place numbers in arithmetic. On Monday, the 20th of June, during a conversation at the ten o'clock recess her arm was unobtrusively massaged by the teacher, whereupon the movements became weaker. On Tuesday, the 21st of June toward evening the tremor ceased. On Wednesday the pupil was calm, and a surprising improvement in mental activity ensued, so that her performance was in no way behind that of her classmates. On the 24th of June, she was dismissed from the class, and no more convulsions occurred.

The Treatment Pedagogical.—The wisdom of the special classes instead of school closure seems to have been clearly demonstrated. The epidemic was soon over. There were only six cases of relapse.

The noteworthy thing in regard to this epidemic was that the treatment was purely a pedagogical one. The checking of the spread of the disorder was brought about by isolating the patients; and the cure of the individual was brought about by general improvement of the health, by talking to the patient, by regular occupation and by distraction of attention. In every case mildness and patience were necessary; great severity was harmful.

This report is instructive, not merely because it indicates how similar epidemics should be treated, but also because it suggests the mode of treatment likely to be helpful for many disorders of a moral or an immoral character that are likely to be spread by psychic contagion in the schools.

In many cases, at least, there seems to be no evidence of inherited neuropathic tendency, nor of acquired hysterical characteristics of marked character. The children, in several of the epidemics, were reported as well and happy. Not the mentally or physically weak children alone, but healthy children, also, were attacked.

Methods of Cure.—The methods of cure found effective, it should be noted, are precisely what would be likely to inhibit and destroy the conditioned reflexes formed. The temporary remedy is to give the shock of a new stimulus, as in the traditional cure by throwing water in the child's face. The permanent remedy is to take the child out of school or close the school, so that in a new environment, free from the associated stimuli, the conditioned reflexes will die out; or, in sufficiently severe cases, where the epidemic persists, and the attacks are so insistent that the attention of the children cannot be diverted to something else, a special class may be formed, frankly recognizing the existence of the disor-

der and giving attention to it with the intention of effecting a cure, thus enlisting the coöperation of the children in the remedy itself—the method used with such notable success in the class described at Basel, Switzerland.

The Effect of Special Stimuli.—If we study this epidemic from the point of view of our definition of suggestion, we see in the first place that there seems to be no evidence of special inherited pathological tendencies; but the epidemic began with the weaker and more nervous children, and in them the determining tendencies included, first, a tendency toward nervous disorder, and second, a tendency to get rid of the difficult tasks of the school. With these tendencies it was not strange that some stimulus connected with the school or the special experience of these children touched off these tendencies. Then, once the epidemic had started, the strong stimulus of the sight of the children first attacked with the tremor seems to have been the special stimulus for the other children that released the tendency to get rid of school work and perhaps certain minor nervous tendencies. Here we have the simple explanation of the beginning and spread of the epidemic.

The cure in this case was brought about by what must usually be the cure for similar troubles, (1) a change of environment by placing these children in a special class, thus reducing the suggestive stimuli; and (2), the special training of these children in tasks that would develop wholesome attitudes and controlling tendencies—in a word, the application of distinctly pedagogical and hygienic measures.

Incipient Neuroses.—Apart from the illustration these epidemics give of suggestion in the schoolroom, the outstanding significant fact seems to be that such

so-called hysterical attacks represent apparently the characteristic features of definite neuroses or of incipient neuroses. For the mental hygienist they are specially important from this point of view. It is unfortunate that they were not studied by some competent psychiatrist.

As Singer and Thom have expressed it, "in essence a neurosis is a way out of some intolerable conflict or difficulty." Typical examples of the neuroses were furnished by many soldiers during the War and after the War. In the face of an intolerable situation the best many of them could do was to take refuge in some neurosis. The experience of many children in school, especially, perhaps, in the schools of the European peoples, is not so different from that of the soldier as many would suppose. To many children in these schools the school situation with its insistent tasks and rigorous discipline presents an intolerable difficulty; and a neurosis of this kind seems to have been, in the cases cited, the way out of their difficulties. As evidence of this it is noteworthy that in a number of these cases the desire to be rid of school work is mentioned as a contributing cause. In the last epidemic at Basel the hope of school closure seemed to have been a powerful motive in initiating the epidemic, whereas the announcement of the authorities that the schools would not be closed, however large the number of patients, together with the method of training in a special class, indicate the advantages of a plan that destroyed any hope of getting rid of school tasks in this way.

The importance of all this for hygiene is obvious. The question naturally arises: How can such unfortunate activities and neuroses be prevented? The answer

in general is to provide the essentials of mental hygiene, especially for each child a suitable task.

Unfortunate Suggestions.—Again the story of these epidemics is instructive in apparently showing in large letters the means employed by many normal children to escape from the difficulties of school work. Wherever an incautious teacher suggests means of reducing the work or of shifting responsibility in the school activities, the teacher provides a stimulus that touches off the universal tendency of most children to avoid difficulty and shift responsibility. In the daily life of the school this is done in a hundred ways. From the point of view of mental hygiene such side-stepping of difficulty means unfortunate training and the development of conditioned reflexes, habits, and attitudes likely to be injurious to the mental health.

It is obvious that suggestion is a tremendously important matter in relation to the whole management and activity of the school. From our present point of view we can put the whole thing very simply. All normal children have an impulse to activity, a determining tendency toward self-assertion, and a tendency to avoid difficulty. All that is necessary is to provide the situation, the stimulus, to release these tendencies. From the point of view of psychology and mental hygiene it seems as easy to have a good school and an orderly school as to have a poor school and disorder.

Suggestion by Environment.—To make a good school we have merely to create a school environment that sets off the impulse to action and the tendency to self-assertion in legitimate activities. More concretely, we can place in the schoolhouse simple toys and apparatus of various kinds for physical exercise, sand, clay, wood and paper, and other material, with simple tools of

various kinds, and in another room implements for drawing, paper cutting, and the like, books and paper, maps, and the necessary tools for different scholastic activities; and then, if we place in these rooms a teacher who can repress his own tendency to self-assertion and act as guide and giver of suggestion to the children, and who has the higher gift of organizing school groups so that the stimulus of the group sets off these determining tendencies in legitimate behavior, we have the essentials for a good school. In such a school, with the doing of suitable tasks, training can be given in the facing of difficulties and the taking of responsibility.

On the other hand, the equipment for a poor school is also easily furnished. To begin with, barren schoolrooms, an ungraded group of children, made up of those of different physiological, mental, scholastic, and social ages, as well as different chronological age; there may be added a teacher who is at once martinet and pedant, and more able to assert himself than to provide opportunity for the legitimate self-assertion and self-activity of his pupils, or, more concretely, a teacher who can make many rules in regard to all details of the school work, of which each one is likely to be a stimulus to touch off the pupil's tendency for self-assertion in breaking the rule.

Again the schoolroom can be furnished with tools and books and apparatus that suggest disorderly and unpedagogical activity, just as an English teacher reports that on the first day of opening his first school he had filled all the inkwells but provided no other suggestion, with the result that before the session was over disorder prevailed, and the inkwells had been emptied, for the most part down the backs of the pupils. Or even with no apparatus whatever and a situation like that in the old rural schools, nothing in the schoolroom

but the wooden desks and benches, naturally the suggestive stimulus was the boy's jackknife, and the determining tendency to activity was touched off by this, with the result that the benches and desks were whittled; or if the pupils had determining tendencies toward art or the like, they were ornamented by words and letters and crude fantastic carvings. Of this self-activity of the pupils in such schools we have the scholastic product in all the old seats and benches that still survive. Or in the presumably better city schools, provide nothing but books, and lessons, and formal conventional scholastic tasks, with a teacher who mechanizes everything, and does most of the work himself, then the tendency to escape the difficulties of the school by some means is likely to be released.

To make the discipline of this poor school accord with its other features, a good plan is to provide a pedant whose attention centers in the scholastic product, or else an inexperienced teacher who can neither set suitable tasks for the children or avoid giving the stimuli to set off their tendencies to self-assertion. More concretely, provide the usual apprentice teacher. Even in a good school the providing of such a substitute even for a day is usually enough to create relative pandemonium.

Epidemics Among Adults.—Of course, similar epidemics from suggestion occur in adults as well as in children. They have occurred in all history, especially, perhaps, in times of war and emotional excitement, and are occurring to-day. A newspaper recently reported a case from Paris in which a man told that he had been pricked with a long hat pin or the like. A number of similar complaints were made, and finally one of the assailants was haled before the court, but no evidence was found. Then the psychologists took up the matter

and explained it. Such epidemics are always liable to occur, and all that is needed is an adequate stimulus to touch off the determining tendencies to such contagion that many people always have. A minor epidemic occurred some years ago in Worcester, Mass.

Some one introduced a new toy that was sold on the street, a feather duster, consisting of a handle perhaps two feet in length with a few feathers at the end. These were used to tickle passers-by on the neck or face, and the peddlers on the street sold them for five cents, with the call "a tickle for a nickel." This little toy started an epidemic of tickling. Apparently respectable people were soon attempting to tickle not only their acquaintances as they passed by on the street, but even strangers as well. The demoralization of the manners of Worcester people in two or three days was astonishing. If Satan had come to the city in person, he could hardly have devised a surer method for perverting the minor morals of the community.

Suggestion as the Teacher's Function

The psychology of suggestion lies at the very heart of modern reform in pedagogy. So much has been said in a commonplace way about the example of teachers, and so little psychological analysis has been made, that we are apt not to see the significance of the truth expressed. What does the teacher really do in the schoolroom anyway? This would be an interesting subject for investigation. Of course, the teacher's function would have to be studied in a two-fold aspect: first, what the teacher does unconsciously and indirectly; and second, what the teacher does consciously and directly.

As I look back upon my own school life and try to recall what my teachers did for me, as far as memory

serves it seems that they did surprisingly little. They kept the pupils in the school quiet or tried to do so, and in this way made the conditions more favorable for study, and they let me come out from my seat two or three times a day to tell them what I had learned. I think of only one teacher who gave me much instruction until I entered college. Doubtless these teachers did a great deal more for me than I remember, but the one thing especially they seem to have done is this: they, in some way, gave the suggestion that learning is a vitally important thing and thus stimulated the pupils to work for themselves. This is perhaps, after all, the best thing the teacher does for the children anyway. The whole work and atmosphere of the school suggests that learning is an important thing, and this, perhaps, is the more emphatically suggested when little is said about it directly. The teacher's example has long been emphasized by educators. The tendency of children to imitate their teachers is well known. That the teacher's bad habits are imitated, as well as good habits, is too well known. The study of the conditioned reflex has thrown much light on the function of suggestion by the teacher. The following case illustrates the way a teacher's mannerisms may come to condition the reactions of the pupil.

A young lady writes: "I once had a teacher who had a habit of twitching her mouth. I never could look at her without unconsciously twitching my mouth in the same way. At last I could not look at her at all during a recitation. Other girls felt just as I did, and some who said nothing were imitating the teacher."

One of Russell's pupils reported that when a child she had a teacher whom she greatly loved, and she tried to imitate the peculiar manner of walking that this teacher had. As the trick was somewhat difficult to acquire, she

practiced walking in the cart ruts because that made her imitate her teacher's gait. Another reports the case of a boy of five who went to school for the first time. "Soon after, his mother noticed that he had a peculiar squint when very much in earnest. She found later that he got the habit from his teacher." Such imitation is very common, and even in less obvious ways the same influence is seen. The nervous teacher is apt to make her class nervous, the teacher who is calm and restful usually has a quiet and orderly class. Second, the teacher is constantly giving suggestion by questions. A question is a suggestion, and the experimental studies of the psychology of testimony have shown that children are more suggestible than adults to questions.

Suggestion in Discipline.—Again in matters of discipline the force of suggestion is apparent, and considerable care must be taken in the formation of rules lest by the indirect method of suggestion a rule may tend to produce the fault condemned rather than to correct it. It is very easy to make a rule in such a way that it at once suggests to pupils the breaking of it. Great care should be taken, too, in fighting bad habits, or else the very means taken to eradicate them may increase them. In a matter like the smoking of cigarettes, for example, the teacher may talk against this habit in such a way as to suggest smoking to pupils who have never tried it in their lives.

We may oppose drinking, secret vice, and the like, among boys in such a way as to suggest the very thing we would hinder. An experienced master in one of the most famous English public schools wrote some years ago of secret vice among boys:

> When I first came to ——, Dr. —— was making a crusade against this failing; boys were sent away wholesale; the school

was summoned and lectured solemnly—and the more the severities the more rampant the disease. I thought to myself that the remedy was creating the malady, and I heard after from an old boy that in those days they used to talk thinks over by the fireside, and think there must be something very choice in a sin that braved so much. Dr. —— went, and under —— we never spoke of such things. Curiosity died down, and the thing itself, I believe, was lessened. . . . When it is combatted from the monkish standpoint the evil itself becomes an epidemic.[14]

Moral instruction is tremendously important, but we may overdo it. The teacher attempts a systematic use of suggestion, but it should be remembered that primarily he is merely one of the social group, and the suggestions given by the teacher may be suggestions either of the similar or of the contrary. From the peculiar position of the teacher as the leader or ruler of the social group, he has a certain advantage; and yet, on the other hand, he is open specially to the danger of giving contrary suggestions. Every teacher knows too well that a prohibition, for example, is likely to suggest to some children an almost irresistible impulse to perform the forbidden act. If a teacher does not appeal to the instinct of imitation, he is likely to appeal to the instinct of opposition, if we may call it such. There is bound to be suggestion in any case.

Suggestion as the Teacher's Function.—Finally, in the whole work of instruction suggestion is the legitimate function of the teacher, and distinctly in harmony with the demands of modern pedagogy. "The great maxim of modern reform in education is the activity of the pupil instead of the didactics of the teacher. There are but two methods of instruction: (1) as regards the pupil, the active and the passive; (2) as regards the teacher, the method of demonstration and the method of sug-

gestion. The active method has been most completely adopted in the kindergarten occupations, in manual training, in the laboratory, and in research at the university. But, with the modifications made necessary by different subjects, it should be adopted generally. The teacher should suggest; the pupils should act." *

The bearing of these studies on the teaching of hygiene should be noticed. In all health education the emphasis should be placed upon training rather than upon instruction, and the importance of avoiding unhygienic suggestion is obvious. For children it may well be said that the study of personal hygiene is itself unhygienic. The investigation of one's own health, like the analysis of one's own wit, is liable to injure it. Both children and adults are liable to injury to health from suggestion. This is, perhaps, particularly so in mental hygiene. The man who is mentally overworked is told that he should not think so much, and this often stimulates his thought. He is told to sleep more, and the very effort to sleep keeps him awake. He is warned, perhaps, that the constant repetition of a certain train of thought leads to madness, and the warning itself tends to make these ideas insistent. Probably most of us know individuals who apparently would recover their mental health if they could escape from the burdens of the simple life and the effort to live hygienically. The school physician and the teacher must always be on their guard lest they develop an unwholesome self-consciousness or some form of hygienic pedantry.

Instruction for the Teacher Not for the Child.—The study of child hygiene and school hygiene is primarily for the teacher rather than for the pupil. Every

* See an article by the writer, in *The Forum*, June, 1898, p. 491.

teacher should study this subject above all others, in order to safeguard the health of the pupils; but the children may well be left in ignorance of it as much as possible. As a matter of fact, we find this astonishing situation in many of our schools. The children are required by law to study hygiene. In some cases, perhaps, this is the only subject the law requires, but the teachers, except in a small percentage of cases, never have had the opportunity to study adequately the part of hygiene they especially need, namely, school hygiene.

What children should receive is not primarily hygienic instruction, but hygienic training. The whole discipline of the school should be so ordered as to develop habits of healthful activity; and though hygienic training is rare, hygienic instruction, for the children at least, is common. It is much easier to show pictures of the drunkard's liver and disordered stomach than it is to give training in the habits of health. Some instruction in hygiene, it is true, the children should have, but this will come better incidentally to training in hygiene.

The result of this grotesque method of instructing the children in hygiene, and leaving the teacher with little opportunity for such instruction has had unfortunate results. Among these have been the inability of the teachers to appreciate the hygienic point of view, to see when their pupils are suffering from physical defects and disorder, or from an unhygienic environment, such as dry, overheated, stagnant, atmosphere; and not infrequently the teachers have intensified unwholesome conditions such as fatigue, excitement, nervousness, and the like, by suggestion. And, further, the result of this has been in some quarters a hostility to hygiene on the part of the teachers. The idea is prevalent among many educators that hygiene has brought about a mollycoddle

attitude toward children which is leaving them without stamina and without efficiency. The late Professor Paulsen of Berlin seems to have held something of this view. He represented the position of those who would call a halt in the teachings of hygiene in regard to overpressure, fatigue, and the like. Such writers, however, merely emphasize what hygiene teaches—that care must always be taken to avoid arousing morbid self-consciousness and the spread of unhealthful attitudes and nervous disorders by suggestion.

Suggestion a Source of Error.—Suggestion must be reckoned with also in all hygienic observations. Many persons feel more comfortable and allege that they have fewer colds when they keep a vase filled with water on the radiators, although the amount of moisture evaporated is so small that it is not likely to increase appreciably the relative humidity. One of the best antidotes for fatigue is suggestion, and in certain investigations it is hard to tell to what extent the results found are due to suggestion. And in all our scientific experiments that have to do with human comfort and health, how much we must discount the results on account of suggestion, we do not know; but they who do not reckon with this factor are liable to a serious source of error. In the whole field of school hygiene, theoretical, experimental, and practical, the psychological point of view is important, and the often neglected factor of suggestion should receive careful consideration by teacher, school nurse, and school physician and investigator.

Suggestion and the Mental Attitudes.—More important than suggestion in school instruction, and even in ordinary matters in regard to health, is the influence of suggestion on the mental attitudes that condition the mental health. The example of parents and teachers

touch off certain determining tendencies in children, and thus the attitudes develop without our being conscious of it, apparently without anyone being to blame. The significance of suggestion here may be shown by a single illustration. A grouch, for example, is a mental attitude. Some children have this, many adults. The children are apt to become disagreeable or neurotic; the grown-ups children look upon as cranks and avoid them. Patri has raised the question what makes children grouchy, and answers rightly by saying it is the example of the grown-ups. "They look for the thing that is not to their taste so they may make a speech about it, and so be as efficient as their grown-up exemplar." Children have a tendency to assume the attitudes of the adult—critical, suspicious, conceited, or whatever it may be. This tendency is quite enough to make the child grouchy if suggestion be given.

Summary

The investigations that have been cited emphasize the following points:

1. In all cases the simple definition of suggestion as any stimulus that touches off a determining tendency is helpful and all that is necessary in mental hygiene.

2. The stimuli may be either external and objective or internal and subjective. In the one case we have suggestion, in the other, autosuggestion.

3. The fundamental problem in training a child is how far should personality, individuality, and the habit of responding to autosuggestion be developed, how far should conventional responses and the habit of responding to heterosuggestion be developed?

4. It is recognized that children are more suggestible

than adults, but what is sometimes called pathological suggestibility, which, according to Sidis, consists in serious and permanent disintegration of the personality, is perhaps more common among adults.

5. The legitimate function of the teacher is suggestion. This is not only of primary significance in teaching and discipline, but also of tremendous importance in the whole hygiene of instruction.

6. Many nervous disorders are spread by psychic contagion.

7. The immediate means of the contagion may be the sight of another child suffering from the disorder, or the suggestion from hearing an account of the disease, or reading about it in the newspapers.

8. The most effective method of cure is suggestion and pedagogical treatment. When there is a single case, the patient should be removed from the school and isolated. When an epidemic occurs, the best method seems to be the establishment of a special class for the children who are afflicted.

9. Crime, suicide, as well as bad habits, fads, and the like, are spread by psychic contagion.

10. The means of suggesting faults may be the example of pupils or teachers, or it may be a description given orally or in the newspapers.

11. The best method of treatment is, on the one hand, negative, the avoidance of occasions that would lead to the bad habit, crime or suicide; on the other hand, positive, the suggestion of healthful activities, the development of wholesome interests and the stimulus of success.

12. It seems necessary that children with more pronounced neuroses like stuttering, chorea, and the like,

should be excluded from the school, or, where conditions make it possible, educated in special classes.

Problems and Questions

1. What are some of the mental attitudes and determining tendencies you have noticed in yourself and in children?
2. Defining suggestion as any stimulus that touches off a determining tendency, give concrete examples of suggestion that you have observed.
3. Report school experiences where fads of coughing, sneezing, wearing one's clothing in a peculiar manner, wearing peculiar colors or the like, have occurred.
4. Report cases where you have used the method of suggestion to get children to do certain things, or cases where you have observed teachers using this method.
5. Report cases where suggestion has had an important influence on the physical or mental health.
6. Defining suggestion as we have, how would you define autosuggestion?
7. Report cases of self-education that you have observed or read about. How was this accomplished?
8. Report cases that you have observed or read about where epidemics of hysteria or the like have occurred in school.
9. Assuming that there is a determining tendency in many children to escape from school work, what methods can you suggest for removing or inhibiting this tendency?
10. Report cases that you know where children, because of suggestion, have neglected their tasks, or overworked in the performance of them, or left school.
11. How far is the teacher's function that of suggestion?

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CHAPTER XII

CONDITIONS OF INHIBITION

UNLESS the reader is a physiologist or psychologist the heading of this chapter may suggest something vague and unreal, or even mystical. It has to do, however, with definite facts and the stern realities of the psychophysic organism. The theories of inhibition are in conflict, but the facts significant for hygiene are well established. We may have regard for the latter without waiting for the battle over the former to end.

Stimulation and inhibition, as we have already seen, are both natural and essential processes in the development and functioning of the nervous system. Thus we have inhibitory nerves like the vagus, that inhibits the heart muscle, and the nerve that inhibits the muscle of the intestine wall, and, in invertebrates, other nerves that inhibit the muscles; and in case of the skeletal muscles of vertebrate animals we have inhibitory as well as excitatory nervous impulses from the controlling nerve centers. In the field of conditioned reflexes and even in the association of ideas we have continued interplay of stimulation and inhibition.

Inhibition the Counterpart of Excitation

Since the term inhibition has often been used vaguely and loosely, it is well again to illustrate the subject from the objective point of view. Following Sherring-

ton [48]*, we may sum up briefly the significant points. The first is the fact of the existence of inhibitory nerves and the inhibitory effect on the muscles of inhibitory summons from the nerve centers.

In 1846, Weber discovered the inhibitory action of the vagus nerve on the heart muscle. Later Pflüger discovered the inhibitory nerve that passes to the muscle of the wall of the intestine. Other inhibitory nerves were discovered in invertebrates, but no such nerves to skeletal muscles in man could be discovered. These inhibitory nerves were efferent nerves from the nerve centers, but, as Sherrington has pointed out, it is not necessary to have such nerves directly to the muscle in the case of skeletal muscles in vertebrates. The muscle contracts only on behest of the motor nerve center.

This trustworthy scientist maintains that inhibition is a positive function, and he draws a significant parallel between stimulation on the one hand and inhibition on the other, in part as follows: Although the processes of excitation and of inhibition are polar opposites, and although one is able to neutralize the other, there are correspondences between reflex inhibition and reflex excitation. Both undergo fatigue. Both outlive their stimulation periods for a short time in proportion to their intensity. The latent period of both is about the same. Many of the time relations of the one resemble those of the other.

That the stimuli of the environment have power to excite this or that form of activity has long been known. That, on the other hand, these stimuli have power to arrest or inhibit such activity has been emphasized only recently. The intimate nature of the reflex inhibitory

* References throughout this chapter are to the bibliography at the end of Chapter XIV on page 447.

process remains obscure, but, as Sherrington has described it, started by nervous excitation, reflex inhibition seems, detail by detail, to present an exact counterpart to nervous excitation. "Often the two processes meet and neutralize each other according to dosage, in appearance as do acidity and alkalinity."

Sherrington continues:[48]

> In all these uses of inhibition we see it as an associate of, and a counterpart or counterpoise to, excitation. Whether we study it in the more primitive nervous reactions which simply interconnect antagonistic muscles, or in the latest acquired reactions of the highly integrated organism, inhibition does not stand alone, but runs always alongside of excitation. In the simple correlation uniting antagonistic muscle-pairs, inhibition of antagonist accompanies excitation of protagonist. In higher integrations, where, for instance, a visual signal comes by training to be associated to salivary flow, the key of the acquiring of the reflex and of its maintenance is attention. And that part of attention which psychologists term negative, the counterpart and constant accompaniment to positive attention, seems as surely a sign of nervous inhibition as is the relaxation of an antagonist muscle, the concomitant of the contraction of the protagonist. In the latter case the coördination concerns but a small part of the mechanism of the individual and is spinal and unconscious. In the former case it deals with practically the whole organism, is cortical and conscious. In all cases inhibition is an integrative element in the consolidation of the animal mechanism to a unity. It and excitation together compose a chord in the harmony of the healthy working of the organism (p. 309).

Thus we may have inhibition of muscles by the nerve centers. A reflex act that contracts one muscle usually relaxes another. A muscle impelled by two reflexes, one stimulating and one inhibiting, sometimes responds with a compromise between the two, but sometimes there is an

alternation of the one reflex and then the other under the influence of the two opposite influences.

Also in the field of sensation inhibition appears. A sensation in one part of the visual field, for example, usually inhibits sensation in another. While two lights of opposite color falling simultaneously on corresponding parts of the retinæ may fuse to an intermediate tint, also they sometimes inhibit each other, and there is a rhythm between one tint and the other.

In a more recent paper Sherrington has mentioned other forms of inhibition, among them the following:[48] If we take the different levels of the nervous mechanism, that of the spinal cord, the mid-brain, and the brain cortex, the higher levels act not only in stimulation but also in inhibition of the lower levels. Thus when one suffers from a cerebral shock, and an arm is paralyzed, not only is the power of voluntary coördination of the finger muscles lost on account of the cerebral lesion, but also, on account of the removal of inhibition by the brain centers, there is involuntary overaction of certain other muscles because the lower centers are deprived of control by the higher centers that have been destroyed. Perhaps it is the same phenomenon that we see in case of some idiots where there is violent and uncoördinated action of the hand and arm, as in Seguin's idiot boy before training was begun, when the boy would strike with his hands in an uncontrolled involuntary manner. Also there is inhibition of sensation when disease destroys the path between the higher and lower levels. Here touch sensation may be impaired, but pain sensation, which is functioned by a lower level than touch, is increased. In general, according to Head, the sensation of touch inhibits that of pain.

Function of the Different Levels

Of the intimate mechanism of all the nervous processes of coördination, facilitation, inhibition, association, and interference, we know little. Even the division of these functions between the different levels of the nervous system and how far they may occur at the lower levels, we know only in part. Recent studies indicate that the lower levels and the nerve fibers and synapses may have a larger rôle than is usually supposed, and the evidence now indicates that perhaps not so many mysterious processes in facilitation and inhibition are the sole function of the nerve centers as is usually supposed. Sherrington, on the basis of the work of Lucas and Adrian, points out that facilitation and inhibition may occur even in the nerve fiber itself, conditioned by the appropriate timing of nervous impulses.[48]

Thus the physiological facts are clear, though we cannot explain them satisfactorily. Our lack of knowledge, however, of the intimate nature of the mechanism of facilitation, inhibition, and association, and of how far these processes may occur at lower levels of the nervous system, does not reduce the importance of these functions for hygiene. In fact, one of the important principles of mental hygiene is recognition of the truth that certain facts may be vitally significant and regard for them imperative in human conduct, and yet we may be ignorant of the mechanism that produces them and unable to analyze it.

Behavior Question of Balance

Thus muscular coördination and an animal's orderly behavior depend upon the right balance between stimulation and inhibition; so in the higher and more com-

plex activity of man, the same is true, and in relation to the performance of his tasks there is always liable to be overreaction or undue inhibition of reaction.

All education, as already suggested, is largely a matter of forming inhibitory associations. Even in sense perception, as Helmholtz long ago pointed out, our senses only sample the world, and the objective possibilities of sensation are vastly greater than what is shown by our receptor organs. Of sensations received, we note some and ignore others. Education in sense perception means the development of habits of inhibition as well as of attention. It is as important to ignore the unessential as to attend to the essential. Practical utility determines what we attend to and indirectly what we ignore. Education in sense perception and apperception consists in developing habits of prevision for what is significant.

Thus, as pointed out by Krasnogorski, and as illustrated concretely by Sherrington,[48] stimulation and inhibition are continually found together. Each is fundamentally important. This is true, not only in neuromuscular activity, but also in the field of acquired activities, in conditioned reflexes, habits, and the like, even, in a certain sense, in the mental processes of attention and association of ideas. In the more formal acquisition of knowledge and skill, which we call formal education, much the same is true. We train to positive activities and also in the inhibition of impulses and tendencies to activity. We teach children first to talk and then not to talk, we teach them to read and then to ignore the unessential in their reading. We teach inhibition as well as positive activity in all forms of motor training. And at the other extreme of education, in the higher education of the scientific student, the process is one of training the student to pick out and

study significant facts and ignore those that are unimportant.

General Conditions of Mental Inhibition

Some day, probably, we shall have a description of the various conditioned reflexes, attitudes and habits, developed in normal children in the various occupations and situations of the schoolroom and the playground, a dictionary, as we may say, of all the usual conditioned reactions for the total number of the various situations in ordinary conventional education—the advantageous, both those that facilitate and those that helpfully inhibit, and the injurious, especially those that inhibit normal activity.

Not only are there a vast number of inhibitory associations but also what may perhaps be called inhibitory attitudes. Among the frequently injurious are a sense of inferiority, or conceit, self-consciousness, conscientiousness, pedantry, sensitiveness, conventionalism, lack of sincerity, or a general attitude of posing, and besides these a great number of more-or-less conscious inhibitions from bad habits, mannerisms, and the like. Some of these will be discussed incidentally.

Inhibitions Developed in the School

We have noted that the school has the opportunity to provide the minimal essentials of mental health as well as of education, a task, a plan, and freedom—not only a task worth while but the stimulus of success. As a matter of fact, in the schools to-day there are many failures. Since the bright children often are those who fail, one may naturally suspect that some deep-seated psychological cause is at work. Why, it may be asked, does a bright child, when he comes to school, often be-

come unable to do the simplest tasks in a straightforward and satisfactory manner? Why does a cloud seem to come over the mental vision of the pupil? Why, in the case of others, is there an arrest of the will so that the pupil is unable to apply himself and unable to control his conduct and unable to succeed? The answers naturally given are that school work does not interest the child, that we do not give proper motives, that teachers do not come into close contact with the children, etc. These answers are all true enough, but can we not come to closer quarters with the conditions at fault, and from a psychological point of view see the psychological causes of the failures that are so frequent?

We can do this in part by studying the law of association. Whenever a task is to be performed, the accompanying associations are significant, either adjuvant or inhibitory.

The school, of course, especially those schools in which the emphasis is placed on training rather than instruction, makes a systematic attempt to develop conditioned reflexes helpful for the tasks of life. The child, however, when he comes to school, is, as already suggested, a bundle of conditioned reflexes, some healthful and some unfortunate if not pathological, due to training in the home. Watson considers this training so vitally significant that he says: "I believe I could make or break a youngster in the first four years of its life; that is, without abusing it, starving it, or otherwise being cruel to it, I could twist, thwart, over- or under-develop its instinctive and emotional life to such a degree that it would never recover from it." Gesell has shown in detail the importance for health of the pre-school period.[28]

Even by the time the child enters school, he is, from a physiological point of view, far from being unsophis-

ticated; and, as regards health, even at this early age he may be handicapped by a large number of unfortunate inhibitions.

Overinhibition.—Formal education is largely made up of inhibitions. Necessarily this is so. The child's social education is chiefly a matter of acquiring inhibitions. To inhibit or delay reaction is a mark of the educated man.

Thus it comes to pass that sometimes repression goes too far, and an abnormal and exaggerated habit of repression is developed. This may be distinctly injurious to a person's character; and probably in not a few cases the most serious handicap to one's efficiency is such a habit of inhibition.

Such inhibitions usually being unconscious, the individual himself may not know what it is that handicaps him; and yet in thousands of cases the boy and girl as they come out of school are less efficient and less able to do things in a clear-cut and thoroughgoing fashion than when they enter school as children.

A Health Examination at School Entrance.—If Watson's conception be correct, then the plan we have advocated of a thoroughgoing mental examination at school entrance is emphasized. With twenty or forty children, each a bundle of more-or-less active conditioned reflexes developed in homes of diverse character, where children are subjected to many different stimuli, how can a teacher be supposed to act intelligently in discipline and instruction without knowing all that can be learned by expert examination in regard to the results of home training? Plenty of time should be taken for such an examination, and especially important in throwing light on the questions involved would be the study of the

spontaneous behavior of the children by a competent expert.[12]

Such thoroughgoing examination of individual children will show that inhibitory conditioned reflexes exist likely to handicap the child not only in school work, but in the development of habits of mental health. We usually call these attitudes habits, fears, peculiarities, and the like.

With the innumerable repressions and exhortations from childhood—not to do this and not to do that, and to avoid certain forms of speech and certain forms of behavior—it is no wonder that by the time manhood is reached, or perhaps long before, a great accumulation of such inhibitory associations has been acquired; and this more than anything else is the handicap of many individuals. Many most brilliant men and women have their activity limited and their efficiency seriously retarded by such conditioned reflexes, and the remarkable results that occur when by proper training or by shock these conditioned reflexes are broken up and these inhibitions removed have been demonstrated in many cases.

The Influence of the Conditioned Reflex.—That children in school are likely to acquire the dependence on such conditioned stimuli is, I think, a matter of almost everyday observation. The conditions may seem trivial and grotesque. Sir Walter Scott reported that when he was a boy, a schoolmate always stood above him in the spelling class until, having noticed that his schoolmate on occasion of a difficult word always fumbled a certain button on his waistcoat, he surreptitiously removed the button, as the story goes, and at the next recitation the boy, lacking the associated stimulus, was unable to spell his word and was displaced by Sir Walter.

The number of things that in case of children and

adults as well may become conditioned stimuli for thinking are innumerable—one's accustomed posture, one's favorite chair, the surroundings of one's study, with many men the inevitable cigar, with some the favorite pen, or even the click of the typewriter, and with others the comforting sensation of the hand in the trousers pocket. Of course, some of these are more than mere conditioned stimuli, but in a very important sense it does not seem straining the point to speak of them as conditioned stimuli of our thinking. That scratching the head furnishes a stimulus to thought has become proverbial; but anything whatever may become a conditioned stimulus. In the good school, however, the work and discipline and surroundings of the school all tend to develop conditioned reflexes favorable for mental work. Thus it comes to pass that children can usually study far better with other children, with the familiar surroundings of the schoolroom, with the presence of the teacher; and even the furniture and adornment of the schoolroom, the posture of the pupils, and the like, all favor the work to be done if the school is rightly organized.

Conditions of Inhibition

On the other hand, with anything whatever in connection with the school, unfortunate and unwholesome conditioned reflexes may be formed. An unfortunate circumstance in discipline or instruction, or an unfortunate method, or a poor textbook, or what not, may arouse conditioned reflexes which mean confusion and repugnance to the given subject. Again, in connection with one or more of the pupils an unfortunate circumstance may develop a conditioned reflex of subacute rage or fear or the like, so that whenever that individual is

seen, this unfortunate and unwholesome reflex has its detrimental effect. Even in connection with objects in the schoolroom, anything whatever, such unfortunate reflexes may be formed.

The source of the many inhibiting stimuli in the school are obvious: at first the group of other children and especially the teacher, then the environment of the schoolroom, the confinement and relative limitation of activity; and at a later period the rules and customs of the school, the customs of the children, the methods of the teacher, and the like. Among the unfortunate inhibiting conditions are the following:

1. *Prejudices, Fears, and Aversions*

The unfortunate aversions of pre-school life combined with dislike or fear of restraint may make the confinement and discipline of the school repugnant. The great psychologist John Locke long ago pointed out the way associated stimuli may cause children to dislike books and study. He wrote:[33]

> Many children, imputing the pain they endured at school to their books they were corrected for, so join those ideas together, that a book becomes their aversion, and they are never reconciled to the study and use of them all their lives after; and thus reading becomes a torment to them, which otherwise possibly they might have made the great pleasure of their lives.

This is but an example of many inhibitions and fears that children develop.

2. *Insanitary Conditions*

Another set of causes for the inhibitions in the schoolroom are the minor insanitary conditions likely to be

present. Such are direct sunlight on the desks, reflected light from glaring walls and surfaces, the shine and glare of unsuitable paper, too fine type on maps and sometimes in textbooks; in this part of the country, unsuitable temperature, sometimes rooms too cold, more often dry and overheated, and distracting noises from the street, the occupations of other children, or the like.

Some people, as already noted, are abnormally sensitive to noise. In certain nervous conditions the thresholds for all stimuli are lowered and naturally noises become most nerve-racking. In a few individuals, however, the cause seems to be largely subjective, perhaps the result of conditioned reflexes formed in early life. A number of distinguished men, notably Carlyle, were of this class, and Charles Lamb, it is said, was disturbed even by music. He writes: "A carpenter's hammer in a warm summer noon will put me more than into midsummer madness, but those unconnected, inset sounds are nothing to the measured malice of music."

The cause of inhibition from distracting noises seems to be less serious in case of children than in adults. Children are apparently less distracted by the presence of other workers and by talk and the like than teachers, but, nevertheless, this is in some cases an important matter because conditioned reflexes and habits in regard to noises are being developed.

The vast difference between the neurotic attitude of Carlyle who was driven wild even by the piano and the musician who went into ecstasy over the creaking of the wheels, grinding of the brakes, and the like, in the elevator of the London tube, is probably not merely a matter of difference in nerves, but in large part subjective, a matter of conditioned reflexes and habits.

Whatever the excellence of one's mental habits may be, children and adults alike should enjoy the luxury of silence part of the time during their hours of rest. Especially meals should be served without the distractions of noise and in places of quiet with pleasing surroundings.

Although children should be protected from the unhygienic noises from the street, from manual occupations, and the like, it is well, on the other hand, to preserve their natural freedom from distraction and by all means to avoid developing inhibiting reflexes in connection with noise. A sound mental hygiene for the ear is, after all, a most important hygienic provision in the activities of the modern world.

3. *Hurry and a Crowded Curriculum*

This is no new cause of inhibition in the schools. For 300 years they have been trying to keep pace with an artificial and crowded curriculum. Comenius in his quaint way described the futile methods of the teachers who in childish fashion gave a little of this and then a little of that, but no opportunity for mental growth.

Perhaps thirty years ago Payne, the London schoolmaster, condemned the tendency in England to crowd the curriculum. "The mill," he said, "grinds badly, the grist is unsatisfactory, and the remedy proposed is to put more corn into the hopper."

Paton quotes Knowlson who declares that haste is the great enemy of modern life. In American education this is largely true, as Paton points out.[40] "Haste to get ready for examinations, haste to pass them, haste to take up one interest, haste to drop it, and haste in getting ready both to live and to die." (p. 233.)

Often in the elementary schools to-day the pressure of

a crowded program is likely to be the cause of inhibitions. Stockton writes of his own observation:[50]

The elementary school is dealing with two or three times the necessary number of subjects. This will be evident to any one who will take fifteen or twenty elementary-school courses of study and make a list of all of the subjects which are outlined in any one of them.

Then he gives what he thinks a sample list of forty-six subjects from geography to ethics.

It is much the same in the higher schools. The pressure of many studies, the exigencies of the program, and the inevitable attitudes of hurry in teachers and pupils alike tend to develop many inhibitory associations. Illustrations could probably be cited from every high school and college. In the modern study of science, especially in the laboratory, a better method has often been adopted; but even in the study of science, the old methods of dictation, crowding and hurry, creep in. The following description of class exercises in chemistry, written by a student as a mere exercise in English composition, has fallen into my hands, and will be recognized as typical of what happens in many classrooms.

The gong strikes, and the class comes to order. Every one has pen ready and notebook open to take notes on the coming lecture in chemistry. The teacher begins by passing around specimens of iron, cobalt and zinc. How fast she talks, and how nervous the class gets in trying to take all the notes. These specimens, too, they are handed out at the very moment when the instructor is dictating the Periodic Law. A whisper arises, "Please repeat the Law, we did not hear the whole of it." Then, there are experiments. One experiment does not work well. "We shall leave that and return to it." On we go to another demonstration, and still another, our pens flying all the while. The bell strikes and the class leaves, wearied

out by trying to grasp all the details of the properties of the three new elements.

4. *Unpedagogical Questioning*

From the days of Socrates to the present the great function of the teacher has been to ask questions. Scott, in an investigation some years ago, found that over 90 per cent of all the questions in the schoolroom were asked by the teacher. It is still true that a large part of the teacher's time is spent in talk. Obviously, if the teacher does not do this wisely, unfortunate inhibitions may be developed. From a hygienic point of view, the statement of the wise man in the Scriptures, "In the multitude of words there lacketh not sin," is likely to be profoundly true.

Several different kinds of questions should be noted:

1. Questions to get the content of the child's learning, his associations, attitudes, and the like.

2. Again, questions to stimulate thinking, to give new associations, and to test one's ability to give a thoughtful answer. The questions by the Socratic method are largely of this kind; and, as Socrates long ago showed, they are an important means of education, and, when rightly used, are an excellent stimulus to the pupils.

3. Another form of question is that to point out error. The Socratic method again has often been used for this purpose, and the questions obviously should be to lead the pupil to detect his own error rather than to demonstrate error to the pupil. Such questions are specially important if used legitimately, but, on the other hand, may be specially dangerous and cause discouragement if employed by a cynical or sarcastic method, or merely to demonstrate the teacher's superior knowledge and the inferiority and blundering of the pupil.

4. Further are questions for the sake of drill. Such questions are often used in mental arithmetic, in the learning of capitals of the states and similar lists of paired associates. They are legitimate in a large part of the school routine, but these, too, if carried too far and made the occasion of too much mechanical routine drill, and if used in a way to dull interest by repetition and prevent opportunity for thinking on the part of the pupil, may have their danger.

All of these have their place, but, as the purpose of each is different, they should be used fittingly and judiciously, and not indiscriminately. A clear idea of the significance of a question and the effect of a question would help greatly. The danger of arousing unfortunate attitudes or injurious inhibitions by unwise questioning is no small evil in the schoolroom. It often comes from well meant as well as from cynical questions.

Teachers have often confused these different classes of questions and the different aims for which they are used; and in the false economy that often prevails, the attempt has usually been made to combine the aim of drill in fitting linguistic expression in answering the question with the aim of reflective thought in giving an appropriate answer. As the scholastic tendency is usually toward the formal, the more emphasis has often been placed on the form of expression. Thus for fifty years, perhaps, the children in our schools have groaned under the rule requiring that all questions should be answered by a complete sentence.

Superintendent Greenwood once reported the following good example of this pedantry combined with logic:

TEACHER: "If I have one thumb on my right hand and one thumb on my left hand, how many thumbs have I on both hands?"

PUPIL: "If I have one thumb on my right hand and one thumb on my left hand, then the number of thumbs that I have on my right hand and on my left hand is equal to the sum of the thumbs on my right hand and on my left hand, therefore I have as many thumbs on both hands as the sum of the thumbs on my right hand and on my left hand, which is two thumbs."

All this is logic, but logic is not for young children.

The Psychology of Questioning.—The contribution of psychology to the art of questioning has been significant. Among the special points are the following:

1. The question is really an association experiment under school conditions, just as an association experiment in the laboratory is a question under controlled conditions.

2. The association reaction time of children is very much longer than that of adults; in the case of the latter it is from one to two seconds, whereas in the case of a child it may be four, five, or six seconds. Meumann sometimes found it as long as ten or twelve seconds. Hence the folly of requiring quick answers.

3. Meumann found that, when children were required to give quick answers, the answer, so far as reflective thinking was concerned, was likely to be a useless answer.[84]

4. A child's spontaneous answers usually give the concrete and particular rather than the abstract; and those children who reply in abstract terms were found in experiments by Meumann to be children who were somewhat inferior, not the brighter children. Whether this would be verified by adequate experimentation is uncertain.

5. Children, in a spontaneous report, give more accurate testimony about a situation or an object than

when they are questioned and have to give direct answers in the form of an interview.

6. Great delay in association reaction time, or delay in answer to an ordinary question where the answer is well known, indicates confusion, interference of association, or an emotional interference, either from the distractions in the child's surroundings or from personal inhibitions.

Thus careless questioning is a good way to cause inhibitions, especially in a school group where a child may be timid before the teacher or on account of the group of other children, and especially if the question is put in an unfortunate manner or with confusing suggestions. A task where the children ask questions naturally in regard to what they are doing is far better. Written questions carelessly framed are liable to be no less dangerous than oral questions.

Naturally enough, in the schoolroom attention has largely been focused on the form in which answers are given; and the different aims of questioning; and the different methods of questioning suited to the different aims, have largely been confused, seldom, perhaps, seen in right perspective.

Yamada's Study of Questioning.—Important studies of questioning and the testimony of children and adults have been made. A valuable bibliography of this literature with the report of investigations of his own are given by Yamada, who made a careful study of this subject a few years ago.[58]

The studies of questioning and of testimony have largely centered around two forms of giving testimony: first is the *Bericht,* that is, a spontaneous report in regard to a topic, as when Yamada requested his pupils to tell what they knew about the surface of South

America; and second, the *Verhör,* which consists in questioning the witness, as in the law courts or in the ordinary questioning in the classroom. The significant facts are largely given by Yamada. Each method has its advantages, but so far as accuracy is concerned fewer errors are made with the *Bericht* than with the *Verhör.*

Yamada gives illustration of the way teachers by their questions, their attitude, their visual expression, tone of voice, and the like, give inhibiting suggestions to their students. The same is largely true of the examining attorney and the witness in the courtroom.

The influence of questioning in the law courts has apparently been considerable in American schools, or else the method of the schools has passed over to the courts. Many teachers seem to have taken their method of questioning from that used on the witness stand, and the result has been, as it so often is in the courtroom, confusion and inhibition.

Likewise the tone of voice and gestures by the teacher often cause an inhibition. The following examples of this method of inhibition are cited by Yamada. He notes that though we generally infer that pupils do not answer because they do not know, this inference is often incorrect. For example, a number say in substance:

"I knew very well the answer, but the teacher's tone of questioning suggested to me that she does not care much about the answer. So I felt that my answer was not important and consequently I did not answer."

Again to quote from his paper:[58]

> Two girls of the seventh grade say: 'If a teacher shows that it is fun for her to ask a question, we become stubborn and simply refuse to answer."
>
> Still another girl says: "If her tone indicates that she is cross, I don't feel free to talk during her lesson or to answer

her questions; it also discourages me and makes me not to enjoy the subject. As a result I often remain silent waiting impatiently for the period to end."

"Our teacher's voice was so sharp and cross that whenever she called my name I became very nervous and could not answer her questions even when I knew them well" (p. 159).

One apparently trivial but really serious method of inhibition is that of interrupting the pupil while an answer is being given. This is likely to be peculiarly unfortunate, and even the method of requiring a complete answer to every question is apt to distract attention from the thinking pertinent to the subject and to focus it upon the form of expression with the result of interference of association and inhibition.

Thus questioning, which plays so large a rôle in the schoolroom, may give most helpful discipline and be a distinct aid to clear and coördinated thinking by the pupil; or, on the other hand, if sound psychological principles are ignored, it may prove an occasion for the development of serious inhibitions.

5. *Examinations*

One of the best examples of the inhibiting attitudes developed in the ordinary school is perhaps the usual artificial attitude of the pupil toward examination. When the modern examination system was introduced into the public schools, some fifty years ago or more, it appeared to be such an admirable piece of academic machinery that it was soon extended to the lower grades of the primary school. Then, under the stimulus of rivalry, the exhortation of teachers, and the desire for high rank by ambitious pupils and fond parents, marks soon became a fetish, and the fear of failure at examination soon developed.

The grotesque and absurd nonsense in the answers to examination papers that results from the inhibitions of the examination attitude is familiar to the general public as well as to teachers. Few, perhaps, realize, however, how permanent these inhibitions are, and how they persist and appear even in the examination papers of college and university students and of candidates for the teaching profession. Even at an examination of a mature student for the Ph.D. degree, serious inhibitions may develop. Old inhibitions become active, obscure questioning may cause new ones. The candidate's mind may be set for a difficult question when the question asked is an easy one. With this condition the question: "How long did the Thirty Years' War last?" may puzzle a bright student. Yamada says that in his own case a question at an examination or the like "causes a sudden arrest of psychic activity, or there arises out of an unconscious complex an apparently unrelated idea." [58]

Most students seem to have an artificial attitude as soon as they sit down to an examination with a list of questions to be answered. An experiment tried some years ago with a group of university students indicated that they, too, drop back into the attitude of school pupils when given tests under approximately schoolroom conditions. Even mature men and women in such a situation are apt to attack an unusual question as containing some trick or catch in it. Especially is this true if the examination is made somewhat unconventional in its questions, to test one's mental capacity and one's ability to think independently. Instead of using their ordinary common sense, the students are apt to give most foolish and sometimes imbecile answers. The attitude often seems to inhibit one's ordinary ability to

reason. Every teacher perhaps could give illustrations. A test made by the writer is suggestive.

The Examination Attitude.—A group of graduate students in education was given a test which corresponded in external conditions pretty closely to an ordinary examination, although the paper was labeled "A fake examination in unconventional thinking," a somewhat unfortunate title, since it suggested to many of the examinees that some trick or catch was likely to be involved in the questions. The examinees were largely good students, and have become successful teachers. The problems presented were diverse in character, but all of them rather unusual. One, for example, was the following:

> Some hygienists maintain that a schoolroom with northern exposure gives the most favorable illumination for school occupations. Problem: Arrange and locate an ordinary schoolhouse with four sides and a room on each side, in such a way that each room will have a northern exposure.

This problem, although unusual, can hardly be considered especially difficult, except for the fact that most students probably were handicapped by a provincial geographical knowledge and conventional practical considerations. All sorts of architectural devices and monstrosities appeared in the answers, only one or two suggesting the correct answer, namely, that it should be located at the South Pole. Most of them apparently had become too conventional in their thinking, at least in an examination, for anything like this to occur to them.

Inhibition with a Simple Question.—For a single illustration of the attitudes of the examinees and the diversity of answers given, another question may be taken.

This was perhaps the simplest question on the paper and suggestive of the popular parlor conundrums in arithmetic, common enough in the entertainment of children, in fact, distinctly a child's question, reading as follows: "If 300 cats catch 300 mice in 300 hours, how long will it take one cat to catch one mouse?"

Only a few, perhaps half a dozen of the students, gave the correct answer, namely, 300 hours.

The most noteworthy thing was the fact that so many erroneous answers were given. Nothing but the strength of the examination attitude would seem to account for this. For the time being many of the students had dropped back into their school days and were precisely in the attitude they might have had at an examination in the grade school or the high school, except that this was masked by a semiscientific attitude.

To an extremely simple problem they brought the mental set for a very difficult problem, and the result was disastrous. It is significant to note here also that the element of familiarity or unfamiliarity in the form of the question is a great factor in determining the degree of clearness or confusion in the mind of the examinee. State the question in a slightly more familiar form, putting it in this way, for example: "If 300 policemen, in 300 days rescue 300 cats, how often does one policeman rescue a cat?" then the ordinary individual has no difficulty with it. It was the attitude toward a difficult task, the unfamiliarity of the form of it and the semiscientific skeptical, critical examination attitude that was the undoing of the students. Each one looked for some little catch, some unconventional trick in the wording of the problem or the like; and for the most part the heroic effort to be strictly scientific

produced in many cases a pathetic result. The following are some of the answers:

This looks like one of those questions which I had a hatred for as a small boy when I had to take mental arithmetic in the public school. I have a strong prejudice against the kind. I don't know whether I want to attack it or not.

I thought automatically it would take one cat one hour; then the absurdity of the problem was recognized in terms of visual imagery—(a cat seen pouncing instantaneously) with accompanying kinæsthetic *Einfühlung*. Problem is stated so that it would be impossible to determine temporal rate for any one mouse.

It *may* take one cat exactly one hour to catch one mouse. Three hundred cats may catch his mouse (300 mice) in the same hour, or they may consume 300 hours if they catch the mice successively, and any number of hours less than 300, etc.

Time depends on the skill of the cat.

It will take one cat just long enough to get his paw on the mouse.

1/300 of 1 hour—.2 minute.

Depends strictly on conditions. (1) If, as the question implies from the coincidence of numbers, each cat was pursuing its own prey, the rate would be a cat a mouse an hour. If (2), on the other hand, they were coöperating in a strictly regular fashion, it would take 90,000 hours. I incline strongly to the first view.

Reason Balks at the Unfamiliar.—Most of the problems presented at this test were more difficult and some of them apparently quite beyond the ability of most of the examinees, but the attitudes and the inhibitions of the ordinary examination occurred, apparently, in the case of nearly all of the students.

In general, the answers showed not only the inhibitions of the ordinary examination, but the inability of the ordinary student to use his reason in regard to a

problem dealing with unfamiliar things or stated in unfamiliar terms; further, they showed the inability to think outside the narrow limits of conventional experience, and again the inhibition that comes from maladjustment of the mental attitude to the problem in hand. Sometimes the answers revealed the inhibition from a set of the mind for a difficult problem when the actual one is simple; or again, a set of the mind for an easy problem, when the actual problem is difficult; and, in either case, the inability to judge of the real significance of the conditions presented, and the artificial cleverness of some advanced students who seem to be always on the lookout for a trick or catch or something which is open to criticism. The ordinary teacher will find similar illustrations from the usual examination experience perhaps, in any case the inhibitions that are likely to be developed.

It appears from these answers that for the time being many university students may become distinctly pseudo-feeble-minded, with reason inhibited by the spell of examination. The necessity of putting up a bluff and saying something, combined with the attempt to be distinctly scientific and note in a critical manner the different conditions involved in the problem, led to the answers given. For the time being the mental blind spot, as Oliver Wendell Holmes has called it, was functioning and any answer was possible.

Thus, in general, the extreme critical attitude, and sometimes the attempt to be scientific, inhibit common sense; and a complex and obscure, or even an absurd, attempt at explanation, instead of a simple, straightforward one, is the result.

An English Examination.—After this test of university students in psychology, the writer is ready to

believe the grotesque example of the inhibiting effect of the examination attitude given not long ago by an English writer who describes an examination of adults given for testing general intelligence.[59]

In an examination paper on general knowledge the following was one of the questions: "What material would you suggest as most suitable for the floor of an office, the roof of a house, the inside of a bath, the top of a kitchen table, a garden path. Give reasons for suggestions."

Two candidates, one a man and one a woman, read the questions as if there were a mark of interrogation after the word "office," and supposed that the roof, the inside of the bath, the top of the table, and the garden path were suggested as so many alternatives for the flooring of the office; and both these candidates answered that the top of the table would be best, the woman giving sound reasons why the roof, the inside of the bath, and the garden path, would not be suitable material.

The writer suggests that the reason for this absurd mistake is to be found in the ordinary view taken of examination papers by those that answer them.

> They are expected to be tricky rather than sensible; and so, when one seems ridiculous, the candidate does not suppose that he has misunderstood it. He takes it for granted that he is not in the world of realities at all; an examiner is just the sort of person who would ask whether you would rather pave an office with the top of a kitchen table, the inside of a bath, the roof of a house, or a garden path; and he would ask it because his business is to ask silly questions.

Apparently, the ordinary examinee is liable to lose his head on occasion of anything unexpected or unconventional; and perhaps the chief value of such ques-

tions is to show the degree of disintegration to which the examinee is subject in such a situation.

If we turn aside for a moment to give practical suggestions, it is obvious that the unfortunate attitudes mentioned should be eliminated as much as possible from school examinations. Here are presented certain important problems which well deserve study. Without attempting a solution much could be done toward avoiding the unfortunate attitudes by certain simple devices, for example, one that Robinson has used, of letting children themselves form the questions for the examination.

The Inhibition of Failure.—In general, the exaggerated idea of the relative importance of examination combined with the hurry and dread of such formal tests, together with the dread of low marks as the badge of failure, produce many inhibitions. The opinion of a school boy, cited by Book, is a pertinent illustration.[7]

> A boy of 17 writes: "Low marks is the greatest cause of boys leaving school. When a boy gets low marks he begins to get lazy and discouraged and does not try to make up his lost work." According to the pupils nothing is so discouraging as to get low grades or poor marks when doing one's best. A boy writes: "I know by personal experience that there is no greater discouragement in school life than to know that you are behind the majority of the members of your class. The temptation to drop out is a hard one to resist." Another boy said: "If he does fail, his first thought is, 'I am going to quit.' The failure causes him to detest his books." "Boys and girls usually leave high school," said a third, "after they have failed in some study. They become disheartened and think they owe the school or some teacher a grudge, so leave."

Teachers as Causes of Inhibition

It may be humiliating to our professional pride, but it is necessary to face the facts; if we do, it must be

recognized that many unfortunate inhibiting conditioned reflexes and associations are likely to be formed in connection with the teachers themselves; sometimes, on account of grievous fault on the part of a teacher, more often, perhaps, on account of unfortunate circumstances outside the school, and quite innocently as far as the teacher is concerned. This may happen because the teacher resembles some individual who has aroused aversion in the child or suggests one of the child's parents who has aroused unfortunate conditioned reflexes.

Meumann illustrates the dangerous rôle which inhibition may play in the mental life of children by the following concrete example: [84]

A child that he knew entered a new school. His former teacher, who had an antipathy towards the thirteen-year-old boy, introduced him to the new teacher in a tactless manner and blamed the pupil. From this moment the boy, who had been distinguished up to this time, could do nothing more. Not only did his intellectual performance decline from day to day, but his attention and behavior became bad, his affective life became shy and depressed; at the end of the year he was not promoted; in a word, the boy would have gone to pieces if his parents had not taken him away from the school. In the new school the teacher treated him trustfully, and from this moment on the boy was transformed in all his activity; became obedient, had excellent marks, and left the school as one of the best pupils.

Meumann gives this case as typical in that a single definite inhibition of the will suddenly entered into the boy's whole life, discouraged his self-confidence, depressed his spirit, and decreased all his performances, both intellectual and moral. If such a child does not

have a change of environment, or if he does not have the strength of himself to rise above the checking influence, he is ruined for his whole life. Meumann says he has observed this repeatedly, and Herr Kankeleit, a teacher in Königsberg, reports that such cases are common in school practice.

This boy mentioned by Meumann, whose will was inhibited by the injustice of an unwise teacher and therefore unable to do anything, is apparently a case of unfortunate conditioned reflexes. The sight of his unjust teacher, or the sound of his teacher's voice, always aroused conditioned reflexes or associations that inhibited the normal mental activity of the pupil. We do not need to evoke any transcendental power of the will or the like; it is even more natural to consider that the unfortunate result came from such unwholesome conditioned reflexes and the fact that the child's will was not strong enough to overcome them. And good evidence that this is the correct interpretation is furnished by the fact that removal of the boy to another school at once restored his ability to do good work.

The Teacher as a Stimulus

Watson has pointed out the other side of all this and called attention to the fact that the conditioned reflexes connected with the emotions of rage or fear or love may act distinctly as a help and a stimulus to the individual enabling him to do more and better work. Undoubtedly in case of the emotion of love this is often the fact, and it may be true in case of the other emotions. Watson says:[55]

As we look back upon our school life we are convinced that those teachers, both men and women, for whom we have had strong attachments have been the ones from whom we have

received lasting benefits. Nor is the case very different with the other two emotions. A teacher who has on occasion a sharp and caustic tongue can by the use of it induce a modified rage response in his pupils which may be extremely useful in raising the level of achievement of the class. Likewise the teacher who can, and at times does, induce the fear reactions becomes a powerful factor in the lives of the pupils.

Watson is probably quite right in regard to the influence of many teachers. More commonly, however, it may be feared that the teacher with his sharp words furnishes a conditioned stimulus that inhibits the pupil's activity whenever work is attempted. Meumann is probably right also in referring to the teacher as one of the factors in causing chronic and general inhibition. He says in substance:

"As a rule it begins in case of the performance of a child in a definite subject, for example, in arithmetic, perhaps. A child begins to be neglectful on account of false treatment by parents or the teacher or as a result of failure or by the influence of fellow students. His performance first degenerates only in this one subject, but a changed relation between him and the teacher now occurs; both lose their mutual trust, and the child in himself. Soon all his work degenerates. Lack of self-confidence, lack of trust in the teacher and lack of confidence in the child on the part of the teacher set up a vicious circle and the child goes to pieces, or is seriously injured for life."

Convention and Inhibitions

Again, school education consists largely in training into habits of doing and thinking the conventional. This is important both for education and for the mental

health. Thus we soon become slaves of convention and can think even only in narrow limits and inhibit all other thinking. The repression of disagreeable thoughts and the like, illustrated so profusely by the Freudians, merely indicates in large letters what all of us do in a large part of our mental activity. Whatever is not agreeable, whatever does not harmonize with our emotional and habitual mental set or attitude, we are likely to inhibit.

How largely the life of the ordinary individual is limited by convention by the time the education of the school is completed, is likely to be unsuspected by the person himself and by his teachers and companions. It is only when we meet some person of strong personality who has developed individuality in spite of convention or some one whose education has been distinctly unconventional that we get an illustration. The poet Joaquin Miller apparently furnishes a striking example. Of his own early education, he says:[36]

I had never been a boy, that is, an orthodox, old-fashioned boy, for I never played in my life. Games of ball, marbles, and the like are to me still mysterious as the rites in a Pagan temple. I then knew nothing at all of men. Cattle and horses I understand thoroughly. But somehow I could not understand or get on with my fellow man. He seemed to always want to cheat me—to get my labour for nothing. I could appreciate and enter into the heart of an Indian. Perhaps it was because he was natural; a child of nature; nearer to God than the white man. I think what I most needed in order to understand, get on and not be misunderstood, was a long time at school, where my rough points could be ground down. The schoolmaster should have taken me between his thumb and finger and rubbed me about till I was as smooth and as round as the others. Then I should have been put out in the society of other smooth pebbles, and rubbed and ground against them till I got as smooth and pointless as they. You must not have

points or anything about you singular or noticeable if you would get on. You must be a pebble, a smooth, quiet pebble. Be a big pebble if you can, a small pebble if you must. But be a pebble just like the rest, cold, and hard, and sleek, and smooth, and you are all right. But I was as rough as the lava rocks I roamed over, as broken as the mountains I inhabited; neither a man nor a boy.

How much the poet would have lost and how much he would have gained by a conventional education, we do not know. Although convention is an economic device of great importance, on the other hand, breach of convention to some individuals is as serious a matter as a breach of a moral law, or at least it arouses as much feeling, and may be as constant a source of worry as the fear of having done wrong is to the individual with a morbid conscience. In any case, conventional training means permanent inhibitions.

Such are some of the general conditions of inhibition. Those more distinctly emotional in character are considered later, although all of them are colored by feeling.

Indirect Causes of Inhibition

The vast number of inhibitions by which children in the schools are liable to be handicapped may seem surprising to most people. Not merely are all the inhibiting conditions already mentioned likely to have their effect, but others more remote from the work of the schoolroom; not merely the conditions of the home and the street, but even the wider conditions of economic, industrial, and political life in the nation may exert their inhibiting influence. What seems to be a striking illustration of this has been reported by the English investigator, Burt:[14]

Above all, tests in arithmetic have proved extremely sensitive to disturbances of social conditions. There is, indeed, no subject of instruction but has been unsettled by the War; but arithmetic, in virtue of its exacting call upon the most delicate functions of the mind, has been dislocated more than any. It was the Belgium of the school curriculum. It suffered first; it suffered most; it suffered more conspicuously than all. The havoc of fatigue, of insufficient sleep, of excitement, shock, and strain, of change in teachers and in the sex of teachers, was, as a rule, seen earliest in arithmetic. At one period, indeed, the whole grading of my problems had to be materially reduced, and the general requirements of my norms to be repeatedly relaxed.

Overinhibition.—Since for thousands of years the custom of developing certain forms of inhibition has been the work of the home and the schools, and a large number of conventional inhibitions have resulted, it is not strange that there is a tendency in the schools to overdo the matter and undue repression and inhibition are often the result. Plato puts into the mouth of Protagoras in the *Dialogue* by that name, a remarkable description of this method of education as practiced in ancient Greece and as it largely prevails to-day. The famous passage runs in part as follows:[31]

Education and admonition commence in the first years of childhood, and last to the very end of life. Mother and nurse and father and tutor are quarreling about the improvement of the child as soon as ever he is able to understand them: he cannot say or do anything without their setting forth to him that this is just and that is unjust; this is honourable, and that is dishonourable; this is holy, that is unholy; do this and abstain from that.

This scholastic inhibition, repression, continued interference and exhortation, has become in many schools

a serious handicap to education and the mental health of the children. It appears in all the methods of discipline and the various forms of instruction and training. Mental hygienists and psychiatrists see the serious significance of it, because they have seen the disastrous results of repression and the unfortunate character of the overinhibited type; school teachers, absorbed in methods of instruction and the scholastic product, naturally are often blind and quite unaware of its influence. As Breese, Roback, and others have pointed out, the school is a place for positive instruction, the spontaneous doing of tasks, and not a place for repression and inhibition. It can hardly be expected, however, that teachers will at once give up this age-long tendency and realize the danger of overinhibition; but the facts mentioned emphasize anew the need for adequate training in mental hygiene in the schools for teachers.

As education and formal training are necessary to give an individual the benefit of the wisdom of the past and to fit one for the practical situations of life, and since the power of inhibition is the mark of the educated man, almost inevitably this training is carried so far that injurious inhibitions and repressions are developed; and so it comes to pass that in many cases the most important thing is for the teacher to discover and remove the child's inhibitions, and for an adult to remove the accumulated inhibitions of a lifetime. Thus the great biologist Bateson goes so far as to suggest that the difference between the ordinary man and the man of genius is not so much that the former has abilities that the latter lacks, but rather that by some divine release the man of genius is freed from the inhibitions by which the ordinary man is handicapped.[5]

Problems and Questions

1. Give other examples from physiology of neuromuscular and neural inhibition.
2. Give additional examples of inhibition from your knowledge of psychology.
3. Consult the excellent account of inhibition given by James in his *Talks to Teachers.*
4. Report examples of neural or mental inhibition that you have observed in yourself or in others.
5. Have you observed unfortunate inhibitions in physical exercise and sport?
6. Report cases of injurious inhibitions that children have brought from the home or the street.
7. Can you recall injurious inhibitions in your own case that have survived from childhood?
8. Report cases of inhibitions developed in the school that you have observed.
9. Have you observed unhygienic or other conditions in the schoolroom that have become the cause of inhibitions?
10. Describe other special causes of inhibition besides those mentioned in the text.
11. Describe some of the more definitely helpful inhibitions developed by the school
12. Make a brief summary of the most important points presented in this chapter.

CHAPTER XIII

INHIBITION OF THE INHIBITIONS

An old story, familiar to every psychologist, runs in substance as follows: As the result of many wars the king of a great ancient people found his treasury exhausted. He summoned a famous magician and commissioned him to find a method for transmuting baser metals into gold. The magician shut himself up from the world, and his study was rewarded with wonderful success. He devised for his purpose a formula of mystic words. By repeating this with complete concentration of attention he could change any metal to gold. The magician, however, was a wise man, an economist, and a good psychologist as well as an expert magician. He reflected that to turn other metals into gold would do the king no good, but harm, not only because with an enormous increase in gold, it would have little value, but because the iron and copper needed by the smiths would be used up. As a psychologist, he reflected also that if he made emphatic the condition that the formula must be repeated with complete concentration of attention, the extreme effort to attend would serve as a distraction and defeat its own end. So he made this condition emphatic and concrete, and reported the formula to the king as a sure means of making gold, provided in repeating the mystic words one did not think of a hippopotamus. The formula was correct, but no one ever

succeeded in making gold by means of it because no one was able to fulfil the necessary condition.

This fable is instructive both for hygiene and psychology, for it suggests the imperative character of our associations. This prohibition formed an association foreign and inhibitory. Once formed, it was permanent and imperative. Give the formula without mentioning the prohibition and anyone could use it with concentrated attention to win the wealth of the world. Mention it, and no one could use it with complete attention, for the distracting association would be imperative.

The fable suggests also the two kinds of association: first, helpful or adjuvant; second, inhibitory. Hygiene is concerned with both, with the adjuvant quite as much as with the inhibitory; for modern hygiene is positive, emphasizing the need of healthful habits of association as well as the danger of unwholesome and disorderly habits of association. Just as the physical processes of stimulation and inhibition go together, as Sherrington has shown, so in the mental processes they accompany each other; and though normal processes of inhibition are necessary, many injurious inhibitions are developed.

Conditions of Inhibiting Inhibitions

Such inhibitions, as we have seen, are caused by the imperative law of association, but the very same law provides the remedy. Just as the associated idea inhibits the original idea, so a new association can be formed that will inhibit the inhibition. To-day the psychologist might be able to make gold by the philosopher's formula; and to do it he would train himself every time he repeated the formula to think of gold in some form—gold coin, gold rings, gold crosses, or the like. or perhaps to think of the Madonna, or some great work

of art, or some great ideal or absorbing theme. Thus by training, little by little, the individual would finally have all his associations connected with the formula and with gold, or the Madonna, or work of art, so that there would be no room for the thought of the hippopotamus to come in. In other words the psychologist would attach rival stimuli to the formula that would absorb the whole attention.

Although, as we have seen, children, as well as animals, are liable to be the victims of any stimulus that by chance occurs in their environment; and coördinated activity, even in the higher processes of memory and thought, is likely to be inhibited; and although the law of association is imperative, and such inhibitions cannot be overcome directly; on the other hand, nature has provided many forms of protection, and any inhibition may itself be inhibited by proper associated stimuli. We have also noted some of the many inhibiting conditions in the school. Of the conditions that inhibit the ordinary inhibitions, the following are perhaps the most important:

1. *Fatigue*

Fatigue, itself a form of inhibition, in turn removes many unfortunate conditions and inhibiting associations. The whole mechanism of fatigue is protective. For example, the more central and more important parts of the nervous mechanism are protected by the fatigue of the more peripheral parts.

To illustrate this somewhat more concretely, although the exact working of the system we do not know, in neuromuscular activity the end plate fatigues relatively easily. As Stiles has suggested, it is something like a fuse that burns out and protects the more important

part of the mechanism. Thus the end plate fatigues, and the muscle can no longer contract, and the nerve center is protected. Again, the synapse, the point of connection between neurones, seems to fatigue easily; and, though it seems often possible for another path to be utilized, still this has temporarily its protective function. In spite of lack of knowledge how far toxic products, how far fatigue of the synapses, and how far other factors are involved in the phenomena of fatigue, the general fact of protection of the organism by fatigue, and protection of the more central and the higher levels of the nervous system by the relatively greater fatigueability of the more peripheral parts, seems to be established by investigations already made.

Fatigue of the Retina.—Again, when the glaring rays of the morning sun strike upon the retina of the eye, the stimulation is so violent that function is inhibited, but the nerves of the retina become fatigued by the sunlight until in a few seconds the retina reaches such a condition of fatigue that vision in the light is possible. In other words, the intense stimulus of daylight, which inhibited the function of vision, is itself inhibited by fatigue, and the condition of thorough fatigue of the retina suitable for vision in the light ensues. With the protection of this inhibition, the human eye functions in the light with practically as much comfort as in the dark, and it is only in a condition of irregular illumination, as where there are spots of intense light, as from the headlight of a locomotive, or the lights of an automobile, in the midst of general darkness, that serious discomfort comes, because such a condition makes necessary an attempt at vision in the light when the retina lacks the protection of fatigue.

Fatigue as a Protection from Fear.—Thus to a large degree animals and children may be protected from the evil effects of fear by fatigue. Stimuli, however violent, lose their effect by continued repetition. Children, in their plays, become habituated to loud noises and violent stimuli of many kinds and thus become protected from fear of them. So children might probably be trained, habituated to violent change of stimuli in many ways in their work and especially their play. This should be done, of course, with common sense, just as one must train one's colt or one's dog with caution.

Again, in all emotional states, a protection by the fatigue occurs. Every condition of emotion, every intense emotional pleasure, every condition of excitement, even every condition of interest as an affective state, is dulled by repetition. The law of the diminishing intensity of interest is as universal as the law of muscular or nervous fatigue from continued function. Thus the more intense emotional states in intense grief, and even under ordinary conditions in intense fear, are deadened and made endurable by the fatigue from repetition.

2. *Sleep*

Sleep is a mechanism of prime importance for the prevention and the removal of injurious inhibitions. There seems good reason to accept Claparéde's theory and to regard sleep as a protective reaction of reflex character.[13] * If we do this, the protective function of sleep under different conditions is clearly seen. Just as a sudden flash of light is the stimulus, and the reflex wink the protective response, so the feeling of fatigue is the stimulus, the reaction of dropping asleep, the

* References throughout this chapter are to the bibliography at the end of Chapter XIV on page 447.

response; or an accumulation of toxic products in the blood may be the stimulus and the reaction of dropping asleep, the response. Or, again, any one of a number of varied physical conditions, cerebral anemia, an excess of CO_2, or other biochemical conditions; or, on the other hand, the pleasant sensation of a comfortable posture, the sight of a couch or the usual place for sleeping, or any one of a number of habitual conditions, may give the stimuli and the reaction of falling asleep be the response. This instinctive reaction is not because one is exhausted, but to prevent one from becoming exhausted. It is distinctly a protective mechanism.

Not merely is sleep a protection for the body, but it is also a protection for the mind, and one of the best means of removing unfortunate inhibiting attitudes and associations. This has always been recognized, and poetry and folk thought have always acclaimed the blessings of sleep. As one writer has expressed it, "Thank God for darkness and night and sleep, when blessings hover around and steal in, water into wells, and peace and joy and comfort into the minds of men." If we agree with Pavlov that sleep is a condition of general inhibition, then we have local and special inhibitions merged in this and in turn removed with it.

3. *Emotional Reactions*

Observation and folk lore have given thousand-fold testimony to the removal of inhibitions by fundamental emotional reactions. Thus love inhibits fear, anger also inhibits fear; and in some individuals religious emotions are so strong that they inhibit fear. As everybody knows, a greater fear inhibits the lesser one, and in conditions of great stress and utter despair fear itself is likely to be inhibited.

Concrete illustration is unnecessary. It is a matter of everyday observation, and innumerable examples have been given by psychologists. Thus emotion, the cause of so many injurious inhibitions, may in other conditions become the stimulus needed to remove inhibitions.

4. *Shock*

The extreme form of stimulation and inhibition may be noted as a condition of shock. Some years ago William James discussed the inhibitions of human efficiency and the means of release from such handicaps in his classic paper on "The Energies of Men." He notes the well-known phenomenon of feeling more or less alive on different days, how every one is aware of slumbering energies which the stimulus of the day does not call forth. He says:[29]

> Most of us feel as if we lived habitually with a sort of cloud weighing on us, below our highest notch of clearness in discernment, sureness in reasoning, or firmness in deciding. Compared with what we ought to be, we are only half awake. Our fires are damped, our drafts are checked. We are making use of only a small part of our possible mental and physical resources.

A Mental Second Breath.—His general thesis James expressed as follows:

> The human individual lives usually far within his limits; he possesses powers of various sorts which he habitually fails to use. He energizes below his maximum, and he behaves below his optimum. In elementary faculty, in coördination, in power of inhibition and control, in every conceivable way, his life is contracted like the field of vision of an hysteric subject—but with less excuse, for the poor hysteric is diseased, while in the rest of us it is only an inveterate *habit*—the habit of inferiority to our full self—that is bad.

James suggests also the possibility of a mental second breath and the help that comes from the stimulus of excitement and shock, and he cites concrete cases where a conversion, a love affair, a great shock, or the devotion to a new cult or what not, raised the individual to a higher level of activity, and greatly increased his efficiency, so that thereafter he was able to live on a higher plane as a result of the hidden sources of energy tapped by the emotional experience.

Release from Inhibitions.—To-day with our increased knowledge of the functioning of the nervous system in relation to the endocrine glands, and the fundamental principle of hygiene as an optimum balance between stimulation and response, we can understand more clearly both the physiology and the psychology of the phenomena that James discussed so brilliantly. Probably in many of the cases cited, the real psychology of the individual's improvement would be found in a removal of inhibiting associations, a release, perhaps, from the results of repressive education, the inhibiting accumulation of a lifetime.

The facts in regard to the normal functioning of the human mechanism, especially the nervous system, the endocrine glands, the muscles and the digestive system, suggest the reason that it is possible for the same individual to function on a low level or on a higher level, according to the stimuli provided. Let us recall the main points. Where weak stimuli affect the organism, the energy expended is relatively small and the time required to build up the tissues destroyed relatively short. Our nervous system, under the stimuli from the sense organs and the glands, which, in turn, respond to the stimuli of the nerves, functions apparently in rhythmic periods of anabolism and katabolism. After

the explosion of energy, a certain period of rest is necessary for the building up processes, a process well illustrated in the refractory period of the nerve when it refuses to respond to stimulation and in the longer rhythms in the rest and metabolism of sleep.

This, however, is only half the story. Just as the building up of tissue and the storing of energy are necessary for vigorous explosion of energy in the functioning of the brain and nervous system, so, on the other hand, the vigorous explosion of energy seems to be a necessary condition for the proper building up of tissue and the storing of energy in a succeeding period of rest. Apparently for many individuals whose nervous systems have never functioned on a higher level, vigorous explosion of energy in vigorous functioning has never occurred, so that the necessary condition for building up and storing adequate energy has never been present. Once produce this more vigorous explosion of energy by some unusual stimulus, then it becomes physiologically possible for the individual organism to function on this higher level.

That this conversion of the individual from an organism functioning on a low level to one functioning on a higher level is possible has been shown in many cases of so-called nervous disease and apparently in many cases where no obvious disorder was present, such cases as those cited by James, where the stress of a crisis or the like put the individual on a higher level of efficiency.

Thus, naturally, it comes to pass that in a large number of cases nervous disorder or the like may be cured merely by removing the inhibitions that cause the trouble, and any stimulus strong enough to inhibit the inhibition is efficacious.

5. *The Group*

Among the conditions that influence human behavior, one of the most powerful is the stimulus of the group. This has a facilitating or inhibiting effect, according to its relation to other conditions. Usually the effect is stimulating. Experiments have shown that in most situations a child can do more work and do better work in a group than when working alone.[11] In case of very timid children, of course, the effect of the group may be inhibiting. Again, the effect of the group is to stimulate certain activities and to inhibit others; and, further, the influence is determined by the character of the group whether an organized group like a well ordered school or an unorganized group like an ordinary mob.

Everybody knows how the stimulus from a mob inhibits the self-control and ordinary inhibitions that usually keep man's baser instincts in check. Thus an orderly and self-controlled individual may lose control of himself when in a mob, and most conventional and well mannered persons will do things when in a group of people that they would never think of doing as individuals. The stimulus of an organized group tends to remove the inhibitions from fear and worry and the like. Many different groups have this wholesome influence.

The School Group.—In dealing with the school as a class we have the usual conditions of group psychology, and conditioned reflexes in connection with the group may easily be formed. Thus children who suffer from some physical or mental defect, or who come from poor homes, or the only children in a family, or those whose social development has been arrested by the unwise discipline of ignorant parents and by a narrow environment, are liable to bring to the school unnatural in-

hibitions and a self-conscious attitude toward the school group, and thus most unfortunate social relations are liable to develop.

In a well disciplined school the influence of the group makes distinctly for healthful mental attitudes and makes self-control and calm and coördinated activity easy. The stimulus of the group in a good school tends to remove the handicaps and inhibitions that retard a person's efficiency.

The Church Group.—Where it is possible to combine two of the inhibition-preventing conditions that have been mentioned, the effect in removing the mental inhibitions and emotional stress and strain is noteworthy. The frequent inhibitions from the ego-complex are sometimes removed in this way. This often happens where the stimulus of the group and the influence of religious emotion are combined, as in many groups of devotees and not infrequently in a group of worshipers at an ordinary church. Miss Harris has apparently drawn a truthful picture of what often occurs.[26]

No matter what these people have done during the week, they drop that secular and carnal expression; they are now innocent of themselves. It is very touching. You may scarcely distinguish the worst of them from the best of them. The man seated there at the end of the bench, whose very hair snarls, whose face is marked with so many lines of human frightfulness, seems now in this shadowy peace only to have been weather-beaten by exposure in some harsh, windy corner of life. The evil in him shows for what evil really is, a sort of ugly pathos. This woman on the other side of the aisle, who is a termagant in her own house, wears an air of repose, as if for this hour she had been eased from the worry and flurry of doing her duty, right or wrong. The veriest gossip of them all looks like an elderly handmaiden of the Lord ready to fall upon her knees and wash the feet of the saints. And

the others, the plain script of the congregation, are so submissive, so completely at rest from themselves and from their neighbors.

This is not hypocrisy, it is the church; the effect of its silence and the association of ideas for which it stands in the minds of these people.

It should be carefully noted that the truth or error of the beliefs held by the group and the character of the aims and work of the given group do not necessarily have anything to do with the psychological efficiency of the group stimulus in removing inhibitions. One can note the happiness and content on the faces of the devotees of dogmas and creeds for which there is no satisfactory evidence; and probably the same would be true of the members of the social groups of the most unusual and bizarre sects in Russia and among primitive peoples.

6. *A Sense of Humor*

The American people have a sense of humor, and the psychology of humor is largely familiar; but its significance for mental hygiene has been neglected. One's sense of humor has an antitoxin function. It is the great mental disinfectant. Unfortunately, most of us lack a sufficient amount of this to disinfect the total content of our minds. Unfortunately, also, there seems to be something about the dust of the schoolroom that dulls the sense of humor. An English writer has said that a teacher, from the very fact of his profession, can not have a sense of humor.

To speak more literally, one of the functions of humor is the removal of inhibitions. The humorist acquires a feeling of superiority from his ability to see the comic aspects of human activity and especially from his own

witticisms. And for attacks that might cause a sense of inferiority, the humorous retort is the best defense. For a single case the story of a southern statesman in substance as follows will suffice:

Many years ago Alexander H. Stevens was a candidate for Congress. Physically Stevens was a small man, weighing perhaps ninety pounds. He had a joint debate with his opponent, a big six-footer, weighing two hundred pounds or more. In the course of the debate the big man made a personal attack upon Stevens and said, "You little shrimp, I could pin back those two big ears of yours and swallow you." Instantly Stevens replied, "If you did you would have more brains in your stomach than you ever had in your head." The feeling of inferiority that developed was not in Stevens.

Protects from a Sense of Inferiority.—A sense of humor is the sovereign prophylactic against the feeling of inferiority. According to one widely accepted theory of humor, the essential element in one's enjoyment of a humorous situation is the feeling of superiority that one gets; the feeling that one is distinctly above and superior to any such ludicrous mistake or error as that of the victim of the joke or the object of the humorous retort. However this may be, a sense of humor is at once the great preventive and the great cure of a sense of inferiority. One may well fortify a child against this by developing a sense of humor; and this is one of the cases where we may well beware of destroying in childhood what is especially desirable as a characteristic of adult life. In checking the joking and frivolity of childhood we should not develop the attitude of the pessimist, or the specialist in foreseeing calamities, or of the egoist who takes himself or the world too seriously.

Humor is usually the foe of inhibitions of every

kind. The common jokes and stories are apt to be at the expense of people who are supposed to represent interference and inhibition, the mother-in-law, the school teacher, the pedant. For thousands of years they have been the butt of popular jokes, and the same is true to-day. When Wilson was President, his opponents always liked to jibe at his schoolmaster habits and manner of looking at things. To be called a schoolmaster is apt to be a joke in itself.

The Enemy of Things Taboo.—Again, among the favorite subjects for humor are things that are taboo, matters relating to the grosser functions of the body, the intestinal tract, bootlegging, and the like, and all the taboos of sex and religion. Unconventional language and profanity are examples. Thus a very poor and banal joke raises a laugh if expressed in what a feeble-minded man once called "profane languages."

The value of humor in the schoolroom is great. Ludicrous situations are bound to occur. Children are pretty sure to see the humorous aspects of things. It is unfortunate if the teacher does not. A good genuine hearty laugh in the schoolroom is a most wholesome means of removing unfortunate inhibitions. Speakers who understand the psychology of social groups when they confront a hostile audience usually begin by telling stories and the like that compel laughter and thus remove the more hostile attitudes.

7. *Consciousness*

A number of other conditions that help to remove inhibitions might be noted. Some of these may best be considered by discussing consciousness in relation to various inhibitions.

If we may adopt for the moment the current vague and

somewhat mystical conception of the unconscious, we may note that consciousness and the unconscious are in some respects mutually inhibitory. Freud has shown how in many ways the unconscious inhibits our conscious processes. On the other hand consciousness is often an inhibiting factor.

It has been a favorite theme for psychologists to show how perfect and infallible are the processes of the unconscious, how imperfect and uncertain are those regulated by consciousness. Innumerable examples are given of the sure and accurate character of our automatic behavior, of the uncertainty and inaccuracy of our conscious performance.

To a large degree consciousness is an inhibiting factor, especially in the child and in primitive man. Now then with consciousness especially self-consciousness as a universal form of inhibition, why should not this be utilized as an agent for inhibiting the inhibitions themselves? Some general vague idea of the possibility of this has long prevailed. The pessimism of the German philosopher Hartmann was transformed into a practical optimism by his doctrine of the therapeutic function of consciousness. The blunder of creation, he maintained, may ultimately be remedied by a voluntary act of world consciousness. In varying forms this belief in the healing power of consciousness has been held by more recent students; and a multitude of concrete cases studied by psychiatrists have shown that the mere bringing to consciousness of repressed feelings, fears, and disturbing complexes of ideas, is in itself a healing process. When childish attitudes of envy, jealousy, selfishness, and extreme individualism have survived, the mere revelation to the patient of the fact

that these are the attitudes of a child often has a marvelous effect in reducing or banishing them.

A contribution has been made by Crile in a concrete attempt to utilize the inhibiting power of consciousness in the case of fear itself. He and Cannon as well have noted that since they began the study of the physically injurious effects of fear they have been able to bear their own personal trials and anxieties with greater equanimity, since the knowledge of the injurious results of fear acts as an inhibition of the fear itself. Crile says:[16]

> I have found that if an intelligent patient who is suffering from fear can be made to see so plainly as to become firmly convinced that his brain, his various organs, indeed his whole being, could be physically damaged by fear, that this same instinct of self-preservation will, to the extent of his conviction, banish fear. It is hurling a threatened active militant danger, whose injurious influences are both certain and known, against an uncertain, perhaps a fancied, one. In other words, fear itself is an injury which when recognized is instinctively avoided. In a similar manner anger may be softened or banished by an appeal to the stronger self-preserving instinct aroused by the fear of physical damage, such as the physical injury of brain cells. This playing of one primitive instinct against another is comparable to the effect produced upon two men who are quarreling when a more powerful enemy of both comes threateningly on the scene (p. 74).

8. *Associated Responses*

Overlapping the above, an important means of inhibiting an injurious reaction is by what Woodworth and some other psychologists have called a substitute, transferred or associated response, probably, in most

cases, a conditioned reflex. Woodworth describes this as follows:[57]

The *substitute response* is another modification to be placed alongside of the substitute stimulus. Here a natural stimulus calls out a motor response different from its natural response. The muttered imprecation of the adult takes the place of the child's scream of pain. The loose holding of the pen between the thumb and the first two fingers takes the place of the child's full-fisted grasp (p. 299).

This he illustrates from the training of rats to respond to a door marked by a yellow disk:[15]

Learning to respond to a signal might be classified under the head of substitute stimulus, since the rat learns to respond to a stimulus, the yellow disk, that at first left him unmoved. But more careful consideration shows this to be, rather, a case of substitute response. The natural reaction of a rat to a door is to enter it, not to look at its surface, but the experiment forces him to make the preliminary response of attending to the appearance of the door before entering it. The response of attending to the surface of the door is substituted for the instinctive response of entering. Otherwise put: the response of finding the marked door and entering that is substituted for the response of entering any door at random (p. 305).

Some of the cases of children given by Pfister are apparently cases of conditioned reflexes. He says:[10]

Sometimes the repressed feeling is smuggled into the conscious in the company of quite another image or group of images. In doing so it attaches itself to some insignificant but characteristic detail. The repressed hatred of one person may be manifested towards someone else if the latter has by any chance any—possibly almost imperceptible—exterior traits in common with the hated person. The name, the atti-

tude, the shape of the nose, a gesture of the hand—any of these may not only suffice to evoke the repressed image of a hated person, but also to unchain feelings associated with this image.

Their Value for the Mental Health.—Commonplace examples illustrate the value that substitutions of associated responses may have for the mental health of the individual. For example, if a man strikes me, I may react by a natural response and knock the man down, or I may philosophize in regard to the matter and reflect that a gentleman will not insult me and that no other person can, and this mental response may take the place of the physical response. Anything whatever in the form of an adequate mental response is just as hygienic as the physical response; the chief difficulty is that few persons are sufficiently trained and have had sufficient experience in life to substitute an adequate mental response for the native physical reaction; but this is always possible, and a large part of the training in ethics and mental hygiene consists in developing such associated responses for the stimuli of the emotions of fear, anger, and the like.

Freud's Four-fold Contribution.—Among the contributions of Freud to mental hygiene is what, with apologies to Schopenhauer, might be called his fourfold teaching in regard to normal reaction to feeling, in showing: (1) the need of adequate response to human impulses and feelings; (2) the injury likely to result if adequate normal reaction is prevented; (3) that substitute responses to feeling are possible and that anything whatever of a character fitting the individual needs may take the place of the direct natural response and function as a surrogate; (4) that a purely mental response

in a series of associations may be just as adequate a response as a physical reaction.

The educational and hygienic significance of this teaching is obvious. The one thing that should be especially emphasized is that children from infancy should have training in response to feeling in direct natural reaction where this is legitimate, in delayed and substitute responses as the growing complexity of the child's social life makes this necessary, and, finally, in natural control of feeling by sublimation and the like.

As a matter of fact, the educational and hygienic significance of substitute responses has long been recognized by primitive peoples, in folk thought, and in ethical literature.

Pathological Cases.—The pathological substitute responses reported in great numbers by the psychiatrists emphasize the significance of such associated reactions for hygiene and the need of preventing the development in children of those likely to be injurious. It is easy for a child to get some associated response that will serve as an excuse for avoiding disagreeable tasks. All this is so obvious that it is commonplace, but the hygienic need of prevention is put none too strongly by Barker:[1]

> A child should never be permitted to use invented physical symptoms or nervous symptoms to escape from its duties. Many a child learns that he can stay home from school, or from Sunday school, or from dancing school, by having a headache. Children, as well as grown-ups, are tempted to invent some excuse in the hope that they may escape duties or occupations that are a little unpleasant or irksome to them at the time. The wise parent should see to it when the child says he has a headache and is permitted to escape some normal function, or some duty, on account of it, that he does not have too good a time. Let him stay in bed with restricted diet, restricted companionship and restricted activities until the

headache is better, and then if he has been fabricating his headaches he will not have them so often (pp. 247-248)

The Victim of the Substitute Responses.—As a matter of fact, the Freudians are by no means the only ones who utilize substitute responses. Anything whatever that fits the individual may serve as a surrogate. Most people make substitute responses. It is a healthful device, so far as the individual is concerned; but another side to the whole matter, by no means a matter of indifference to mental hygiene, is the effect on the individuals who are the objects of the substitute responses. Most people, in the stress and strain of business and the friction of domestic or social life, make their substitute responses not wisely but too well—the husband getting up in the morning with a grouch, the result perhaps of the stress and worry of his daily work, vents his feeling, thoughtlessly, perhaps, but no less seriously upon his wife at home; or, starting the day wrong, makes his partner or clerk or companion the victim; and when he comes home at night, the good wife, smarting from the response in the morning, aggravated by a hundred trials and hindrances during the day, in turn makes a substitute reaction on the husband, the surrogate.

Suggestions for Training.—A great part of our training in manners and morals, such as it is, consists in choosing the right surrogate for our feelings and in developing right substitute responses for the thousand trying situations of daily life. To adults and their proper training, mental hygiene gives little time and attention. The serious cases may be referred to the psychiatrists and the courts, the less serious ones are not worthy of much attention; but children should be trained to right substitute responses and to fit into the

trying situations of modern life without injury to their own mental health or the happiness and health of their companions. Methods of giving such training must be developed by trial and experiment. One or two suggestions, however, are obvious.

1. First is the obvious means adopted by a little girl whose diary has often been quoted: "You should act the way you feel and you should feel the way you ought to feel; and if you cannot act the way you feel and feel the way you ought to, then go away." The natural healthful response for children in certain situations, where neither courtesy on the one hand nor a wholesome fight on the other is adequate, is to go away and "set up the game in another alley"—change of the social environment.

2. Second is an objective attitude toward one's own emotions, feelings of injured pride or self-respect, and, most of all, an objective attitude toward the unjust and discourteous reactions of others. Children learn to take this objective attitude more readily, perhaps, than we suspect and can probably do it as easily as adults. With a little help they readily see that some of their playmates have not been properly trained, that some of them are not well; and they are always ready to condone the violent reactions of the child with a toothache, a sore hand, or an aching head.

3. Nothing so quickly takes the poison out of the wound from an unjust or even cruel substitute response by one's companion as the ability to see the response in the light of the real humor of the situation. Even a child sees that it is ridiculous for his companion, merely because his tooth aches, to strike his playmates, or for his father to have a grouch all day because his coffee was cold at breakfast: or for his school teacher to scold the

pupils to relieve indigestion and a nervous headache. If my neighbor on life's stage persists in playing the fool, why should I not laugh at him? If playmate or companion or teacher sees a mountain in a grain of dust, why should not a child get all the amusement that naturally comes from observing such marvelously microscopic vision? Children should be trained to respect their elders, but proper development of the sense of humor will not humiliate the old because it sweetens the temper of the young. Again we see the value of humor as the mental disinfectant.

Influence of Associations on Health.—Although psychologists are rightly cautious in speaking of mental stimuli and in drawing analogies between the association of ideas and the association of stimuli in the practical matters of education and hygiene, we cannot fail to recognize the influence of ideas and associations of unfortunate character upon the behavior and the health of individuals. This was pointed out long ago by John Locke and has been illustrated in manifold ways in all human activity and has been a commonplace in mental hygiene and common-sense education ever since his day. No one, however, saw their hygienic significance more clearly. He says:[9]

> This wrong connexion in our minds of ideas, in themselves loose and independent of one another, has such an influence, and is of so great force to set us awry in our actions, as well moral as natural, passions, reasonings, and notions themselves, that perhaps there is not any one thing that deserves more to be looked after (p. 531).

Interference of Association.—Freud has rightly noted that errors and accidents are to be explained largely by interference of association or interference of will im-

pulses. To put it in his exact words, errors are "valid psychic acts. They have their meaning, they arise through the collaboration—or better, the mutual interference—of two different intentions."

Many illustrations of associated responses have been given by Freud. Where the natural response would be something abhorrent to the individual's character or something extremely unconventional or something contrary to the accepted code of ethics in one's community, then some other response which is endurable by the patient is likely to be substituted. Thus even a distinctly painful reaction may become the associated or substituted response in place of a train of thought or a course of behavior which would be natural to the given stimuli.

The Objective Attitude.—Although, as we have seen, a child is at the mercy of any incident or any accidental change in its environment, on the other hand, perhaps an equally slight incident or change in the environment may inhibit or take the place of the inhibition itself. The inhibiting associations or obsessions are apt to be repressed. At least, the child keeps them secret and does not talk about them. In such cases the mere description of the experience to another, the mere expression in words of the repressed experience, may be quite enough to bring about the inhibition and cure of the trouble. Confession is only the best known example of this. The following instance I cite in substance as related to me by Mrs. C. A. Dickinson.

I told a high-school friend of mine that my husband and I were interested in mental hygiene. She laughingly replied that she did two peculiar things which she seemed unable to stop: one was a habit of outlining every object within her view, not only following the lines with her eyes but feeling that she was really drawing them because the muscles in the

upper part of her stomach grew tense, and if no interesting stimuli intervened and she had to stay in any one place very long her stomach grew weary from the work. She said that she "drew with her stomach." The other habit was to read every automobile number that came within her vision. Sometimes she found that she had kept repeating the number—for another number would come before her and she would think with surprise, "that isn't the right number," but she would immediately change to it.

The objects might be of any shape. She drew but one line for each leg to a table or chair, drew but a square or oblong or circle for the top, as a child would draw. She didn't know when either habit had started, had them both since she was a child. She had tried to reason herself out of them. We had talked it over thoroughly. A few afternoons later when M. and I were together I said to her, "And what have you drawn this afternoon?" and she answered with some surprise, "Why, I don't think I have drawn anything." I didn't mention it again for a month, then she said, "The only thing that I draw now is your husband's collar, just as I did the first time I saw him." Five months later she said that she had not read an automobile number since the first afternoon she talked with us, that she saw numbers without needing to read them and occasionally felt a lightness or freedom when she saw an automobile and knew that she needn't notice or read its number. The only thing she had felt to "draw" since that first afternoon was my husband's collar, and she had not done that since she had told me of it, though she had seen my husband with his collar several times she had not noticed it. She says it is a very distinct relief to be free of the two habits.

It is noteworthy in this case that the mere change from the subjective self-conscious attitude tinged with shame and fear making the young woman anxious to keep these habits secret, to the objective attitude where she realized that such habits were not uncommon, an attitude tinged with interest and a sense of humor, was

quite enough, together with the description of the habits in words, to effect a cure.

9. *Coördinated Activity*

Finally, we have the sovereign and universal remedy and preventive of injurious inhibitions in coördinated activity. As already suggested, no fundamental human impulse is more potent in preventing inhibitions than the instinct of workmanship so-called when sublimated into coördinated activity, either physical or mental. As this has been emphasized again and again, it need merely be mentioned here. Every normal child is protected from over inhibition by this fundamental impulse. He is protected by every habit of coördinated activity in the doing of significant tasks. Where unfortunate habits have been formed, it is always possible to go back of them and build up again new motor habits on the basis of this primitive impulse to activity. As will appear in detail later, in order to prevent conduct disorders, the development of purposive activity in the doing of tasks is the reliable method. This is illustrated in a million schoolrooms. To cite examples of normal children engaged in such activity is unnecessary. They are familiar to every teacher. New emphasis is placed on this, however, by some of the pathological cases mentioned in later chapters.

It should be remembered that coördinated mental activity is quite as effective as physical activity. Thus all consecutive and logical thinking, all forms of analytical introspection even, are so many different methods distinctly effectual if one has the ability to carry them out. Hence the great advantage of having many and diverse permanent interests.

Relief by Expression.—A few favored individuals with artistic and literary ability have found the best means of reacting to personal feeling and inhibiting the injurious mental attitudes of worry, depression, and the like, is to write out a verbal expression of their feelings. Thus Amiel and others found relief by writing an intimate personal diary. Goethe is said to have relieved his feelings when depressed by writing a poem; and some of Lord Byron's best poems were written as the expression of anger and rage.

Again for those who have psychological interests, such feelings are decreased or inhibited altogether by an attempt at psychological analysis, at finding the genesis and causal relations of the inhibiting feelings, and by describing them analytically.

Such objective mental exercises give surprising relief from depressing emotions, anxiety, and unfortunate attitudes. The fact that the activity is mental, rather than physical, increases rather than lessens the benefit from the exercise. It matters not whether the device be conventional or bizarre if it only fits the individual case. The more original the form of the objectification probably the better, if it serves as the necessary inhibition of the inhibiting attitudes and ideas.

Drugs.—Such are some of the means of removing injurious inhibitions. Besides these are many artificial means that can sometimes be used by physicians. Especially efficient are certain drugs like alcohol and the various forms of opium. Thus morphine is used by Crile, and many other surgeons before an operation to inhibit fear. The great advantage of this, when rightly used, has been shown by Crile in his book on *Anoci-association.*

Alcohol is a depressant. The older idea was that

its effect is to reduce all physical and mental processes. Recent investigations, however, have shown that though it depresses certain processes, it improves others. The careful investigations by Dodge have, I think, shown satisfactorily that this increase of function is largely due to the effect of the alcohol in removing inhibitions. The stock illustration with which every one is familiar is the great linguistic fluency after relatively small doses of alcohol. Such artificial means of removing inhibitions are not usually necessary. It may be added, however, that along with drugs Crile would recommend a philosophy of life. He says:[15]

> The emotional drive with its consequences, identical with the consequences of infection, exertion, or physical injury, is best met through training and education leading to a philosophy of life that insulates the individual against destructive psychic stimuli. Thus may the individual be anociated in the large clinic of life, just as through local anæsthesia the patient is anociated against the drive of the surgeon's knife (p. 53).

For the benefit of those who fear such statements, it may be added that when we know more about the functioning of the endocrine glands we may learn that the philosophy of life or the substitute response in such cases inhibits an injurious secretion of hormones from these glands just as surely as a drug.

The familiar psychology of association gives the proper point of view in mental hygiene. If we make it our servant instead of our master, it furnishes control for the inhibiting, distracting and disintegrating emotions and attitudes that beset us. Such is the message of mental hygiene. In the mere control of the common inhibitions the significance of mental hygiene is shown in large letters.

Summary

In general, the following are some of the means available for removing inhibitions:

1. The inhibiting effect of fatigue.
2. Sleep.
3. The fundamental emotional responses.
4. Shock, that is, violent emotional reaction or the like.
5. A vigorous reaction in relation to the inhibition itself, as, for example, in doing the thing one is afraid to do.
6. Coördinated motor activity.
7. By inhibition from associated ideas or mental attitudes, that is, coördinated activity in the mental field.
8. By a sense of humor.
9. The stimulus of the group, especially that of an organized group.
10. The inhibiting effect of consciousness.
11. Artificial means, especially certain drugs, for example, alcohol and opium.
12. A philosophy of life.

Problems and Questions

1. The next time you are depressed, out of sorts, worried, try the following experiment: first, analyze the feeling; second, describe the feeling in verse or prose; third, tell a friend about it; fourth, take up your day's task without regard to it. Note which plan succeeds best.
2. When you feel a sense of inferiority try a similar experiment.
3. Describe other means of removing inhibitions not mentioned in the text.

4. According to Pavlov sleep and inhibition are essentially the same, but inhibition is local, sleep is general. Can you give any evidence for this?
5. What would be the advantages of a health examination at school entrance for detecting unfortunate inhibitions?
6. What methods and activities in the schoolroom tend to remove unfortunate inhibitions?
7. What habits, mental attitudes, or the like, are the most injurious inhibitions that teachers have to contend with?
8. Give a brief summary of the main points presented in this chapter.

CHAPTER XIV

INHIBITION: FEAR

Conditioned Emotional Inhibitions.—The story of the imperative hippopotamus association cited at the beginning of Chapter XIII represents an *n* or indefinite number of inhibitions and injurious stimuli, some trivial, some serious, some normal and healthful, some pathological. The most striking examples of these inhibitions are perhaps those furnished by the emotions. Not only do many children carry throughout life the effects from some shock of fear in childhood; but infantile attitudes of jealousy, of dislike, or some more-or-less grotesque mental twist, frequently become permanent and serious inhibitions. We may take fear for an example.

Of the conditioned emotional reactions, those connected with fear are perhaps the most universal. It is easy to show their importance and value. Hygiene, it may be said, depends largely upon fear of disease and of discomfort. Rather, it is not fear at all, but fear in the sense of prevision and precaution that is an essential of hygiene both somatic and mental. "Education," says Patri, "consists in being afraid at the right time." Fear at the wrong time, however, is a serious and apparently universal inhibition. Usually it is the wrong time. Hence in mental hygiene it demands special study.

The Mechanism of Fear.—In rough outline the mechanism of fear is simple. Primarily, it is determined by

the physical condition of the individual. It is a matter of endocrine glands, digestion, and sleep. From another point of view it is a matter of stimulation, association, and training.

The original stimuli that cause fear may be summed up briefly under one general statement as follows: any sudden or violent change of stimuli produces fear, and thereafter anything that may become associated with the primary causes of fear may likewise produce the same emotion. Or, to put the matter in terms of common experience, in case of the individual child there are especially two or three primary causes, such as loud noises, removal of support, and the sudden movements of objects in contact with the child or near it, and many secondary causes by association.

Except in childhood we seldom are placed in situations to receive the biologically adequate stimuli to fear —loud noises, violent removal of support, etc.—or we have become immune to these stimuli. Really they are few in number. The secondary stimuli, or conditioned stimuli to fear, however, are many and varied. Not only fear of a thousand indifferent stimuli associated with the original occasions of fear, but fear of failure, either by not doing things essential or by doing things injurious, fear of not thinking of the right things at the right time, or fear of thinking of certain things that are dreadful in themselves, not only fear of failure, but fear of fear itself, fear of one's own thoughts and emotions, quite as much as fear of physical acts.

Devices for Inhibiting Fear.—Watson has studied the compensatory devices that inhibit fear. As an example of these is thumb-sucking in the infant. In regard to this he says: "Thumb-sucking is a compensatory device for blocking fear and noxious stimuli. During the

course of these experiments (with his boy Albert), especially in the final test, it was noticed that whenever Albert was on the verge of tears or emotionally upset generally he would continually thrust his thumb into his mouth. The moment the hand reached the mouth he became impervious to the stimuli producing fear." Again, give him his blocks, and the motor impulse inhibited both the fear and the thumb-sucking.

The methods of removing conditioned emotional responses, as summed up by Watson from the point of view of his laboratory studies, are distinctly in harmony with what has been stated. Among the methods suggested are the following: (1) constantly confronting the child with the stimuli that called out the fear responses, in order that dulling by habituation would occur; (2) by trying to recondition by showing objects calling out fear responses simultaneously with stimulation of tactual erogenous zones; (3) by trying to recondition by feeding candy or other food simultaneously with the fear-exciting stimulus; (4) by building up constructive activities around the object by imitation and by putting the hand through the motions of manipulation. Imitation of overt motor activity is strong at this age, according to Watson's experimental results.

It is especially noteworthy that constructive activity could be subsituted for the primitive and undesirable reactions. The same is probably true of all normal children.

Coördinated Activity the Universal Preventive.—Just as we have found, in general, coördinated activity is the universal means of preventing unfortunate inhibitions, so in like manner it is the most universal and reliable means of preventing and controlling fear. Fortunately, the impulse to activity is as fundamental as fear itself.

On this we can by training build the best protection. The form of this activity may be either physical or mental.

Plenty of motor and other devices for inhibiting fear are resorted to both by children and by adults. With older children whistling or singing to keep up one's courage, putting the hands in the pockets of the trousers, and the like, are well-known examples. For many individuals smoking probably is a device par excellence for keeping up one's morale. The soldiers in the trenches would undoubtedly have been greatly depressed had they been deprived of cigarettes.

Mental Means of Preventing Fear.—In the mental field anything whatever may become associated with the fear-producing stimulus as an inhibition. Apart from other emotions that inhibit fear, the most effective are the knowledge of facts, which show the fear to be unfounded, of means of removing the object of fear, the memory of past successes in overcoming fear, and so on, with a whole series of preventives up to the sublimated attitude of the hero who feels that it does not matter whether he is afraid or not; but a vast number of simple, even banal and grotesque associations, may be distinctly effective. Anything whatever that serves as a means for thoroughly concentrating attention will act as an inhibition.

The mere knowledge of the fact that violent change of stimuli causes the fear—this itself may become an associated idea that tends to inhibit the fear. The individual says to the fear-producing situation, I know the secret. With a little easily made apparatus I could do the trick myself. If in no other way, this reduces the fear by the fact that it represents so much coördinated

thinking, which, like coördinated action of any kind, is a universal remedy.

Some people think of a maxim or proverb which they have associated with fear or worry as a means of protection. "Do not cross any bridges until you come to them," "It is an ill wind that blows no one any good," "It is a long lane that has no turning"; these are cases in point. Another person uses this: "I can stand the troubles of other people, why can I not stand my own?"

A hundred such maxims are used. It matters not how banal they are, if, as associated stimuli, they are strong enough to inhibit the fear. Anything that fits the individual case is effective. One of Walton's patients was helped in regard to her fear of people by the thought the doctor gave her that "others don't mind if you do make a fool of yourself. In fact, they rather like it."

General Grant, the man of iron, of whom General Porter said, he was one of the only two men he ever knew who could sit upon his horse perfectly unmoved during a rattling musketry discharge, was human and had his fears like the rest of us and used a similar remedy. He tells us that in the stress of impending battle he used to reflect that the enemy was just as much afraid as he was.

The customary method has been to associate dreadful events and calamities with the undesirable stimulus. The thought of death or disease or imprisonment or some form of disaster have always been appealed to. Thus some of our maxims have arisen: "Always so act as if you knew that you would die to-morrow"; "Finish each day's work as if you knew it were your last," and similar sayings.

To-day it is recognized that a different form of association is better. As Chesterton has pointed out, it is far better for a young man to keep straight by thinking of the Virgin Mary than by thinking of disease; and it is better usually for a child to think of pleasant and inspiring situations and of worthy and beautiful characters than to form associations in themselves liable to be injurious to health. Best of all are the associations connected with coördinated activity, physical and mental, in the doing of a task worth while.

These rival stimuli that inhibit the inhibitions and save the child and man from fear are themselves also unstable and easily destroyed. Laugh at a child for taking refuge with his mother in a thunderstorm, and he may lose his confidence; sneer at a man for carrying a charm or relic, and he may find that the virtue has gone out of it. Cast doubt on the faith of the saint, and his fear may return. A pathetic story recently come to me from Japan illustrates this.

A poor ignorant woman, a child woman like many we have in this country, learned a passage from the scriptures of Buddha. When in situations of stress and fear, she repeated the words of this text, and her trouble disappeared. She repeated them to others when they were ill or worried, and they too were helped. One day she repeated this passage in the temple in the presence of a boy priest. He laughed at the words; told the woman they were incorrect, and taught her the correct form. Thereafter she repeated them correctly, but they had no virtue, she could help neither herself nor others. The prig of a priest had given her the letter and had killed the spirit.

I am well aware how imperative even our secondary fears are and how futile psychology is likely to be in

the face of them; but children, at least, can largely be trained to fear-controlling associations.

As everybody knows, however, some causes of fear are so deep-seated and the emotional condition so permanent that nothing whatever seems to be really effective. All the maxims and all the rival stimuli and associations are impotent, and all our practical psychology futile in the case of some of the really heart-rending situations as they occur in the lives of some peculiarly sensitive individuals. One is threatened with a disintegration and collapse of character and personality. In such cases the one real remedy is the insight that, after all, it does not really matter whether one be afraid or not, if one only does one's duty. And thus, if one has the will to determine action, even in its last and most deadly attack, fear is vanquished.

The psychology of this ultimate and universal remedy has been suggested by Bernard Shaw in his play *The Man of Destiny*, in which he puts the following words into the mouth of the great Napoleon:

> There is only one universal passion—fear. Of all the thousand qualities a man may have, the only one you will find as certainly in the youngest drummer boy in the army as in me is fear. . . . Fear, I know well, better than you, better than any woman. I once saw a regiment of good Swiss soldiers massacred by a mob in Paris because I was afraid to interfere. I felt myself a coward from the tips of my toes as I looked on at it.

Then he refers to the way when it is necessary to do a thing in spite of fear, the fear tightens one's grip on one's own purpose, ceases to be fear, and becomes strength, penetration, vigilance, iron resolution.

Fear Has a Useful Function.—Fear, as already noted, has an important and useful function; but it is difficult to say just how far this is normal and when it becomes injurious or pathological. This is well illustrated by the experience of the soldiers in the stress of continued warfare. Coningsby Dawson says that there came a time when the only thing one thought much about, and one's only fear was, a supreme fear lest one might fail to do one's duty. But it is desirable that even this sublimated fear should be controlled by certain inhibiting associations.

Direct Action as a Remedy for Fear.—The most drastic and usually the most effective remedy for fear is direct action. If you can induce a child to face what he is afraid of, then the fear disappears, and the object is apt to become a matter of special interest. Associated with it is the stimulus of success. It is the same with adults. A classic case is that of the Chicago police at the time of the Haymarket riot. Before that they had been timid and huddled together in fear of the anarchists. After the riot and the police had successfully met the situation, it is said they swaggered like the heroes of Waterloo, and one of them single-handed was ready to face a dozen anarchists.

Thus, too, the practice of psychiatrists in cases of morbid fear is to make the patient, if possible, do the thing that he is afraid to do and face the situation he is afraid of. If one is afraid that he will not sleep, he is advised to try to keep awake. If he is afraid of outdoor air, he is told to sleep with his windows all open. If he fears to eat this or that, he is told to eat anything whatever that he wishes to. This, too, is the method usually employed by parents and wise teachers in removing the fears of children. In case a child once

meets the object of fear there is at least on the next occasion the memory that he has met the fearful situation and is still alive.

It is so with every one. A year ago one of my friends, a mature man, the victim of many remedies and much advice, suffered from acute pain and a subtle and chronic fear. He was afraid to take exercise lest his sacro-iliac joint should slip, he was afraid to bear his weight on one foot lest it should injure him; in a word, he was afraid to do anything, lest it should bring on pain of the sciatic nerve. He gave up his work, shut himself up in his room, went to bed, went to the hospital, and would, I fear, have gone to the graveyard had not a new doctor come in who told him to get up and take any and all forms of exercise. To-day he does his day's work as a teacher, takes two hours of vigorous exercise in the gymnasium, and has no pain.

It is, of course, possible to overdo this method. It is possible that the individual may become such a specialist in meeting difficult situations and in attacking all sources of fear that an overcompensation may result. We are indebted to fiction for an attempt to describe a case of this kind. At one stage of the case Harry Leon Wilson represents his patient and hero expressing his feeling as follows:[56] "If I knew anything, any least little thing I was afraid of, I would go right off and do it, do it good and hard."

The fear of doing some mental act, and of thinking erroneously or improperly may be quite as serious as these fears of doing injurious physical acts.

The Case of John Bunyan

The best cases of this kind are apt to be rather complex. Space is lacking for such examples. A single

case, however, may be cited, namely, that of John Bunyan as child and adolescent. Fortunately his case has been studied by a competent psychologist, Josiah Royce.[45]

In his early life Bunyan was the victim of a nervous disorder accompanied by typical pathological mental states and insistent or fixed ideas. The account is given by Bunyan himself in his autobiography, and in the narrative contained in "Grace Abounding." This case is so instructive that attention to it in detail may well be given.

Bunyan was afflicted with what would to-day be called a sense of inferiority and with a mental conflict from discordant mental complexes of a religious character.

Of himself, Bunyan says:[21]

"My sins did so offend the Lord that even in my childhood He did scare and affright me with fearful dreams, and did terrify me with dreadful visions. I have been in my bed greatly afflicted while asleep, with apprehensions of devils and wicked spirits, who still, as I then thought, laboured to draw me away with them, of which I could never be rid. I was afflicted with thoughts of the Day of Judgment night and day, trembling at the thoughts of the fearful torments of hell fire" (p. 3).

Froude's Picture.—As Froude says of him:[21] "He judged his own conduct as he believed it was regarded by his Maker by whom he supposed eternal torment to have been assigned as the just retribution for the slightest offense." (p. 7.)

The picture of Bunyan at adolescence is given by Froude as follows:[21]

A tall, active lad, working as his father's apprentice, at his pots and kettles, ignorant of books, and with no notion of the world beyond what he could learn in his daily drudgery,

and the talk of the alehouse and the village green, inventing lies to amuse his companions, and swearing that they were true; playing bowls and tipcat, ready for any reckless action, and always a leader in it, yet all the while singularly pure from the more brutal forms of vice, and haunted with feverish thoughts, which he tried to forget in amusements. . . . They were the sins of a youth of sensitive nature and very peculiar gifts: gifts which brought special temptations with them, and inclined him to be careless and desperate, yet from causes singularly unlike those which are usually operative in dissipated and uneducated boys.

When at last he largely outgrew these tormenting visions, he felt that God had left him to himself, and had given him over to his own wicked inclinations, and then, according to his view, he fell into vice and ungodliness without further check. The evidence for this, however, seems to indicate that perhaps the worst of it was merely that he was fond of games.

"As to the act of sinning I was never more tender than now. I durst not take up a pin or a stick, though but so big as a straw, for my conscience now was sore and would smart at every touch. I could not tell how to speak my words for fear I should misplace them" (p. 37).

Conflict and Obsession.—Bunyan has related the characteristics of this pathological mental condition. There seems to have always been conflict and interference of association. This very naturally took the form of temptation by Satan. At prayer, for example, he was tempted to blaspheme, or the tempter moved him with the thought "fall down and worship me." Passing over this we may note the culmination of the condition as given by Professor Royce.[45] *

* From an article by Josiah Royce in the *Psychological Review.* Reprinted by permission of the Macmillan Co., publishers.

Finally his mental disorder took the form of a direct temptation to sell his Master. The tempter moved him to sell Christ for this or for that, whatever he might be thinking about or handling at the time. This affected him so that it caused an intense and terrible fear. He says:

". . . for it did always, in almost whatever I thought, intermix itself therewith, in such sort that I could neither eat my food, stoop for a pin, chop a stick, or cast mine eye to look on this or that, but still the temptation would come, *Sell Christ for this, or sell Christ for that; sell him, sell him.*"

By this time he was led to resort to apparently senseless motor acts. "By the very force of my mind," he says, "in laboring to gainsay and resist this wickedness, my very body also would be put into action or motion by way of pushing or thrusting with my hands or elbows." This, says Royce, grew to extravagant extremes

The loathsome triviality of the motor impulse itself, in its pettiness, and the vast dignity of the eternal issues imperilled, as Bunyan felt, by its presence, combined to give the situation all the dreadful and inhibitory features that had earlier been spread over so wide a mental range of evil interests.

This obsession in Bunyan's case, which lasted for about a year, was merely the product of his imagination and his sensitive nature. He was not tempted to give up his religion for money or preferment or anything of that kind. There was no prospect of any worldly advantage to be gained by abandoning his religion. But the obsession persisted.

The Cure by Direct Action.—Finally the reaction came. Bunyan describes it as follows:

But to be brief, one morning, as I did lie in my bed, I was, as at other times, most fiercely assaulted with this temptation . . . the wicked suggestion still running in my mind, *Sell Him, Sell Him, Sell Him, Sell Him,* as fast as a man could speak. Against which also, in my mind as at other times, I answered, *No, no, not for thousands, thousands, thousands,* at least twenty times altogether. But at last, after much striving, even until I was almost out of breath, I felt this thought pass through my heart, *Let him go, if he will!* and I thought also that I felt my heart freely consent thereto. Oh, the diligence of Satan! Oh, the desperateness of man's heart!

Now was the battle won, and down fell I, as a Bird that is shot from the top of a tree, with great guilt, and fearful despair. Thus getting out of my Bed, I went moping into the field; but God knows, with as heavy a heart as mortal man, I think, could bear; where, for the space of two hours, I was like a man bereft of life, and as now past all recovery, and bound over to eternal punishment.

As Royce describes the outcome:

The cure had come to pass, but it was, and remained, a cure with a pretty well-defined defect. The tempter could never again obtain control. The diseased habits were reduced to their elements, and were unable to systematize themselves afresh. The elements, however, proved, as one would expect in such a case, too deeply founded in this wonderful constitution ever to be eliminated.

But now—here is the important thing—all these permanent enemies are still, and remain for the rest of Bunyan's life, in no wise uncontrollable. His deeper consciousness is beset, but never overwhelmed, by them. His attitude towards them becomes objective, resigned. They teach him to "watch and be sober."

Factors in the Cure.—This case is not simple, but two or three factors in the cure are fairly clear. There was apparently the protective effect of repetition and fatigue.

As Royce has pointed out, the fears and depression persisted, but they were never so bad afterward. Again Bunyan was forced by the needs of his family and his own conscience to attend to his daily duties and so the protection of coördinated activity contributed its important share of the cure. Most important of all, however, seems to have been the fact that in a psychological sense Bunyan had really faced the source of his fear and found that he was still alive, that he was able to continue with his duties, and that his Master had not cut him off as an unprofitable servant.

Many children of an older generation, many to-day in some families, have similar religious fears and obsessions. This case illustrates modern as well as ancient history of childhood.

Illustrations of the interference of association from religious fears, chronic or acute, are common in the biographies of those of an older generation; although largely replaced to-day by different fears, the interference is hardly less serious.

Fear of a Mental Act.—The significant thing in Bunyan's case was the fact that his great fear came to be the fear of a mental act, the fear that he would in his mind sell Christ. There was no idea of real transfer, but he was afraid that he would commit this act in his thought; and this was what haunted him week after week and month after month. Finally, without premeditation but by impulse, he did the very thing that he was afraid he would do, and in his mind consented to the sale. The result of this was the cure. Apparently a clear case of the cure of fear by the doing of the thing he was afraid to do.

Whether the child's fear is in regard to his soul's salvation, fear of his own thoughts or fear of the dark,

the remedy is the same. Riggs has admirably described the kind of training necessary. In case a sensitive child is afraid, instead of telling him that it is silly to be afraid of a dark room, and that she ought not to be afraid, "she should be told that, of course, she is afraid, there are lots of other children that are afraid of the dark, even though there is nothing to be afraid of." She should be shown that we can get over a disagreeable thing like fear and that, of course, she is going into the dark room to get what she wants. She can thus be shown by actually going into the dark room how harmless the fear is and how easy and worth while it is to get what she wants. This little victory gives not only satisfaction but training, and such training is capable of turning timidity into habitual courage.

Impatience and Anger as Inhibitions

Although apparently not as common as the fear inhibitions, those from impatience and anger may be equally effective. They are probably common among students. Gehring reports a case in point. A literary woman was unable to write for a period of a year, accomplishing in that time no more than she had formerly done in a month. She would sit at her table, begin to write, feeling her mind full of material, but no sooner had she begun than an inability to express herself would develop, quickly followed by impatience and finally by intense anger. When first questioned, she was unable to explain what took place save that she seemed to be hopelessly involved in her mind and simply could not obtain further results. Thus she was really unable to write because the foreign emotion of anger would steal in and take possession of consciousness.

The doctor gave her a few simple explanations and

advice. She was instructed to sit down at her table prepared to write; and if the ideas would not come, merely to continue sitting there. It was not to matter if she did not write a sentence during the hour, but under no circumstances was she to yield to any feeling except that of perfect serenity. She was to feel responsible only for the maintenance of the proper mental attitude. When she found herself sorely tempted to yield to impatience, she resisted this. "Being a person of character, however, and having grasped the significance of the explanation in which the door being slightly pried open to admit one emotion the succeeding one would find easier entrance, she took pains to maintain her serene attitude, and in ten days was able to do her usual average of work."

This case is significant because all of us in some degree do similar things all of the time. In like manner the student may become impatient when he finds it takes so long to learn his lesson. As Gehring points out, so long as a professional man has good digestion and takes rational exercise and recreation and there is no undue strain upon him, he holds his own; but if, by indigestion or domestic trouble or the like, his balance is upset, he is likely to develop such a feeling of inadequacy, and then a host of possible fears and distrusts may be released.[22] * Self-consciousness itself becomes an inhibition, he yields to the slavery of fear, and his efficiency is likely to drop far below what is justified by his actual condition.

Fear in the School

The most general inhibition in the school, perhaps, is fear of some kind. Not only do pupils bring with them

* p. 182.

to school a vast number of fears, conscious or unconscious, from unfortunate experiences in pre-school life, but for many children the conditions of the school itself breed fear, and in many places a general condition of fear pervades the whole school system. The pupil fears the teacher, the teacher fears the principal or else the supervisor, the supervisor fears the superintendent, the superintendent fears the school board, the school board fears the parent representing the public, the parent fears Mrs. Grundy or else the pupil, sometimes both. Thus we have a vicious circle of fear relations; and, if in one community some of these fears do not appear, others are likely to occur, in any case fear of some kind.

This condition of fear apparently has always been connected with the schools more or less and, in some degree, exists everywhere to-day.

Instruction in Hygiene May Cause Fear.—Again by one of the strange ironies of modern education we have in some of the best schools a situation something like this. Knowledge, as we have seen, is the great preventive and remedy of fear. Thus it has been said with complete knowledge all fear would disappear; but the very means and methods of imparting knowledge become especially the conditions for producing fear—fear of failure and fear of the system, if nothing else. And again, hygiene, physical and mental, is the one supreme protection against fear, and yet in the study of hygiene, and in the practice of personal hygiene, some of the most subtle and serious fears are often developed. All this may sound exaggerated to those who have not given special attention to the facts; its seriousness may be suggested by one or two concrete illustrations. Richards reports the case of a boy:[42]

The story was that three weeks before, while in school, he had felt faint, dizzy, weak, his extremities had grown cold, his heart had beat fast "like a hammer," and he had thought that he was going to faint. The feeling had passed off in a few minutes. After a second attack in school several days later, his mother had put him to bed. . . . "All day he hollers, 'Mother, I die!' and keeps his hand on his heart."

Examination in the pediatric dispensary was negative. Questioning as to the events that preceded these attacks brought out the fact that the day before the first "spell" in school, the teacher had given a health talk to the children, and had stressed the importance of care in eating fruit lest the seeds and pits "go down the wrong way and kill you." In some way the child got the notion that if an apple seed slipped down his trachea instead of his esophagus, it would be carried by the circulation to his heart and kill him. Childlike, he had not confided his fears to any one. The wisdom of his conduct did not seem so questionable when later on the physician began to explain the situation to his mother and elicit her coöperation. Her first impulse, on hearing the story, was to punish the child for being so "dumb" and "crazy" as to cause her all this trouble.

The patient was assured as to the possibility of his fears being realized, and the parents were urged to ignore his complaints without ridicule, teasing, or punishment. The teacher also was more than eager to obtain and act on a new point of view. The patient had no further attacks of palpitation and faintness. . . . The situation was not difficult to handle, however, and in a month's time the fears and complaining reactions were things of the past.

The Ignorance of Adults.—That such cases appear grotesque and incredible to adults shows how ignorant we are of the content of the child's mind. A friend of the writer has reported a somewhat similar case.

As a little girl she was told by her teacher of the danger of lockjaw from being pricked by a pin in the palm of one's hand. This account of an accident, so

easy to occur, so tragic in its possible results, impressed the child deeply. That very night the disaster came, and the lethal weapon punctured the child's hand. Childlike, the fear was kept to herself, but imagining what disaster would occur if her jaws were hopelessly locked together so that she could neither eat nor speak, and with a precocious attempt at protection, that night before going to sleep she placed two fingers firmly between her jaws in order to have them locked open rather than closed. This means of prevention naturally tended to insomnia, but did somewhat relieve the fear; and with the blessing of the morning she found to her surprise that her organs of eating and speaking were in normal condition.

Stuttering

Fear as an Inhibition in the School.—Fear is such a universal and commonplace matter, and to many people the fears of childhood are so silly and grotesque that few realize the inhibitory influence of fear in school work. Probably every child, as already noted, brings into the school certain fears developed in the home, or the street, or else develops such fears in the school itself. Thus one of the first duties of the teacher who would have regard for the child's mental health is to discover and remove the fears of the pupils. Even when these fears are not acute and definitely conscious they may be unconscious to the individual and most serious in their inhibiting effect. This subtly disintegrating influence may occur in any subject of instruction. No better example of these inhibitions of fear in school work could be chosen perhaps than the psychoneurosis of stuttering.

It is now recognized that stuttering is not usually due to a local and organic defect but is likely to be the result

of general lack of motor control and lack of power of adjustment. It is not a simple but a complex matter.

In many cases the immediate condition of stuttering seems to be a mental inhibition. Fletcher's study gave interesting results in this respect.[18] And though in most cases the real cause may be, as Blanton maintains,[6] a general lack of ability to make adjustments to life, in some cases it may be no more than an unfortunate conditioned reflex due to accident or bad training.

The Presence of Fear.—Fletcher notes that when it becomes necessary for the stutterer to speak he is in a state of dread or fear. In a group of stutterers he found the average pulse rate, after being told that they would be asked to speak, was 90, two with a maximum of 120.

Boris Sidis considers a functional psychosis of this kind as being at bottom made up of psychopathic associated reflexes and fear reactions from experience in early life. A case of stammering is likely to be a case in point, and he describes at length a case of this kind where by allaying a patient's fear by general hygienic care and treatment, the physical condition improved, and the stammering and other symptoms disappeared.

Examples of inhibition are furnished by many of the more usual cases of this disorder. Here the fear of stuttering and the extreme effort to overcome the difficulties connected with certain sounds are themselves often the cause of the stuttering. The intrusion of consciousness or the fear inhibits the ability to speak the words directly and correctly.

Devices that Remove the Inhibition.—Any trick or device that enables one to get rid of the inhibiting fear is effective. For example, the stutterer speaks without difficulty when speaking in concert with others. Fletcher, in a study at Clark University, found that even two

stutterers speaking together in concert speak all right. The attitude of the stutterer when speaking or reading in concert seems to be that even if he stutters it will not be noticed, the reading will go on just the same, and hence his fear is removed; and apparently when two stutterers read together the attitude is the same so that each stutterer feels that both are not likely to have trouble at the same time and so the reading will proceed all right.

Fletcher reports concrete situations and devices that inhibit the inhibition:[18]

One of the writer's subjects (A. M.) said that he never had any trouble talking nonsense. Another subject (H. D.) reported that when called to the telephone he would frequently take the instrument in his hand, and while raising it to his mouth would keep saying "hello" without removing the receiver from its hook. The instant he took the receiver off and got into connection with the parties at the other end of the line, and realized a necessity to speak, he became powerless to say anything. Another stutterer reported that he could talk better to his mother than to any one else because she seemed to have the ability to anticipate what he meant to say and could relieve him, at various points, of the necessity of continuing to speak. H. A. reports that he is helped if his auditor seems indifferent to what he is saying. The stutterer is apt to get on well if he can avoid difficult sounds and words, and so long as he can substitute some other word instead of giving a definite form of expression. Thus the stutterer is apt to avoid clear-cut and definite statements and always to prefer more or less indefinite forms of expression which give him the opportunity to avoid all words and phrases that cause trouble.

H. D. states: "I stutter worse when a specific answer is needed, and when a person is looking at me to hear my answer; it is very hard for me to ask for a transfer upon any particular car line, such as Lincoln Street, Greendale, etc. Here a par-

ticular word must be spoken; there is no opportunity to substitute a word which I could pronounce more easily." Gutzmann, too, has noted that the stutterer finds greater difficulty when a choice of words is impossible. A. N. reports that he is less able to speak if he realizes that some one is watching him; the mere feeling of the presence of another person often renders him unable to speak.

It is usually easy for stutterers to talk to children or to animals. The thought that his observer is unacquainted with his difficulty is also helpful to the stutterer. Nearly all stutterers are able to speak or read without stuttering when alone. Many stutter in conversation but do not stutter in public speaking. The most helpless stutterer studied by the writer had during one summer a position as "spieler" for a side show at a summer resort. This position required him to stand in front of the tent and announce to the passers-by what was to be seen within. He filled this position with success. He stuttered violently in conversation; yet, whenever he was called upon in the laboratory to give his sideshow "spiel" he could do so without stuttering. Such expedients as changing their style of speaking, as imitating some one's peculiar form of speech, as getting away from their accustomed personality and playing a rôle usually make it possible for the severest stutterer to speak fluently and without difficulty.

Interference with the Automatic.—Such cases of stuttering furnish good illustrations of the inhibition from conscious interference with functions that should be unconscious. Thus speech, once acquired, is an automatic act performed more surely and more accurately the less consciousness interferes with its automatic processes. Again Fletcher gives good illustration:[18]

The difficulty encountered by the stutterer in the pronouncing of certain letters is determined, not by the nature of the letters themselves, but by the experiences associated in the stutterer's mind with the use of those letters. One of the subjects, W. N., acquired a persistent tendency to stutter in pro-

nouncing a particular word in consequence of one unsuccessful attempt to give a number while going through his regular test in counting from one to twenty. To instruct him to be on his guard as he came to that number seemed each time to furnish a positive suggestion to stutter.

As Tompkins also has noted, in such cases the memory of a failure has an inhibiting effect and causes further failure, and here methods of cure are often methods of increasing the difficulty.[58]

The teacher observes the patient, finds out what sounds he fears or asks him what sounds he fears and then drills him in the pronunciation of those sounds, thereby bringing them still more forcibly to mind and encouraging still more forcible effort to say them. Consequently still more abject failure.

It may give temporary relief but is injurious because it increases the fear.

Cure by Removing the Inhibition.—In all the usual cases it is fear of inability to speak, a sense of the difficulty of certain sounds, intense effort or the like on the part of the reader or speaker, that constitute the inhibition. Any method that removes the inhibition cures the trouble.

Swift, who has lectured and held clinics in many different cities, has developed a peculiar theory to the effect that the immediate cause of stammering is a loss or diminished power of visualization.[51] On the basis of his study Swift concluded that "when visualization is present, stuttering is absent, when visualization is absent stuttering is present."

A German writer, Hoepfner, also maintains that stuttering is due to an abnormality of mental imagery. His thesis, however, is that the stutterer's difficulty is tran-

sient auditory amnesia. The stutterer is of the auditory-motor imaginal type, but in attempting to speak he loses his auditory imagery.

This theory apparently represents a peculiar error of the kind liable to occur in this subject; for, as we have seen, anything whatever that distracts the attention of the subject may act as an inhibition of the stuttering. As Fletcher has pointed out, if the stutterer visualizes the objects he is talking about, it will furnish the same kind of distraction from his habitual mental state in speech as the various expedients mentioned, and so have the same effect on his speech for the time being, inhibiting the tendency to stutter. The same is true if he keeps his auditory imagery.

Although it may be true, however, that when visual images are present during the speaking, an individual does not stutter, that is because the presence of the visual images inhibits the fear, not because the lack of visualization is the cause of the stuttering.

Swift, on the basis of his theory, has devised what he calls a new method of curing stuttering which consists in developing the habit of visualization when one is speaking; and of his experience he says: "In relation to the stuttering the symptoms disappeared in proportion as the picturing processes developed." The method may be a good one; but his theory of it seems clearly erroneous.

Thus Fletcher concludes:

> To ignore this dread or fear, which is absent in the normal speaker and always present in the stutterer, and to attempt an explanation solely on the basis of the imaginal or ideational processes involved in speech is, to my mind, the fatal error into which both Hoepfner and Swift have fallen. They hold that the stutterer stutters because he loses his mental imagery,

whereas in fact he loses his mental imagery because of stuttering, or the morbid mental states that have their origin in the painful experiences of stuttering. It is the study of causes not of symptoms that will open the way to progress in the study of this problem as it did in the case of the study of hysteria.

Observation and a few studies by Fletcher indicate that there are no permanent peculiarities of imagery among stutterers different from those in normal persons;[19] and Fletcher thinks that the stutterer has a tendency to lose, not only visual, but all other kinds of imagery immediately before speaking, such images giving way to kinæsthetic sensations localized in the throat and vocal organs.

Two Methods for Removing the Inhibiting Conditions. —Thus in this whole matter of the prevention, cause, and treatment of stuttering, on the one hand, one should beware of hasty generalizations; and, on the other hand, one can recognize that, with proper individual treatment for the general lack of adjustment, two methods of cure are available, namely, what we have already mentioned as methods for removing the inhibiting associations and reflexes in general: (1) by suitable training which will remove the unfortunate inhibitions by establishing normal conditioned reflexes; and (2) by shock, that is, the employment of any distracting stimulus sufficiently strong to remove the inhibiting fear.

Just as in stuttering a number of words and sounds become objects of inhibitory fears, so in many other subjects such inhibitions are probably sometimes developed. Thus a number of psychologists have noted what they call a stammer of attention, and sometimes even a stammer in writing and other motor accomplishments.

The Handicap of Fear

Even without quantitative data the evidence is convincing that the development of injurious inhibitions during the period of home and school training is one of the most serious handicaps to efficiency and health. These persist and are often aggravated by the development of new inhibitions in the difficult situations of adult life. The injury from such conditions is not confined to the weakly endowed and the mentally disordered, but many who are deemed practically normal suffer from such inhibitions. Artisans, business and professional men in great numbers, eat their bread with sorrow, go to their daily tasks with fear, return at night with anxiety and distraction, and even in their sleep are haunted with inhibitions of which they are conscious or perhaps unaware. Worst of all, children in great numbers go to school in the morning to meet the inevitable failure of the day because of unsuitable tasks; whereas others who are superior go through the monotonous routine of a day filled with tasks and duties that are so easy that they do not appear worth while; so that between the failure of the dull children with a low level of intelligence and the lack of any significant success among the superior children with a high level of intelligence, for a great part of the pupils the school itself has come to mean a situation beset with inhibitions, and the result is the long list of failures and the great number of pupils that leave school prematurely.

The far-reaching result of the fact that any associated or conditioned stimulus may produce fear has been appreciated only by a few. No extended studies have been made. Psychiatrists, however, have plenty of illustrations of this indirect cause of fear. Locke years ago

noted this, and referred to cases like that of the brave man who turns pale at the sight of some particular person in a company and the fears of associated conditions that occur in unusual situations. The same is true of many of the most common situations in the schoolroom and in daily life. The speaker, the politician, the man of business, the man in society, all are the victims of chance companions and accidental conditions. The public speaker may be rattled by the presence in his audience of a critic, a cynic, or even a single indifferent and listless auditor. Children in school, as well known, are the victims of such chance associations, the rival in the class or on the playground, or a companion against whom one has a grievance, or any petty jealousy or aversion that transfers from one companion to another; all these and many others are cases in point. It is especially noteworthy, as has often been pointed out, that teachers who are nervous or hurried are apt to make nervous children; and it is no wonder that the hurried and nervous manner of a teacher, which in an animal trainer, would spoil the animal, but is supposed by many, apparently, to be of slight importance in the schoolroom, should favor the subtle fear reactions.

The Movement to Abolish Fear

Religion, though in primitive forms appealing largely to fear, in its most highly developed forms, like Christianity, has as its special aim to remove fear. The fundamental message of the Christian gospel is that love casteth out fear, and the aim of a million churches to-day is the elimination of fear. The aim of psychiatry is the same, and the work of thousands of sanitariums is to dispel the fears of their patients. The aim of mental hygiene is the acquisition of knowledge and the develop

ment of forms of activity, interests, and associations that will give the child sure protection against fear.

Why, it may naturally be asked, should not the school join with religion, psychiatry, and hygiene for the protection of children against fear? Of course, it will do this, as soon as teachers and schoolmen have an adequate knowledge of mental hygiene. Strangely enough, however, from ignorance of the prevalence of fear, of the fact that the occasions of fear are usually secondary and associated causes, and ignorance of the general teachings of mental hygiene, the school has been historically, in large measure, an institution where fears developed. Of course, to-day it is no such place as it was when Comenius referred to the schools as slaughterhouses of the young, and Erasmus said of the schoolmasters they were better fitted to be butchers and hangmen than to be teachers; but still to-day many children are afraid of the teacher's rod in discipline and the teacher's tongue in sarcasm; and instead of being homes for the development of wholesome activities and interests as defenses against fear, they are still too often, as Comenius said, places "where minds are fed on words."

Those readers whose mental activity is not inhibited by the critical attitude may be interested in the following fable: Adam and Eve in the Garden of Eden were not afraid. They reacted without restraint to their natural impulses. They adjusted normally to a natural environment. They were frankly and naïvely self-confident. Satan tempted them by suggesting that if they should ever think of the hippopotamus of failure they would be afraid. Thereafter, like all mankind subject to the imperative law of association, they could never rid themselves of worry. Thus fear, like death, came into the world with our first parents, and, unless removed

by mental training, shall last until the heavens be rolled away as a scroll.

Summary

We have taken fear as perhaps the best illustration of the inhibitions arising from the emotional reactions primary and secondary. Some of the most significant facts are the following:

1. The primary cause of fear seems to be violent change of stimulation. All the biologically adequate causes of fear found by Watson in his laboratory studies, loud noises, sudden removal of a child's support, etc., are cases of violent change of stimulation.

2. Anything whatever associated with a biologically adequate stimulus to fear becomes a conditioned or associated stimulus to fear. That such conditioned fears are actually produced has been demonstrated in the laboratory, and is illustrated in the experience of everybody.

3. The associated stimuli to fear are numerous and may be anything whatever.

4. Coördinated motor activity of any kind, physical or mental, is the universal preventive of fear.

5. The most effective remedy for fear is direct action, coördinated activity in relation to the object of fear.

6. In the mental field the most effective inhibition of fear is knowledge of facts that show the fear to be groundless.

7. Anything whatever may be associated with the mental conditioned stimuli to fear and act as an inhibition.

8. Fear in some form is a most common inhibition in the schools, and in any subject of instruction fear inhibitions may have serious effect.

9. Stuttering has been taken as an illustration of the

development of inhibitions in connection with learning a motor accomplishment, and the cure of stuttering illustrates the two-fold means that can be adopted in regard to fears in general: (1) the general improvement of the nervous and mental health; and (2) the removal of the fear inhibitions that cause stuttering by means of associated stimuli.

Problems and Questions

1. When you are afraid try the following experiment: first, anaylze the cause; second, associate some maxim with the experience; third, attempt some coördinated action in regard to the object of fear; fourth, do the thing you are afraid of. Note which plan succeeds best.
2. What evidence can you give that the inhibitions and fears developed in childhood are likely to be significant for the later life of the individual?
3. Report what impresses you most in your experience and observation of fear.
4. Can you report any cases of children or adults who are never inhibited in their action by fear?
5. What, so far as your observation goes, are the most common causes of fear in school children and teachers?
6. Give examples, if you can, of other unfortunate results of fear besides stuttering in the linguistic subjects of instruction.
7. Give examples of unfortunate inhibitions from fear in other subjects of school instruction.
8. Report cases you know where an individual has suffered, like Bunyan, from fear of performing a mental act.
9. What remedies for fear have you found most helpful in your own experience?
10. Give what evidence you can for the value of fear as a protective mechanism.
11. Give what evidence you can of the influence of fear as a cause of inhibition.

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CHAPTER XV

SUCCESS AND FAILURE AS CONDITIONS OF MENTAL HEALTH

Besides all these more concrete forms of inhibition, a general attitude of inhibition or a general feeling of incapacity and inefficiency is sometimes developed which inhibits activity in every direction. Every individual, perhaps, has had experience of this at some time or another, in conditions of great fatigue, in certain forms of chronic ill health, or in the depression of continued stress and strain. Something of this general inhibitory attitude seems to develop in case of some children and youth, especially at the beginning of school life, or perhaps at the period of puberty or adolescence, checking their work and making them apparently incapable of doing anything with zest and vigor and carrying any task through to successful completion. As soon as such an attitude is developed, the very consciousness of it itself acts as an inhibition. It brings a cloud over the whole school life of the child, is a form of scholastic dementia præcox, bringing upon the student the incapacity and feebleness of senility so far as school work is concerned, even before the development of maturity has been attained.

The Sense of Inferiority.—The most common form of this general condition of inhibition is characterized by a mental feeling of inferiority, a sense of *Minderwertigkeit,* which Adler has made familiar.[2] This is perhaps

common to all children at some period of development. Many children acquire the feeling that they are inferior to others and not capable of doing what others can do. This may come from physical defect or mental disorder or unfortunate training. Every psychiatrist knows how serious it may be and can give plenty of illustrations.

Adler has shown by many illustrations how usually this sense of inferiority develops. Naturally, if a child finds he is different in some respects from other children, especially if he finds that he is unable to do certain things that other children perform easily, he soon becomes especially conscious of this deficiency, thinks about it, worries over it, and finally, perhaps, exaggerates it until the mental inhibition that results becomes more serious than the physical defect itself. Much the same may be true of any mental defect as soon as a child becomes conscious of it.

The Adlerian concept of inferiority is rather complex and involved. The arguments used by him in special cases are sometimes fanciful and illogical; but a most significant truth is represented by the heart of his doctrine, that the feeling of inferiority founded on a defective organ is the fundamental element in the neurosis.

At the core of Adler's view, as pointed out by White, is the view that the inferiority of the organ consists, not merely in a lack of structural development, but quite as much in its childlike infantile inferior and undeveloped ways of function, that is, it has that capacity to function which is possible only at its stage of development; the skin, for example, which in the period of infancy is the avenue through which all sorts of comforting and pleasing sensations are transmitted to the baby, may remain inferior so that in the adult it may

continue as a source of organic pleasure out of all proportion to its properly balanced relation in the functions of the adult in their totality. Whether or not there is evidence for this, a similar explanation would seem to apply to all of the neuroses from his point of view.

The neurosis then consists in an effort by the individual to overcome this feeling of inferiority. The patient's effort to overcome this feeling, his attempt to flee from reality, lead him astray. As White puts it, "he spends his life in endeavouring to overcome the feeling of inferiority rather than in contact with reality. This is the fictitious goal of the neurotic."

Sometimes it is true this sense of inferiority may develop into something quite different. One conscious of deficiency in a certain respect is apt to try very hard to overcome it, to compensate for the defect or deficiency by greater care and careful training. In this way an overcompensation often results; and along the line of one's defect one may become especially skillful and even superior, and sometimes a general attitude of superiority may develop. In any case the result is apt to be a more-or-less unbalanced personality.

At a recent meeting of the National Education Association, Fernald, the pioneer expert in the training of the feeble-minded, expressed his belief that this sense of inferiority is one of the most serious factors in preventing normal activity in such retarded children. Naturally, they soon become conscious of their mental deficiency, and this consciousness becomes a serious handicap to normal behavior. Again, as in case of normal individuals, the need of compensation for their defects is felt, and in many cases becomes the cause of exaggerated and erratic behavior as a means of compensation. This, in the view of Fernald, accounts for

many of the crimes committed by the feeble-minded. The misdemeanor is merely an attempt to do something unusual and spectacular as a compensation for their inferiority.

Failure in School Work.—Another cause of this sense of inferiority calls for extended consideration. Apart from physical and mental defect, perhaps the most common cause is continued failure on account of unfortunate home and school conditions. In a sensitive child the resulting inhibitions may be serious. And when, as not infrequently happens, physical or mental defect, extreme sensitiveness, and experience of failure are all combined, the result may be disastrous.

Much complaint of the work of the schools is heard. Formal protest and appeal for reform are made by many educators. As Terman has said, "when instruction must be repeated, it means that the school as well as the pupil has failed." It is well to face the facts. The following at least are significant in relation to the mental health of the pupils.

Extended investigations have shown an appalling number of failures in our schools. On the basis of studies made some dozen years ago by Strayer in 319 cities, and other investigations since, he estimates that 25 per cent of all the children in the schools are retarded at least one year. The money cost of these repeaters is serious, but far worse is the loss in human values, because for many of these children this means failure day after day and week after week. Besides are the vast number of those who dawdle and slip by, never achieving any real success.

Francis P. O'Brien has made a study of high-school failures for a total of 6,141 pupils whose record was reported to him by more than 400 teachers in eight

schools in New York and New Jersey, and he has found the following significant results:[12]

Of the graduating pupils, 58.1 per cent fail one or more times.

Of the non-failing non-graduates 78 per cent are lost from school by the end of their first year. But the failing non-graduates have not lost such a percentage before the end of the third year.

The percentage of pupils failing increases for the first four semesters, and lowers but little for two more semesters. One-third to one-half of the pupils fail in each semester to seventh.

When we take into account that by the processes of selection and elimination only 30 to 40 per cent of the pupils who enter the elementary school ever reach high school, it is readily admitted that the high-school population is a selected group, of approximately 1 in 3. Then of this number we again select less than 1 in 3 to graduate. This gives a 1 in 9 selection, let us say, of the elementary school entrants. For relatively few general purposes in life may we expect to find so high a degree of selection. Yet in this 1 in 9 group (who graduate) the percentage of the failing pupils is as high as that of the non-failing ones, and the percentages of graduates does not drop even as the number of failures rise.

More recent investigations likewise show the great number of failures, especially in the first grade.

In England much complaint of the whole elementary system is heard.[17] Some writers maintain that, of the pupils who have had this training, comparatively few have mastered the mechanics of reading even simple matter; that the ability of the students to express themselves either verbally or in writing with any degree of correctness is deplorable; that in arithmetic much the same weakness is shown as in reading. Although others

defend the elementary schools, it is clear that failure is common.

Apparently, in all civilized countries, at least in England and America, a large percentage of the pupils have the continued experience of failure. To test the condition of our own schools it is merely necessary to ask the teachers one meets what part of their pupils are really distinctly successful in school work. The principal of a large private school, who has probably in a considerable degree a selected group of children, told me that in his estimate about 50 per cent of his children were successful in their work. A teacher in a public high school gave his estimate of those making a distinct success as about 10 per cent. Whatever the exact figures, both statistics and observation show that in the ordinary school the experience of failure is common and an enormous number of children are retarded.

The Psychology of Success.—Now this is not a mere matter of formal education; but success is one of the simple conditions of mental health, largely neglected, probably because it is so commonplace and so familiar to everybody. In the healthful development of the child and in the efficient activity of the mature individual, this, and to a limited extent, failure also, are health conditions of fundamental importance. Please note for a moment the psychology of it.

The stimulus of success affects the child in the cradle. The infant wrapped in his blanket, impelled by the fundamental impulse of activity; twists and wriggles and squirms, and when perchance he frees himself from the bands that fetter him, he exults in a debauch of motor activity. This is one of the great epochs in human development, when the child from his own activity achieves perhaps for the first time a marked success. If,

after the manner of the great cartoonist, Briggs, we try to imagine what the baby thinks about in his cradle, we may naturally suppose that whether in conscious thought, or more naturally in feeling, the baby here realizes the satisfaction which comes from an end accomplished. From this initial success all through the wonderful achievements of learning to walk, and to talk, and the various motor accomplishments of ordinary life, the same stimulus of success is continuously active; and without it in large measure, arrest of development would occur.

In its simplest terms success means the association of reality with a mental image. Take the case of a child opening and shutting a box. As perhaps everybody has observed, a child delights in doing a thing of this kind. Preyer's child opened and shut the lid of a can 79 times. Here the child has a mental image of the closing lid, and every time he shuts the box he gets the satisfaction of matching that mental image with reality; and it is such a delightful experience that he does it over and over again. This in its simplest terms is success. Later on we set up some end, either of serious work or of sport, some task to be accomplished; and when we accomplish it, we get success, whether it be in sending a tennis ball over a net or the result of a long series of events bringing about something of vital importance in our own careers.

The essential psychology of success is the same, whether we study the baby in his cradle, or the artist in his studio, namely, the matching of a mental image with reality. The mental state is often complicated by the zest of the activity, by feelings of power, and the like: but the essential psychological factor is this matching

of the image with reality, or, if you prefer, the objectification and realization of a mental aim or end.

It is a great day in the life of a boy or girl when the first conscious effort for a definite end is distinctly made. Many a person can recall the time when first it dawned upon consciousness that a definite success in a certain line of work was possible. Many of you can recall the day when you first realized that you really could do some school task, or the like, distinctly well. The stimulus of it made you work perhaps as you never had before.

From continued success through many years an attitude of confidence is developed. On this largely morale depends, and in many cases a single marked success goes far to produce it. This stimulus of success is an essential condition of normal development and mental health. Continued failure, on the other hand, is liable to develop an unsocial attitude, the shut-in personality, and to plant the seeds, perhaps, of mental disorder.

Causes of Failure in the School

Of course, we knew all this before; but in spite of that knowledge we have built up a system of schools and developed methods of teaching and discipline that ignore it and make failure inevitable.

The entrance upon school life is a great crisis in the child's life. It is as great an event for the child, perhaps, as entrance into the army is for the new recruit. It is often harder for the child than entrance upon camp life is for the soldier. The entrance upon school life represents the great mobilization of all the child-forces of the nation; and some of us are trying to show that it offers a great opportunity for hygiene, both physical and mental.

The child from infancy has been matching motor images with reality over and over again and achieving remarkable success in motor development, and has also been achieving social success in many ways; then he is put in an environment where success is doubtful, and many children, instead of achieving success, for quite a time experienee the humiliation of failure. For many children in the school there is little opportunity for success. Failure in certain lines of effort is desirable; but failure in everything is disastrous.

What are the immediate conditions and causes of this alarming percentage of failure in the schools? Some of them, overlapping and aggravating the inhibitions mentioned above, may be summarized briefly as follows:

1. *No Adequate Examination.*—Without examination all the children of the chronological age of six, the developed and the undeveloped, the sick and the well, the feeble-minded and the normal, the defective and the sound, are received into the school. As a result, the teachers are handicapped, many pupils are given work for which they are not fitted, either physically or mentally, and a large percentage of retardation and failure is insured from the outset. It is only common sense and practical efficiency, as well as sound hygiene, to make a thoroughgoing examination, physical and mental, of all children when they enter the school.[5]

2. *Overemphasis of the Subject.*—The devotion of teachers to the subjects they teach as the thing of prime importance often means the inevitable neglect of the object of instruction, the boys and girls to be taught. This tendency to consider first of all the subject and content of culture, and to put the object of culture in a secondary place is found everywhere. Cook puts this forcibly in the following passage:[6]

When will schoolmasters realize that, because of their iniquitous preoccupation with their "subjects," more than nine-tenths of the growth of a boy's experience is going on without any influence from them? When will they realize that a boy is somehow, or anyhow, adjusting himself with life quite apart from all their school-teaching? Because of their lack of sympathy and contact with a boy's real interests, he is all the time out of their reach. Let any schoolmaster honestly consider which boys he is influencing, and he will find them to be those whose interests he shares, those in whose confidence he is, and these will not necessarily be the boys who are any good in his "subject." . . . . A master's educational influence often has very little to do with the subject matter of this teaching, and sometimes none whatever.

To a large extent the conditions that so largely determine failure in the schools are beyond the control of the teachers. Not the teachers are to blame for the failures so much as our educational system. And yet some of the serious causes of failure, like that just mentioned, are directly under the control of the teachers.

3. *Overemphasis of Instruction.*—Perhaps the most common cause of failure in the schools is connected with the teacher's special function of giving instruction. The teacher's professional conscience is the cause of many failures. The good teacher can teach, and so it comes to pass that she often teaches too much, and the pupils have little opportunity to learn. The great and essential condition, if pupils are to have success—real success as the psychologist understands the word—is the opportunity for doing things, for tasks worth while, purposeful activity, self-activity of the highest kind. Without opportunity for this, pupils cannot succeed.

Effort is an essential condition of success; and if the teachers put forth the effort and the pupils are passive,

from a psychological point of view the teacher has all the success and the pupils fail.

4. *Antagonism between Pupils and Teachers.*—Certain professional habits of some teachers and the antagonism that results, account for many failures. The didactic habit, blame, the habit of "bawling out" pupils, develop an antagonistic attitude. Even without these it is hard to avoid a gap between teachers and pupils. It has always been so. The extreme disciplinarian—whether the mediæval schoolmaster whose efficiency for fifty years was recorded in a grand total of punishments: 911,500 canings, and 121,000 floggings, not to mention thousands of minor punishments; or the modern martinet who constantly blames and resorts to the subtle method of sarcasm, really a blow below the belt—all these aggravate this antagonism.

5. *Lack of Concrete Tasks.*—Another cause of failure in the schoolroom is the fact that many teachers do not give concrete tasks and clear instructions. The studies of the higher mental processes have shown that the mental attitudes are largely determined, not only by the tasks set, but by the instructions given. If teachers would train themselves to give clear and definite tasks and give their instructions so clearly that they will surely be understood, it would save many failures.

6. *Neglect of Types.*—Another cause of failure is our lack of adaptation to the different learning types. Some children learn easily by being told. Others learn with great difficulty by mere instruction, but have to do things themselves in order to learn. School work and school methods are usually adapted to the former class, those who learn by instruction. Those who learn by doing are usually handicapped, and in the ordinary school work are likely to prove failures. Such children

should be given opportunity to learn things in their own way by doing things themselves; and, in general, it would be wise if there were more training and less dependence upon mere instruction.

7. *Neglect of the Individual.*—Again, the school minimizes the opportunities for success by the large heterogeneous groups organized into classes. In a large class it is almost inevitable that the teacher should be handicapped and forced to give attention chiefly to the dull and delinquent pupils, or to those especially bright, or to divide attention in a loose and inefficient manner over the whole group in a futile attempt to do justice to all.

8. *Neglect of the Exceptional.*—The school does not differentiate properly for exceptional children. Unusual children, and, strangely enough, those that are specially bright, often prove failures in the school or are retarded. Terman has specially emphasized the fact that the bright are often retarded; and, as everybody knows, the children interested in doing rather than in books often prove failures.

Not long since I visited a famous school, and one of the teachers discussed with me the case of a boy who was unusual. He did not fit into the scholastic grooves and hence made an undue amount of trouble. The hope was expressed that he might outgrow his peculiarities; and the case of another pupil was cited who likewise had failed to drop into the lock-step, but who a year or two later was satisfactorily lost in the crowd and gave no further trouble. Thus, to the ordinary school a conventional failure is more desirable than a troublesome success.

9. *Neglect of the Defective.*—Most schools do not care properly for defective children. Among the pathetic tragedies of childhood are the cases of those who never

can achieve success because of defect—the child with defective vision who cannot see the blackboard, the deaf child who cannot hear the teacher, the child tormented with headache or toothache, the child whose brain nutrition is reduced by nasal obstructions, the sensitive child, the misunderstood child, and the whole list of nervous defectives.

10. *Prizes for the Best.*—The prevalent custom of offering prizes for the best work in different subjects, and the like, gives the opportunity for one or two to succeed, but all the rest must necessarily fail. It would be far better to offer a reward for all who succeed in reaching a certain standard of excellence. Just as in some of the best summer camps, instead of a prize for the best, every boy who can swim a certain distance, or do a certain amount of work, receives a badge of honor. Honest effort should be rewarded, whether a child stands first or last.

The method of marking usually adopted, the overemphasis upon the results of standard examinations together with the artificial ranking of pupils, are also the occasion of many failures. The modern method of adapting work to the mental age and ability, and requiring an accomplishment quotient of one instead of a certain percentage at a formal examination is far better.

11. *Mistakes at Home.*—A large class of school failures are due to unfortunate conditions at home, or the mistakes of parents, or to unfortunate attitudes the child has in some way acquired. The teachers are often unaware of the real cause of the trouble. The significance of such cases can be seen only by concrete illustrations. Most teachers can give examples. A single one representative of a large class may be given. It is contributed by a former student, Miss Richards:

Raymond D., 10 years old, intelligence quotient 135, but took twice the usual length of time to cover a unit in spelling, 50 per cent longer than the average for language, two and one-half times longer than the normal period for arithmetic. Lack of motive. Conduct fair, generally an onlooker on the playground, unable to get into the game. If nagged or scolded, would sulk and hold resentment. Otherwise obedient, bookish, impractical, sensitive.

The child was examined, told that he had done unusually well, that he could be the pacemaker of his class. He then cleared off his back work within a week or two and since then has progressed at twice the speed of the average child. Two or three slumps have occurred, but a little special interest and encouragement put him on his feet again. "This case would have been dismissed as one due to the teacher's neglect and lack of appreciation of his ability, had not an unusually good opportunity made us acquainted with his environment." The boy's father is dead; his mother, with the help of his sister, has a little store. The mother is a notorious nagger, emphasizes Raymond's shortcomings, is certain he will never amount to anything, hence the boy's feeling of inferiority which seems to have paralyzed ambition. Having brought about a more friendly attitude toward the teacher by judicious praise, the boy was stimulated, and the report adds: "At present the boy has a friendly attitude toward his teachers and is doing good work. He falls off occasionally when a new teacher, who does not know the situation, fails to provide the encouragement he needs. This boy's difficulties have been removed merely by providing the friendly interest and recognition which children usually enjoy from the parents."

12. *Confused Aims.*—A fundamental cause of failure is the fact that the aims of theoretical pedagogy are often vague and uncertain, and the vital significance of habits of health is not clearly seen and properly emphasized.

A former commissioner of education in Massachusetts has stated that there is no consensus among educators

in regard to the aim of elementary education, and frankly admits that he himself does not know what the aim is. From the point of view of theoretical pedagogy this surely indicates a praiseworthy open-mindedness, but from the point of view of practical education it is an amazing statement. To this, hygiene naturally answers that if pedagogy does not know the aim of elementary education, then pedagogy should give place to hygiene; for hygiene does know the aim and can state it definitely: in a word, the primary aim is the conservation of a child's health and the development of habits of healthful activity, physical and mental. Although it puts emphasis on letting a child alone and the importance of spontaneous development, on the other hand, it can describe clearly what habits of health should be acquired.

13. *The Fetish of Symmetrical Development.*—The fetish of symmetrical development causes many failures. A false pedagogy has exalted the value of an all-round symmetrical training and of the advantage of doing what children are not well fitted to do, and in which they are bound to fail. How common this practice is everybody knows. An account of what would seem to be the earliest historic attempt at this method of training will be sufficient for illustration. I quote the report from a reliable scientist, the late Professor Dolbear:[8]

In antediluvian times, while the animal kingdom was being differentiated into swimmers, climbers, runners, and fliers, there was a school for the development of the animals.

The theory of the school was that the best animals should be able to do one thing as well as another.

If an animal had short legs and good wings, attention should be devoted to running, so as to even up the qualities as far as possible.

So the duck was kept waddling instead of swimming. The pelican was kept wagging his short wings in the attempt to fly. The eagle was made to run, and allowed to fly only for recreation.

All this in the name of education. Nature was not to be trusted, for individuals should be symmetrically developed and similar, for their own welfare as well as for the welfare of the community.

The animals that would not submit to such training, but persisted in developing the best gifts they had, were dishonored and humiliated in many ways. They were stigmatized as being narrow-minded and specialists, and special difficulties were placed in their way when they attempted to ignore the theory of education recognized in the school.

No one was allowed to graduate from the school unless he could climb, swim, run, and fly at certain prescribed rates; so it happened that the time wasted by the duck in the attempt to run had so hindered him from swimming that his swimming muscles had atrophied, and so he was hardly able to swim at all; and in addition he had been scolded, punished, and ill-treated in many ways so as to make his life a burden. He left school humiliated, and the ornithorhynchus could beat him both running and swimming. Indeed, the latter was awarded a prize in two departments.

The eagle could make no headway in climbing to the top of a tree, and although he showed he could get there just the same, the performance was counted a demerit, since it had not been done in the prescribed way.

An abnormal eel with large pectoral fins proved he could run, swim, climb trees, and fly a little. He was made valedictorian.

From this prehistoric attempt at ideal education down to the present many schools have put a premium upon failure. And from this continued effort to do work that cannot be done well, pupils are apt to acquire a slovenly attitude, and like the young horse, given too heavy a

load at first, they acquire the habit of lying down under a difficult task.

What can be more depressing than continuous failure in whatever one undertakes. As our classes are now arranged and school work ordered, it often happens that month after month many children have no legitimate opportunity to succeed. If a chance to leave school offers, naturally they take it.

14. *Overemphasis of the Machine.*—The scholastic machine is often responsible for the failure of the pupil. The problem of the teacher, especially the problem of the principal of a school or a superintendent, is, from the point of view of mental hygiene and sound education, one of almost appalling perplexity. The problem of conserving the mental health and promoting normal healthful development in a single individual child is a difficult one. When the problem concerns 50 children or 500 children or 50,000 children, it is vastly more difficult. The executive, whether the individual teacher or the superintendent, must of necessity form an efficient school organization. He is forced to establish a scholastic machine. This is done in order to improve the conditions of the pupils themselves. It is for the sake of the child. It is indispensable.

By a subtle characteristic of human nature, as a result of the very law of association itself, it usually comes to pass that the organization, the scholastic machine, claims attention unduly, and soon the boy and girl for whom the machinery was made are neglected. It is the factory tendency of all big business. The most subtle form of this, perhaps, is where standard scales and the scholastic product are recognized as the essential thing and the mental processes involved are neglected. Thus it comes to pass that standardized results are liable to be pur-

chased at the expense of a considerable number of failures.

President Eliot has called this the blight of modern education under the name of standardization. Right standards in school work stimulate the pupils, help the teachers, and tend to vitalize the training. They mean efficiency, a superior scholastic product, school tests that permit of comparison with the work of other schools, and an example of the results of superior teaching; but an insidious danger seems inevitably connected with the aim of standardization. Soon the emphasis seems to be placed on the scholastic product rather than mental growth. The great aim is to make the maximum number of pupils conform to the standards, the opportunity for initiative and variety of accomplishment is minimized, and the interest of the pupils dulled. In a word, the trouble is, as Whiting has said, we desire standardized results in an unstandardized world.

15. *Social Failure.*—Most tragic to the child are the failures to win social success. The chief cause is the lack of properly organized social groups and wise leaders.

With the growing insight that for education and hygiene alike group training is necessary, in some schools and in many camps for boys and girls it is recognized that social groups should have leaders and that such leaders should adopt the method of suggestion and personal example. This is excellent; but for mental hygiene much more than this is necessary. As already pointed out, the leader who dominates the group is apt to rob the other children of their task. What is needed is the leader that can integrate the abilities of the group and give each child the opportunity for success.

Extrascholastic Conditions of Failure.—Such are some of the conditions that produce failure in the public schools. These, for the most part, are conditions within the school itself. What may be called the extrascholastic conditions of failure need not be discussed here. Consideration of them would involve study of the whole subject of school economy and school organization. Among the general conditions in society to-day many tend to aggravate the conditions of failure within the school. Especially serious among these are little intelligent preparation of children for school work by the parents, and lack of coöperation between the home and the school; waste of public money, often due to lack of business methods and of common-sense business prevision in the administration of school affairs; failure, for example, to see that a greater expenditure in the school plant which reduces overhead expenses is always economy for a city, and, on the other hand, failure of the public which fails to see that unhygienic conditions, which mean disease and retardation, are really wasteful methods and that conditions that insure health and success in school work are the best possible expenditure; and, most serious of all, perhaps, in many localities, the shortsighted clamor of the community for reduction in school costs. These extrascholastic conditions are another story that cannot be told here, but they represent the wider conditions that aggravate the conditions of failure within the school itself.

Other factors are easily distinguished as conditions of school failure—large classes, improper methods of discipline, failure of teachers to get into contact with the pupils, ill health, etc. From one point of view, it is failure to adapt instruction and discipline to the individual; from another point of view, the giving of in-

struction instead of training; from still another, the development of unfortunate inhibitions. In all cases, it is directly or indirectly some means of robbing the pupil of the opportunity to do a task worth while.

Conditions of Success

The Teacher and Success.—Much depends upon what the teacher says to the pupils. Still more important is the teacher's own faith in pupils' ability to do the work. If the teachers believe the children capable of accomplishing a great deal, the children are likely to believe in themselves and to put forth great effort. One's confidence comes most of all, however, not from what the teachers may say, but rather from the pupils having actually done things. The memory of past successes develops the belief in one's power to do something. It is success that nerves the will to effort, whether of Napoleon's soldiers crossing the Alps and on the battlefields of Italy, or the children in the primary grades wrestling with the first simple problems in arithmetic. Of course, the harder the task accomplished, the greater the effort, and the greater the stimulus from success for other tasks. But the maxim for the teacher should be to make the work so easy at first that the child will believe that he can do it, and success will be assured.

Perhaps the most common fault among teachers is to make the task too difficult for children in the lower grades, and at the beginning of new subjects, in the higher grades. Much may be learned here from the training of athletes. The athletic trainer always begins with easy and simple exercises, and little by little increases their difficulty until the learner is able to accomplish great and difficult feats. If the work in school is not made too difficult for the brighter pupils, it is made

too difficult for many individuals in the class. They may pore over their books, but they never make any great effort because they never have any great successes that really make themselves believe they are capable of doing something. When teachers are frank, they are apt to say that the indolence and stupidity of their children is the reason they do not succeed. It is equally true and specially important for teachers to remember that their pupils' lack of success is the cause of their indolence and stupidity. Thus, later on, the teacher's maxim should be to make the task so difficult that it will seem worth while.

Illustrations of Success.—A single concrete case may be given, and, I believe, every successful teacher of long experience can furnish similar illustrations. In a preparatory school, a teacher found a boy in his geometry class who could do no work at all, and moreover, he seemed to be lacking in sense and was the butt of the jokes of the other boys. This teacher urged the boy to leave the class and to take up elementary geometry again. The boy did so, and in this simpler work he succeeded so well with some assistance, that when he finished the teacher was obliged to give him 100 per cent. The stimulus of this success made the boy believe that he could do something; he made effort in other subjects and improved so remarkably that when he graduated he was one of the first of his class. If a child has a noteworthy success in one subject, he often becomes a different person, and the same is true of a class.

If a child believes that he can do a thing he is likely to attempt it; and, if he begins, the amount of effort put forth depends largely on his belief in the power to succeed. Meumann has noted this in the learning of nonsense syllables. Here the confidence in one's ability to

succeed is a significant factor in determining the accomplishment. Meumann reports that he has observed this in experiments with children in the psychological laboratory.[11] If a definite experimental task, for example, the learning of a series of twelve nonsense syllables, is allotted to a school child, and during the learning it acquires the conviction that the task cannot be mastered, the number of repetitions required for learning the nonsense syllables is enormously increased, and, in general, no definite learning occurs. On the other hand, if the same child succeeds in mastering the task, if it gets the conviction that its ability is equal to the allotted task, from that moment on the number of repetitions required decreases, and an increasingly perfect learning results. Meumann noted particularly the effect of this inhibition of the will in experiments on immediate retention both in children and adults.

When the subject was able to repeat seven words without error after once hearing them, with eight words a radical falling off suddenly occurred, or perhaps one would be unable to give more than one or two words. But with nine words one was able again to retain them. This is explained by the fact that in case of eight words the feeling suddenly comes to the subject that the series is too long. Attention is inhibited in the case of a definite word, the seventh or the eighth, and the subject forgets all or nearly all which he had learned before with favorable conditions of attention. The inhibition, therefore, is retroactive. It disturbs even the normally retained impressions.

Similar illustrations are furnished by the everyday work of the school. Everybody knows how easily children are discouraged. The following incident is a

typical illustration of what may be accomplished if the children are made to believe they can do something. In the examination in arithmetic in one of our western cities some years ago, the pupils were given several problems of a kind different from those they had already had in their work. In all the classes in the city except one the children noticed that the examples were unfamiliar, and sat back unable to do anything with them. In one school, however, the pupils, like the rest, noted the unusual problems, but their teacher said that if their training was good for anything it would prepare them to do new things, so they ought to be able to do the examples even if they had never had the same ones before. Thereupon they made an effort, and three or four of them, the only ones in the city, succeeded in solving the problems correctly.

The Genetic Point of View.—In attempting to give the opportunity for success one should take the genetic point of view. Young children are interested in activity for its own sake. The young child is delighted simply to pound a block with a hammer, and every blow spells success. The older child is not satisfied with the mere expenditure of energy but wishes to accomplish some higher end. To the adult mere expenditure of energy in infantile activities is the height of boredom. Bardeen cites the case of one of the older educators who hired a man and set him to work in his yard at striking a log with the back of an ax, paying him the usual wages. Before noon the man came in and threw up the job, said he couldn't work any longer, that he had to see the chips fly. Thus it is with children. Whereas feeble-minded and young children must be given very simple and easy tasks in order that they may get the stimulus

of success, for older children it is necessary to give tasks hard enough to appear worth while if success is to be achieved; and, as children develop mentally, higher and more difficult ends must be presented if real success is to be obtained.

Barker has well stated the care that should be taken in regard to children liable to be handicapped. Ordinarily the rule should be, as he has expressed it, that a child should never by the task given, or by competition with normal children, be made to feel inferior. He says:[3]

> A child should never be made to feel inferior, for a feeling of inferiority may do a vast deal of harm. Even if a child be subnormal, it is important to try to protect it from feelings of inferiority. Thus, if possible, a subnormal child should be kept from coming into conscious competition with normal children. When a physical defect of any kind is present, for example, a residual shortening of a leg from poliomyelitis, a facial paralysis or a spinal curvature, an effort to convince the child of the possibility of counterbalancing advantages should be made (pp. 251-252).

Success and Worry.—Again, application of the psychology of success takes the sting out of worry; worry may even become a condition of success, and when we face our worries and analyze them, that very activity may destroy the worry itself. Avoid worry if you can; and the knowledge of the serious physiological effects of worry helps one to avoid it, but it is futile to tell a child or an adult not to worry. One can, however, point out the things that can be done in a difficult situation; and the mature individual can face worry, analyze it, and mentally make worry itself an occasion of success. It is chronic worry that kills and not the brief and in-

tense worry that soon ends in the "grand and glorious feeling" of success.

When we continuously fail in our attempts to match our mental images with reality, confusion of the mental images arises, or, in other words, chronic worry begins; and none perhaps are more prone to this than teachers and social workers. Their ideal is perfection. Naturally, the great gulf between their ideals and their performance worries them.

Here the rule for every one, child or adult, is the same. Each individual must work out this problem for himself, but the teachings of mental hygiene are helpful to every one.

The Heroes of Defeat.—Of course, in a world like this where failure is common and every day brings its disappointments as well as its successes, it may naturally be asked if mental hygiene has no words of encouragement for those who are defeated. The answer is that hygiene does have a message definite and positive for those who experience failure more than success. The help comes in the insight that, after all, the doing itself is the significant thing, that the fun is in the fight, and that the battle of life is worth making for its own sake. When one can make his goal effective doing without special regard to success or failure, then the doing itself from a psychological point of view becomes success; and thus we find strong men everywhere fighting losing battles, and the heroes of defeat are no less sane and healthful mentally than those who succeed as the world counts success. We find such men as President Harper on the one hand, who, stricken with an incurable disease, kept up his work to the last, and men like Jack London at the other extreme, who felt that even the

gamble of life was worth while for its own sake. Thus he sings:

> This out of all will remain
> We have lived and have tossed.
> So much of the game will be gain,
> Though the gold of the dice has been lost.

Evil as this world is, it is nevertheless true that the doing, an active attitude toward difficulty, often justifies itself.

Keeping in mind the psychology of success, we see that anything whatever, from the psychological point of view, may be the occasion of success or failure. Since, in its simplest terms, success consists in matching a mental image with reality, it is obvious that this may be done legitimately and healthfully or illegitimately and pathologically.

The Pathology of Success.—The pathology of success is really a very large subject. It concerns, not merely the overstimulation that comes from continued success without normal relaxation, but the extreme self-consciousness of success that occurs often in the case of bright children of unstable nervous organization where it develops into ego complexes, and finally, perhaps, into megalomania. The pathological tendencies are seen also in very different and very simple and commonplace manifestations.

Some people never can think of doing a thing and be satisfied without doing it. If they think of saying a thing they must say it regardless of consequences. If one of a group refers to a familiar quotation, they must repeat the quotation in full. If they start to do a thing, they must finish it. If they see merely a pin on the floor, or a piece of paper, that suggests the image of

taking it up, and however pressing their work may be, this mental image must be matched by reality, and before anything else they stop and pick up the paper and pin, or what not. Everybody knows how, if one thinks of some trivial act like shutting the door or putting a chair in its proper place, one never feels quite satisfied until the thing is done. Some people in trying to recall a forgotten word are in continuous misery until they can remember it. Whatever it is, the mental image of the performance must be matched with reality and the satisfaction of success obtained. Of course, such lower habits of success may interfere with the development of higher ones.

Illustrations of more extreme pathological cases might be given. Examples occur frequently in case of any slight irritation or eruption on the skin. Harriman has studied some of the more serious cases.[9] They are disagreeable in character, but one or two examples should be cited because they show clearly what happens in thousands of similar cases less extreme in form.

A case of this type was that of a business man about forty-five years of age who had excavated and excoriated his face for years because of some "germ" which he was continually impelled to eradicate. His face was badly scarred from the process. He frankly admitted that he could not control his inclination to abuse his skin. He was intelligent, and therefore the subject was gone over with him. He agreed that the cause existed in his mind, but questioned his ability to overcome the habit.

The common "fixed idea" in this connection is that there is some indefinite sort of germ or worm in the skin which must be removed. The patient tells you he finds a little lump in the skin under which he knows there is a worm. He digs at the spot with his nails, excoriating the upper layers of the skin until he finally extracts a bit of tissue. Oftentimes one

such operation does not fully relieve the mind of the patient and he then repeats it. Finally the spot is allowed to heal, and, owing to actual tissue loss, it heals leaving a scar. This process repeated a sufficient number of times will scar a face badly, but the scarred skin is, to the patient, only a battle-field upon which signal victories have been won. (p. 40.)

The Impulse to Complete an Act.—Special care should be taken to prevent children from developing such habits. Every one knows how common they are, and so-called nervous children, perhaps specially those who are handicapped by a sense of inferiority, are liable to develop the attitude of being bound to complete any act they have once undertaken. If, for example, these habits of picking the skin, biting the fingernails and the like, are formed, then the performance of these little acts becomes in itself a question of success or failure; and so the habit may become extreme as in the pathological cases mentioned. The best means of prevention would seem to be to give children plenty of opportunity for legitimate success, and to prevent, if possible, the beginnings of such systems of conditioned reflexes.

The Antitoxin of Failure.—Most tragic of all, perhaps, is the fact that the stimulus of success is intoxicating, and is likely to make one heady. Hence is needed the antitoxin of failure. In the early stages this is a valuable remedy for the ego complex and a preventive perhaps of many cases of megalomania. Especially is this indicated at that stage of adolescent development when even the normal youth is likely to know it all; but this is an antitoxin that should not be given in too large doses.

I have not time, however, to speak of the stimulus of failure, nor of the moral aspects of success, nor of the physiological conditions of success and failure. Metab-

olism is clearly affected. Probably the glands with internal secretion are involved. Success is sthenic, perhaps, increasing the flow of adrenalin, as a wholesome stimulus to function and a prophylactic to fatigue, toning up the whole system. Failure, on the other hand, is inhibitory and depresses function, and the inhibition of the will likely to result, unless one fights against it, may irradiate and depress all the activities, especially in the case of children.

Success as a Stimulus.—The need of success as a wholesome stimulus is universal. Children have an enormous appetite for it. They need large doses. Adults become depressed without it. It is vital for the normal. The diseased are often cured by it. The modern method in the best hospitals of giving the patient as far as possible interesting work, something worth while to do, has demonstrated its value for health. It is the gravest error for physicians, social workers, and teachers not to employ this wholesome stimulus.

The teacher's business is to see to it that every child at some time, in some way, in some subject, achieves a marked success, and that sometimes they get an honest gauge of themselves by failure. In like manner, the task for the physician in large part is to give the patient the opportunity to do something that seems worth while, a definite concrete task to perform, either in caring for his own health, or in doing something that indirectly will be a benefit to health. The business of the social worker also in large part is to give concrete tasks to those who are chronic failures, to give the opportunity for success so that the stimulus of success may be a help to further activities.

For those who have to deal with social failures, with the people who are down and on the verge of being out,

the problem is much like that of the teacher and physician; it is the problem of giving each case something to do that is worth while, and of placing each individual in a situation where success is likely to occur; and, when we recall the essential psychology of success, we find that this is possible in many forms of work, and that the psychological success in doing ordinary work properly, in itself is a stimulus to further work, and often the most important condition of mental health. In this sense every worker can give himself the benefit of this wonderful tonic.

The Danger of Failure.—The failures of the school are the candidates for mental disorder. The evil is so familiar that its significance has largely been slighted. Recently, however, the seriousness of failure in its influence on the mental health of children has been emphasized. A little analysis of the mental condition that results from continued failure is possible.

Every adult knows to a greater or less extent the humiliation and chagrin of failure. Most persons are able to meet its disintegrating effect by the experience or memory of a long series of successes and an attitude of confidence that the next time, or ultimately, one will succeed, however serious the failure of the present. In case of children, however, the disintegrating effect is liable to be more serious. The tragedy of retardation and failure in the schools would make an appalling chapter in the history of practical education and the literature of mental hygiene.

Defense Mechanisms.—As soon as a child has a continued experience of failure in school work, or even a single experience of extreme failure, at once the child either gives up in despair, or, what is more common, attempts to develop some defensive mechanism. The

most common and general defense is to put the blame on some one else. The lessons were too hard, the examination unfair, their teacher unjust, or perhaps the father or some member of the family, or even some companion, may have "queered" the pupil so that he could not succeed, or some one was to blame. It is the American method of "passing the buck."

Another defense, although not as common as that of placing the responsibility on others, is physical defect or illness. Placed in an intolerable situation, with no good chance for casting the responsibility on some one else, the child is forced to resort to some physical disorder, a toothache or headache or indigestion, or, in some cases, even a neurosis. Some defense or other of this kind is necessary to defend the personality and save the individual from the disintegration that inevitably results from failure.

The Real Preventive.—Nothing, perhaps, is so serious a defect in the schools to-day as this continued and widespread prevalence of failure. The usual methods adopted by teachers, notes to parents, low-mark warnings, and the like, are often ineffectual; often worse than this, they accentuate the disintegration of the personality. The real preventive, as we have seen, is a suitable task that gives the opportunity for success, and the remedy for a child who has suffered continuously from such a disintegrating influence is to give the opportunity for the stimulus of a marked success.

Defense Mechanisms of Teachers.—Failure, of course, is discouraging to the teacher as well as to the pupil, and teachers have as many defense mechanisms, perhaps, as the children. Among the more common of these are the contentions that the children are stupid or feeble-minded, that they have not been properly taught in the

lower grades, that the parents have spoiled the children, that they are engaged in too many outside occupations, that they are not properly graded, that the classes are too large, that the children are lazy, and so on. All of these are likely to be true enough, but as defense mechanisms it is interesting to study them.

One of the most common of these defense mechanisms is that the children are lazy. Recently a teacher expressed his opinion that 90 per cent of the failures at examination are due to laziness. This may be true enough, but it doesn't help us much. All normal children, at least at certain periods, are lazy, and so we might almost call laziness one of the characteristics of normality; hence it helps us but little to say that failure is due to laziness. The task of the teacher is to give opportunity for success in spite of a normal condition of laziness. The concept of laziness, however, is a beautiful example of a general abstract term that serves as a defense mechanism for the teacher.

If one makes a study of laziness, as Wile,[16] for example, has done, one finds that this is merely a blanket term for a great many things, or, in other words, there are many causes for laziness. In the South a special cause is the hookworm disease; in the North it is not infrequently malnutrition; in all sections of the country it is frequently the normal result of many different mental causes, not the least of which is failure. Commonly enough, we have the usual vicious circle. Laziness causes failure, then failure causes laziness; and it is only by studying each concrete case more thoroughly that one can find the real causes of failure.

This is a specially good illustration of the general conceptions to which we appeal so much in education. First, laziness is a blanket term, and in reference to

school success or failure may mean any one of a score of things. In the second place, failure itself is the cause of a large part of the so-called laziness of school children; or, in other words, laziness is quite as often the result as it is the cause of school failure. Third, teachers as well as pupils have their defense mechanism for failure; and laziness, which served our fathers well, no longer is a good defense because to-day we see what it means and what it does not mean.

The Teachings of Hygiene Simple.—This is merely one of the simple doctrines of hygiene often ignored. Perhaps it is not strange that many of the graduates of our schools have to be reëducated in hospital or sanitariums. It is amazing how many adults would profit by such reëducation. We find men and women in the sixth decade of life that have not acquired the habits of health that should have been formed in the first.

Now all this is very simple, so commonplace that some cannot see its significance; but each of you can recall what a stimulus to effort success was in your own childhood; you know how the success of yesterday still warms your heart. The fact that you can do well certain things that are worth while gives zest to your life. You know cases where marked success in something or other has irradiated and affected the whole life of a child, stimulating his will and ambition. You know cases of those in financial or domestic or social crises on the verge of nervous or mental breakdown where a marked success has been their redemption.

Thus, on such simple things, to the ordinary person simple, to the psychologist often complex, our mental health depends. By such simple conditions our habits, our association complexes, our characters are developed.

On such simple conditions sanity and insanity depend. Of such simple things mental hygiene consists.

Summary

1. One cause of inhibition in children requires special consideration, namely, what Adler has called a feeling of inferiority.

2. This feeling of inferiority usually takes its beginning from some physical or mental defect and the inability to do what ordinary children are able to do.

3. This feeling is apt to develop into a neurosis, and the patient, as White puts it, "spends his life in endeavoring to overcome the feeling of inferiority."

4. Sometimes this feeling of inferiority develops into something very different. The individual attempts to compensate for his weakness, and sometimes there is an overcompensation, so that he becomes specially capable along the line of his defect.

5. Another cause of the feeling of inferiority may be distinguished. It sometimes results from failure. In any case probably it is enhanced by failure.

6. A definite success, physical or mental, is apt to do much toward removing the sense of inferiority.

7. Every one, except those whose sense of inferiority has been compensated for and have developed a conceit neurosis or the like, needs the stimulus of success; and continued failure may develop an incipient neurosis in children who seem normal.

8. The causes of failure, both in the home and the school, are manifold.

9. Some of the more common causes of failure in the school have been distinguished. Some of them are due to the faults and lack of training in teachers; some are

due to wrong methods and improper arrangement of school work; some are due to the conditions of the school system and the educational machinery.

10. School failures are so common, and the need of the stimulus of success so universal, that every teacher should attempt to give each child in some way the stimulus of a marked success.

11. The rather common forms of what may be called pathological success should be avoided by proper training and the giving of opportunity for legitimate success.

12. From the psychological point of view the doing of a significant task of any kind, whether reward comes or not, constitutes success. All teachers, social workers, and physicians, must utilize the stimulus of success in order to get satisfactory results.

13. Failure, under suitable conditions, is significant also; but continued failure is apt to develop an unsocial attitude and make one a candidate for mental disorder.

Problems and Questions

1. What seems to you to be the essential element in the psychology of success?
2. What beneficial results of success have you observed in children or adults?
3. What injurious results of success have you observed?
4. What injurious results of failure have you observed, especially in children?
5. Describe other conditions of failure besides those mentioned in the text.
6. What are some of the conditions and methods that tend to prevent failure in school work?
7. For pupils who suffer from a sense of inferiority, what treatment would you deem best?

8. Can you report cases where a sense of inferiority has seemed to be the cause of misconduct?
9. From a psychological point of view, in case of "heroes of defeat," such as those described in Armstrong's book of that title, was the stimulus of success really lacking?
10. Describe from your own observation examples of a pathological striving for success.
11. Describe if you can a social group in which it is relatively easy for each member of the group to achieve social success.
12. What methods and devices can be employed by teachers for insuring success to a maximum number of pupils in a school class?

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CHAPTER XVI

ORDERLY ASSOCIATION AS A CONDITION OF MENTAL HEALTH

THE significance of the law of association in mental hygiene as well as in education has been shown in preceding chapters. It remains to illustrate means of training in orderly association in connection with the regular work of the school.

Interference of Association

From the point of view of mental hygiene the chief aim of education may be said to be the development of right habits of association; and the avoidance of interference of association is, perhaps, the most general negative rule in mental hygiene. What is signified by this can be shown best by illustration. We find interference of association in an infinite number of forms from the conflict of simultaneous stimuli in the nervous system and the relatively simple interference of incipient motor habits up to the confusion of thought in the individual who is worried or rattled or the patient who suffers from the insanity of doubt. It is illustrated in the most ordinary experiences of daily life as well as in experiment. A few concrete examples may be helpful.

Experimental Studies.—In many forms of experiment in the laboratory we have simple illustrations of interference of association. Bergström found it in sorting cards, where in the first half of the experiments the cards

were sorted into ten piles located in a certain way, and in the second half into piles differently located.[8] Bair in experiments with the typewriter and in sorting cards, noticed the same, although his results led him to conclude that there is less interference than Bergström found; but he also found evidence that "diverse associations become automatic with practice and that the neural disposition of the old habit does not vanish when a new one is formed."[2] Müller and Pilzecker found that when a series of nonsense syllables has been learned, a later test shows that less is retained in case a task demanding concentration—the careful consideration of pictures, for example—be given the observer immediately after the learning.[21] Culler in more recent experiments with the typewriter and in repeating Bergström's experiments, found that "interference is an incident in the course of automatization of the two opposing associations."[8] Interference is found also, incidentally, in many laboratory investigations, and it is illustrated in learning typewriting, stenography, and the like. It is likely to occur anywhere during the processes of learning before the series of associations is thoroughly organized. And Roback's study gives telling examples of the interference of will impulses.[26]

Laboratory experiments on the acquisition of skill furnish innumerable illustrations of the law of interference of association; and investigations by the so-called *diagnostische Assoziations-methode* give noteworthy examples.[18] Specially significant is the fact that if the associations have a distinctly affective character, interference is likely to result. The normal association reaction time is from 1½ to 2 seconds, but where the associations arouse distinct feelings, the reaction time may be 6 or 8 or 10 seconds. If, for example, the associations con-

cerned relate to the affairs of one's own family, especially if there be domestic friction or the like, or if a crime has been committed, or if for any reason strong feeling be involved, the association reaction time is likely to be enormously lengthened. Thus, some have rather hastily inferred that the association method can be used in the courtroom to determine the guilt or innocence of a prisoner on trial. The reason for this lengthened association reaction time is the strong feeling aroused, at least, in many cases. But, on the other hand, there may be a lengthened reaction time for many other reasons, and anything, in fact, that causes interference of association is likely to lengthen the reaction.

Such experimental results show in the most emphatic manner, in the first place, the great waste of time when interference of association occurs, and from a hygienic point of view the great stress and strain likely to be involved in the mental processes wherever interference occurs; even when a minimum of feeling is involved, the mental process is allied to the arch enemy of the mental health, namely, worry.

Perhaps the most important point hygienically is the relation of interference of association to feeling. Whenever attention to two things is demanded, one of which is strongly affective in character, interference is sure to occur. And whereas feeling causes interference of association, interference, on the other hand, is the beginning, and a condition, of feeling.

Obsessions.—Interference of association is most vividly illustrated by numerous pathological cases. In extreme instances the patient seems to be always thinking of two different things at once, and clear-cut reactions are impossible. The so-called imperative ideas are often so many cases in point. The various phobias, pyro-

phobia, fear of fire, mysophobia, fear of dirt, claustrophobia, fear of closed places, and the like, furnish examples. The extreme form of interference of association and worry is well illustrated by the so-called obsessions. These occur in great variety from obsessions in regard to one's physical health or one's soul's salvation to the slight temporary obsessions where a nonsense rhyme or an absurd image persists in consciousness.

Every association of ideas is to a certain degree imperative. In a certain number of cases, if we have once seen or heard the irrelevant, interference of association is inevitable; in all cases it is possible. If our minds have once wandered to the unessential, such ideas are always liable to come up to our confusion. This is the tragedy of education. Inaccuracy in learning, the mistakes of a poor teacher, the results of a slipshod method, can hardly be atoned for. If a child associates a wrong pronunciation with a word, or makes an erroneous association in arithmetic or falls into error in grammar, the wrong association is almost sure to be remembered and causes confusion even if actual error does not result. The pupil cannot escape from it. He may know what is right, but the erroneous associations come to mind first and cause interference.

Many normal people are never straightforward in their processes of thought. They are always thinking of two things at once; or, if one subject holds the focus of attention, other things are in the background or indirect field of consciousness and likely always to interfere and cause distraction. All of us at times have this experience. Waiting for an important engagement, a forgotten duty, uncertainty about a verdict, unfaithfulness to an ideal, and the like, are occasions for it; and every individual in the stress of circumstance from

the collapsing financier to the rattled baseball player furnishes illustration.

Illustrations from Athletics.—Even in our recreations and athletic sports interference of association is likely to be the most serious menace to success. Of drop kicking in football, Brickley, the Harvard football player, says: *

> The "concentration" part of it comes when you are receiving the ball from the center. Then the least fumble or juggle is pretty sure to kill the kick. If while you are waiting for the ball to come back you happen to see something go wrong in the line or get the feeling that your protectors in the backfield are not in just the right places, there's a big temptation to let your mind wander from the business at hand. Even after the pass has started, these things seem to flash across your mind. If you let them jar you or if you let any sort of an interruption "get you," you're a goner. Nine times out of ten the kick goes wrong.
>
> A great many times you will get a kick away thinking of nothing else than that some one of the opposing linemen must have been offside or else he could not have broken through so swiftly. If you let it worry you, the kick is sure to go bad. As a matter of fact, if you had your eye on the ball you didn't see it at all. You "sensed" it. Anyway, drop kicking depends, to my way of thinking, upon keeping your eye and your mind on the ball from the moment you have taken your position and sized up the angle and the distance.

Pathological Examples.—The law of contrary association formulated by de Sanctis has a wide application. The extreme cases of interference of association, as seen in certain forms of nervous disorder, are perhaps cases in point. Neurasthenics sometimes complain that they see the opposite word to that desired, and the impulse to

* *Boston Sunday Herald*, November 17, 1912.

blasphemy and the like in cases of religious neurotics is also noteworthy. Weir Mitchell has also reported cases of this kind, among them the following:[20]

A naval officer after a period of unusual strain during the war of the Rebellion found that when on the landing of the staircase intending to go up the next flight, instead of doing so, he found himself going down the flight he had just ascended and going down backward. Afterwards at long intervals and when overworked such reversal occurred. "In the street if the action of walking suddenly ceased to be automatic and he recalled the fact that he was walking, he would sometimes walk backward a few steps, and finally recovering himself would go on as before. After a while he had great difficulty in ascending the stairs in the usual way, and was ordinarily unable without effort to go upstairs foremost. When he was alone he was apt to go up backward, and generally if not watched descended the stairs in the same way. He would go to a door to unlock it and would find himself making an effort to lock it." This symptom was not a serious one; the man continued to be efficient in the ordinary affairs of life, and during the years of this peculiarity he served in the war with distinction. Another case was that of a lady who had the not uncommon habit of turning to the end of a book before she began to read in the usual way; later she had the tendency to go backward through the book with some mental confusion if she tried to read in the ordinary way. Another woman suffering from arterial degeneration and other physical disorder had the tendency to put her shoes on her hands or her gloves on her feet. An officer in the army worn out with service sometimes did the same, and instead of holding his knife in his right hand, held it in his left, although the left was crippled.

A dentist had the habit of saying directly the opposite of what he desired—out of doors, for example, when he meant indoors, a clear day when he meant the opposite. With change of climate and occupation he entirely recovered, and these reversals of statement ceased.

Worry.—The popular terms for interference of association are worry, nervousness, the conditions of being rattled, confusion of ideas, etc. Although worry is a common form of interference of association, the latter is a much broader term, but a large group of illustrations are furnished by the experience of worry. Walton has given concrete cases in an interesting and useful little pamphlet.[31] A vast number of superstitions and idiosyncrasies on the borderline of the pathological also show interference of association in extreme form. The classic case in literature is that of Samuel Johnson as reported by Boswell.[20] As his biographer reports the case, he suffered from obsessions of various kinds, and at one time interference of association seems to have been a very common phenomenon. As Boswell describes it:

He had another peculiarity of which none of his friends ever ventured to ask an explanation. It appeared to me some superstitious habit, which he had contracted early, and from which he had never called upon his reason to disentangle him. This was his anxious care to go out or in at a door or passage by a certain number of steps from a certain point, or at least so as that either his right or his left foot (I am not certain which) should constantly make the first active movement when he came close to the door or passage. Thus I conjecture; for I have, upon innumerable occasions, observed him suddenly stop, and then seem to count his steps with deep earnestness; and when he had neglected or gone wrong in this sort of magical movement I have seen him go back again, put himself in a

proper posture to begin the ceremony, and, having gone through it, break from his abstraction, walk briskly on, and join his companion.

Some of Walton's illustrations are instructive here. For example, he cites the case of a man who leaves his office at night, and then it occurs to him that he has not locked his door. If he is a normal man he goes back and tries the door and then goes home and thinks no more about it. The neurotic, on the other hand, goes back and tries the door, and then is not satisfied, but goes back again and again. In either case as the man walks away from his office there is interference of association, but in the abnormal case it becomes chronic.

Of the doubting mania, Walton gives the following example: [31]

A gentleman once told me that after mailing a letter he would often linger about the box until the postman arrived, and ask permission to inspect his letter, ostensibly to see if he had put on the stamp, but in fact to reassure himself that he had really mailed the missive, although he knew perfectly well that he had done so. The life of the chronic doubter is full of these small deceits, though in most matters such persons are exceptionally conscientious (p. 89).

The significance of such doubts for the mental health, Walton notes as follows: [31]

With regard to immediate doubts, if the overscrupulous business or professional man, worn out after an exacting day's work, will stop and reflect, he will realize that much of his exhaustion is due to his having filled the day with such doubts as whether he is doing the wrong thing, or the right thing at the wrong time, whether he or some one else will miss an appointment or fail to meet obligations, and whether he or his assistants make many blunders (p. 93).

Conscientiousness.—Among the best illustrations of interference of association are the phenomena of normal and morbid conscientiousness. Men like Napoleon, to whom most matters are not questions of conscience at all, are usually clear in their thought and straightforward in their action. Men like Amiel, to whom the choice of every phrase is a matter of conscience, are the extreme examples of confusion of association. Amiel's *Journal,* in fact, furnishes some of the best possible illustrations of such interference of association.

Of his difficulty in composing he says:[1]

> I have been working for some hours at my article on Mme. de Staël, but with what labor, what painful effort! When I write for publication every word is misery, and my pen stumbles at every line, so anxious am I to find the ideally best expression, and so great is the number of possibilities which open before me at every step.
>
> Composition demands a concentration, decision, and pliancy which I no longer possess. I cannot fuse together materials and ideas. If we are to give anything a form we must, so to speak, be the tyrants of it. We must treat our subject brutally, and not be always trembling lest we are doing it wrong. . . . I am always retracing my steps: instead of going forward I work in a circle; I am afraid of having forgotten a point, of having exaggerated an expression, of having used a word out of place, while all the time I ought to have been thinking of essentials and aiming at breadth of treatment. I do not know how to sacrifice anything, how to give up anything whatever. Hurtful timidity; unprofitable conscientiousness; fatal slavery to detail! (p. 355).

Everyday Examples.—Although such extreme cases may be unusual, all children, as well as many adults, in the presence of an uninviting task are likely to show interference of association. The following illustration given by William James with a slight change of the

words would apply to many children with their school tasks.

I know a person, for example, who will poke the fire, set chairs straight, pick dust-specks from the floor, arrange his table, snatch up the newspaper, take down any book which catches his eye, trim his nails, waste the morning *anyhow*, in short, and all without premeditation—simply because the only thing he ought to attend to is the preparation of a noonday lesson in formal logic which he detests. Anything but *that!*

This interference of association is often not clearly conscious. Many illustrations are furnished by the psychology of memory, in everyday life. Freud, as the result of his investigations, maintains that our thoughts, our acts, our errors in recollection, our mistakes in speech and in act, are not mere matters of chance but are governed by definite laws. Specially what we recall is determined not merely by conscious association but also in large degree by unconscious or subconscious affective and voluntary processes.

In all of us there are innumerable deep-rooted impulses, wishes, and tendencies; some of them innate, others acquired; some perhaps subconscious, repressed by education and convention, and yet capable of showing their force in unusual situations and especially when we are off our guard, as in plays and games, when, as is recognized by everyday psychology, one is likely to show one's real character. These are liable at any time to conflict with our conscious processes and to cause mental discord, confusion, or interference of association.

Again Freud emphasizes the influence of the will and affective processes in recollection. This is most clearly and dramatically shown in pathological cases.

If a person has been the victim of some shock or the like and had an experience repugnant to one's general character, this is likely to be thrust out of consciousness as much as possible. Such repressed memories may have a most disastrous effect upon the mental life, causing constant disturbance of the nervous and mental health, even when they have been so thoroughly repressed that the essential features of the experience have been forgotten by the individual. All of us harbor repressed complexes of ideas. Every one has some skeleton in his mental closet.

Ways of Reducing Conflict.—In accordance with the law of inertia, as Lombroso might say, or as a result of this passion for unity of the mental life, the individual strives in all such cases to reduce the conflict, and this is done in different ways. Among the chief are the following:[15]

1. One method of settling conflict is a decision in favor of one side or the other. This is normal, and the person with strong character will be able in this way to unify the mental life, or at least to reduce the interference of association from the conflicting aims and desires to a minimum. Once for all, having taken sides and having renounced all conflicting aims and desires, the unity of the mental life grows more and more perfect and temptation grows weaker and weaker.

2. In case of those who have not the strength of character and the clearness of vision to make a decision in favor of one side or the other, the method most commonly adopted is probably that of repression. As most men dislike to make decisions, conflicting claims and desires and ideals are repressed, thrust out of memory as much as possible. All of us resort to this method of repression in a vast number of distracting situations, and a

certain amount of such repression we are able to endure. When, however, the repressed complexes of ideas are too strong for the given individual a pathological psychosis of some kind occurs.

3. When the conflict between the repressed complexes and the normal stream of thought becomes unbearable, the former are more and more dissociated from the latter, and in extreme cases the dissociated complexes may become a secondary personality.

Conflict and Insanity.—Hart, in his excellent little primer on *The Psychology of Insanity*, maintains that conflict is a fundamental factor in the causation of insanity.[15] The pathological mind has lost the homogeneity which is the ideal of normal personality, and has become disintegrated into more or less independent portions. But this disintegration invariably owes its existence to the presence of a conflict. The mind contains elements incompatible with each other, a dissociation has arisen as a method of avoiding the storm and stress of the warring elements. It is biologically a refuge, a protection, one of nature's methods of dealing with conflicts which seem insoluble. Dissociation, repression, and the like, are secondary results, not primary causes.

Dissociation itself, however, is to a certain extent a normal protection against interference of association. All of us have certain more or less water-tight compartments in our minds, and while this may not be an ideal type of mind, the dissociation does often protect one from confusion. Hart illustrates this as follows:[15]

> Although the phenomena just described are so bizarre, and so characteristically insane, yet this dissociation of the mind into logic-tight compartments is by no means confined to the population of the asylum. It is a common, and perhaps inevitable, occurrence in the psychology of every human being.

> Our political convictions are notoriously inaccessible to argument, and we preserve the traditional beliefs of our childhood in spite of the contradictory facts constantly presented by our experience. Such phenomena can only be explained by the existence of a certain amount of dissociation, and, though less in degree, it is precisely similar in kind to the dissociation which permits the asylum queen to scrub the ward floor, serenely unconscious of the incongruity between her exalted rank and her menial occupation (p. 57).

These mental conflicts of the severer sort usually arise in connection with the great fundamental human instincts, especially with the social instincts. Freud has shown how largely the sex instinct is involved, and Hart has called attention to what he calls the herd instinct, or what would better be called the group instinct; and he cites Trotter, who has made a study of the sociological significance of this. Hart suggests that the fundamental mechanism which underlies the vast group of insanities where individuals show unsocial tendencies, indifference to the ordinary conventions of society, and the like, consists essentially in a repression of this instinct.

The significance of these pathological cases lies in the fact that the abnormal merely represents in large letters and lurid colors what occurs in case of normal individuals. In all of us there is the same interference of association, the same desire for unity in the mental life. The more cultivated the individual, the wider the interests and activities of the individual, the greater the number of occasions for conflict and interference of association, and, so far as such conflict does occur, the greater the strain upon the mental health. Modern studies in psychology and psychiatry show not only the helpful methods of reëducation in case of the pathological, but they suggest certain important preventives of

interference of association and the conflict and confusion in the manifold distracting situations of life. In general terms these are accepted principles of education.

An Absorbing Aim Gives Unity of Thought.—The predominance in consciousness of some absorbing aim gives unity and coherence to our thinking—Plato's doctrine of the hygiene of the mind, as I understand it.

The child following some spontaneous interest is seldom the victim of interference. It is when dawdling over the uninteresting that his thinking becomes disorderly; if there is a strong emotional stimulus to the work there is little danger of interference.

Freud thinks that no one would make a slip in speaking in the audience of the Emperor, or in a serious declaration of love, or in the defense of one's honor and name, and in short, in all cases where one's whole self is absorbed.

The nature of the human mind is such that for continued interest, continued change is necessary. In fact, it is this need for change that causes the interference when occupied with a monotonous task. Change means stimulus.

Another preventive of interference is what may be called mental perspective. On account of the limitations of human nature one who tries to attend to all details is certain to suffer from interference and likely to neglect essentials.

Again, the dependence of orderly association on good physical condition is a matter of everyday observation. In abnormal nervous conditions, interference is a common phenomenon. The mistakes in the school, Bönhof has noted, are largely correlated with fatigue. The child speaks and reads and writes relatively smoothly in the morning, but toward noon makes many errors.

Practical Suggestions

What is the practical significance of all this for education? Is the demand for habits of orderly association really important? When one reflects how much can be done for those actually suffering from mental disorder by reëducation and by developing habits of orderly association, one is forced to believe that a vast deal can be done by education in the way of prevention of pathological mental habits. This condition of mental health, namely, orderly association, involves a fundamental and far-reaching principle. It should be considered in all arrangements of programs and subjects, in all methods of instruction. If we can prevent the development of habits of disorderly association, we shall do much for the mental health of the individual; for interference of association is often the germ of worry and the beginning of fear.

Although some normal people are never clear and straightforward in their thinking, and their mental vision is blurred with a kind of mental dyplopia, children, however, after the confusion of the early years, usually think of one thing at a time. Unless perverted by artificial training, they can tell clearly what they have seen. Of the things they know and are interested in, they can write with Homeric simplicity. But we give them information unconnected with experience, instruction with little training, knowledge without opportunity to apply it, tasks for which they have little ability, and that they cannot do well, exercises in mathematical logic without proper basis in concrete experience of real things, and demand oral or written description without first-hand knowledge. It is not strange that presently they become confused in their thinking and

the victims of interference of association or acquire the habit of thinking of two things at once.

Attention Shifts.—Really in such cases we do not attend to two things at once. If we could actually think of two things at the same time, it would be well; but, as a matter of fact, in such cases the attention quickly changes from one thing to another, and nothing is attended to normally and for a sufficient time to be seen clearly and in right relation.

The waste of energy and strain from such interference of association may be illustrated in almost any occupation of children or adults. In every lesson in the school, in every game on the playground, in almost every experiment in the laboratory we get illustrations. Instructive examples are furnished by the various plays and sports. Every player and every fan knows the seriousness of the situation when the player becomes rattled. Brickley has described the strain on the football player of trying to think of two things at once.

> In football it is pretty certain that the defensive back, catching kicks aimed directly at him all the afternoon, suffers more mentally than the man who has to run for every ball and who has to make his catches on the jump. Surely nothing could be more nerve-racking than the thought of the swift rushing enemy ready to throw one back at the minute of the catch, accompanied by the thought that the catch must be made or the game lost. Watch the successful player in this position and you will see that he is caught utterly off his balance if he is tackled at the exact moment he catches the ball. He makes sure of the catch. Then he turns his mind too quickly to the other part of the problem, the matter of eluding his tacklers. The man who tries to do both things at once, who cannot keep his mind off the tacklers until he has caught the ball, is like the well-known baseball failure who

insists upon throwing the ball before he catches it, a very common sort of "stage fright" in a baseball pinch.

Unhygienic Efficiency.—The message of mental hygiene for the school is also in the interest of true efficiency in contrast with a false economy that sometimes prevails. Some people always try to increase the span of human life by lengthening the hours of work, by omitting exercise, by shortening the hours of sleep, or the like. Our forefathers taught us that we must improve the minutes, and often they resorted to pathetically futile devices for economizing the golden moments.

Notable examples are the case of the great scholar F. A. Wolf, who boasted that he had cut down the time for his toilet to three minutes a day, and who used to study with his feet in a pan of cold water with one eye tied up to rest while he used the other; and that of President Timothy Dwight of Yale, who as a student reduced the food that he ate so that he could omit all exercise, who learned 100 lines of Homer before the 5 o'clock chapel service at Yale, and who paid the fiddler a few months later by nervous breakdown.

Such men usually suppose that by these devices they can in some way make the days longer than they are, thwart nature, and by economy, efficiency, or what not, get more work and experience out of the world than the conditions of human life permit. It is the fallacy of the farmer who should imagine that by using a certain kind of scythe he can get more hay out of a field than there is grass growing in it.

The modern successors of these men are the efficiency experts. They, however, have done much better; by applying scientific methods as regards proper alternation of work and rest and by eliminating unessential

movements they have done wonders in regard to the lifting of pig iron, brickmaking, and more complex activities by eliminating unessential movements.

Lack of Perspective.—The trouble with all our methods of efficiency, however, is that they would make us efficient in the things that do not so much matter, and they fail to make us efficient in regard to the vitally essential things, which are not the movements of the hands, but the processes of the human mind and the making of right choices. What shall it profit a man if he gain all skill in excluding unessential movements in performing his tasks, if the tasks themselves are not worth doing?

The directions given by the efficiency experts, the excellent economic habits described and the way of ordering one's life to enable one to perform one's work in a systematic manner, and live a sober, orderly, and mechanical life, are legion in number, and helpful; but are very apt to be lacking in perspective. Illustration of the methodical man given in one of the helpful little books by Parkyn is the following:

> He devotes the compartments of his pocketbook to different things, but these things are always to be found in their places —stamps in one, his own cards in another, business cards of other men in another, bank bills in another, etc. His knife is in one pocket, his pipe and tobacco in another, matches in another, and when he has a banknote changed, the pennies go into one pocket, the nickels and dimes into another, and the quarters and half dollars into another. He set about forming this last habit systematically and now separates his change automatically and distributes it to his pockets as soon as he has counted it. The result is that he never has to hunt through several pockets for carfare.

All this is beautiful in its simplicity and most admirable as an example, and yet we have seen cases of such models of efficiency who were quite upset by a slight change in conditions. If, for example, under the stress of unusual circumstances this paragon of orderliness puts his knife in his waistcoat pocket instead of his right-hand trousers pocket, he hunts with distraction all over the house for his lost knife because it is not in the usual proximity to his keys. That it should happen to be in another pocket is unthinkable, and so he hunts in vain for it while it is within a quarter of an inch of him all the time.

The formulation of the laws of optimum muscular activity and of muscular fatigue by Mosso and Maggiora some thirty years ago was a significant contribution to the science of manual work and industry. To this beginning the modern efficiency engineers have added much in developing methods of excluding unessential movements.

But a greater problem awaits investigation, namely, that of methods of eliminating unessential and distracting associations from our thinking, a problem important for the mental health as well as for education. How many are these unessential ideas is shown in the child with his school task, the adult in his business, and often in the great thinker and writer.

Interference in the Untrained.—Every one has noticed how the child learning to write moves not only its hands, but its tongue, the muscles of the face, and, as Lewis says, even those of his feet. When it has mastered the art, there is the proper association in the nerve-elements corresponding to the motor organs, and unessential movements are excluded. A similar lack of coördination occurs in the intellectual activity of the untrained.

Their ideas do not reproduce themselves in ideas germane to the subject of thought and no other; but many foreign and unessential elements enter consciousness on account of unstable or improper association of ideas and weakness of the power of attention. With some this defect is so great that they can never talk long upon one definite point. Readers of Carlyle will remember the description of Coleridge's conversation given in the *Life of John Stirling*: that "aimless, cloud-wrapt, cloud-based, lawlessly meandering human discourse of reason," which bitterly reminded one of Hazlitt's account of it: "Excellent talker, very—if you let him start with no premises and come to no conclusion." Making all allowance for Carlyle's habit of exaggerating, and the possibility that sometimes he could not understand Coleridge when the latter talked sensibly, still Coleridge's talk seems to have indicated the nature of his mental activity, and this account may serve as a sublime example of the "lawlessly meandering" thought of the untrained.

It is unnecessary to multiply illustrations. Examples are familiar to everybody. Modern psychology does suggest at least some of the methods by which such unessential elements may be excluded from the training of children.

The aim of education is to make the new fuse with the old and become part of one's personality. Education would be easy if we had only to make sure that pupils learned a certain number of things in an ordinarily accurate manner; but the question of education is much more than this. It means the development of habits of attending to the essential and of ignoring the unessential, of orderly association in regard to at least

a part of the field of human thought and experience, and the assimilation of what is learned.

Many Associations Cause Many Errors.—It is one of the paradoxes of education that in order to remember we must associate an idea with many other ideas, but the larger the number of associated ideas the greater the danger of error. The following illustration from my own experience is typical:

Before I learned German I had no trouble in spelling the word *school*. But the other day I wrote the word *Schule* for it. I was writing English. I had no intention of writing German; but I was in haste. I gave attention merely to the beginning of the word *Sch*. If I had not studied German, but had specialized in English, the rest of the word would have come out all right; for the movements involved in making *sch* would have been firmly and clearly associated with those involved in making *ool*. But now the combination *sch* is associated in two series as the initial letters; and this makes error possible. If, as we may infer, we have here a typical illustration of what occurs in such cases, then one of the essential conditions of recollection is often a cause of interference and error.

It is precisely this fact, namely, that the greater the number of associations the greater the liability to error and interference, that makes mental hygiene necessary. In case of the uneducated person there is usually, perhaps, relatively little interference of association, except in regard to emotionally exciting events, but for the student or the man of affairs, whose work makes manifold associations necessary, mental hygiene as regards association becomes essential, and in the school it is of prime importance.

Frequently in our experience this interference of as-

sociation is not clearly conscious unless we introspect carefully. Gamble, in her study of memorizing by the reconstruction method, gives interesting illustrations. She writes:[12]

Proper names which have a certain arbitrariness and cannot be recalled by any process of logical memory, have sometimes a maddening fashion of slipping just beyond one's reach when most wanted, behavior which is probably due to the reciprocal inhibition of associations which run out from the ideas which ought to bring them up. If one is asked, "What did David say in his haste?" or "What did Portia say about mercy?" one answers with mechanical glibness: "All men are liars" or "The quality of mercy is not strained; it falleth like the gentle due from Heaven"; but if one is asked *"Who* said in his haste, All men are liars?" or *"Who* said, The quality of mercy is not strained?" though one may answer promptly, "David" or "Portia," yet the reproduction-reaction time will be a little longer, and one may be conscious of the swift mediation of other images—perhaps of an open Psalter or of a mediæval courtroom. One may even detect and suppress a conflicting association with the mercy-quotation; a New Testament scene or one or more of the Beatitudes may flash through one's mind, even when one seems to others scarcely to hesitate in giving the right answer (p. 196).

The first guarantee of efficiency in recollection is the possession of habits of orderly association, and any method of learning is to be judged by considering its effect in producing or hindering such habits. Any method that loads the mind with unnecessary material and that tends to develop a habit of attending to the unessential and of forming superficial or irrelevant associations is a distinctly bad one. Hence the danger connected with some of the mnemonic systems, the danger from pedantic methods of teaching, and from lack of

perspective in learning. The waste of energy involved Watt has well described as follows:[32]

A wrong association is very hard to eradicate. It introduces an element of competition into the working of the associations, and if a wrong association has become powerful enough to recall its word, the consequence will be that, in order to repress it, the correct association will have to be worked up to much beyond the strength necessary for the reproduction of its word, had no false and competing association been formed. To make the correct association compelling, it will have to be raised to that strength which will enable it to reproduce its word more quickly than the false association can reproduce its word. This means a great deal of useless and unnecessary labour.

Time Is Necessary.—The writer has elsewhere attempted to show that time is necessary for the organization of impressions and associations.[6] In cases of amnesia due to shock, or the like, where loss of memory extends only to a relatively short period preceding the cause of it, that is, in cases of so-called retroactive amnesia, the amnesia may be due to the fact that the memory was never completely organized. In normal memory the process of organization is continually going on, and in order that ideas may become a part of the permanent memory, time must elapse for the organization or consolidation to be completed. Anything that interferes with this hinders acquisition. Evidence seems to be added by unpublished studies by Dallenbach showing that a period of eight hours of sleep is much more favorable to retention than a waking period of eight hours.

Bergström and others have since found experimental evidence of this process of consolidation. Müller and Pilzecker found that in learning nonsense syllables less

was retained, if immediately after learning a series, the observer was required to concentrate attention on some other task, and they assumed that the mental strain of the latter checked the consolidation process necessary for a permanent memory. This result strongly suggests also that interference of association occurred due to the task requiring attention.

That interference of association is especially likely to occur in the first few minutes after anything has been learned seems to be most strikingly illustrated by these experiments of Müller and Pilzecker. After learning a series of nonsense syllables by the method of paired associates, they gave the observer a task requiring concentration of attention a few seconds after the learning of the original series was completed. Again, in another series the task requiring attention was given six minutes after the original series was learned. A test was made of what was retained an hour and a half afterwards, and it was found that of the first series only 28 per cent was remembered; of the second series, 49 per cent. In the case of the latter the process of organization of the original series apparently had been largely completed. In the first series there was not time for organization before the distraction was given, hence less was remembered, probably largely on account of the greater interference of association.

Haste Defeats Its Own End.—The practical bearing of this is obvious on a moment's reflection. Haste in learning defeats its own end, and a short rest may be frequently distinctly more advantageous than continued work. It is especially necessary that suitable periods of rest should occur between the learning of disparate topics. In the schoolroom, for example, from purely pedagogical reasons, not to mention hygiene, it is usually wise

to give a rest of five or ten minutes, at least, after one recitation or the study of one subject, before taking up a different one. The hurry from one topic to another in the ordinary class drill does not usually mean efficiency. Especially, after the learning of a fact or principle of prime importance, a rest of a few minutes to give time for the organization of the memory may be a distinct advantage.

Retroactive Inhibition—Furthermore Fräulein Heine in G. E. Müller's laboratory has shown by experimental investigation that the mechanism of recognition and the mechanism of reproduction are different.[21] Her experiments were in part as follows: The observer memorized nonsense material, then a distracting task was given, and after an interval a test was made, not of what was retained, but of what could be recognized. With the method of recognition there was no evidence of retroactive inhibition of the memory for the material learned. With the method of paired associates, the *Treffermethode,* there was in all cases retroactive inhibition of the memory. This is a noteworthy result, and, although distinctly in conflict with what has been supposed to be the fact by some psychologists, seems to be well established by Heine's experiments. How shall we account for this? The obvious explanation seems to be that in case of the method of recognition there is no interference of association when the test of recognition is made; by any other method there is likely to be interference when the test is made. This is in agreement with general experience. We recognize hundreds of persons and things that we cannot recall by association, or recall with confusion.

The Recognition Method.—The fact, which seems well established, that before the material learned has been

thoroughly organized there is likely to be interference of association with all methods except the recognition method, and the further fact that when the new material has been thoroughly organized, no interference is likely to occur, are distinctly significant for the hygiene and methodology of school work.

For a single illustration of the practical application of this principle take the methods of teaching any subject like a foreign language. In the early stages of learning, when error is certain to occur by the method of reproduction or the like, it is well to use largely the method of recognition. Familiarize the pupil with the different forms by showing them in the book and by repeating them, and do not attempt to have the pupil reproduce them until a considerable familiarity has been acquired. After a good degree of organization of the new forms has been gained, then a more effective method is the method of voluntary reproduction. Wherever, in fact, the method of reproduction can be used without error it is distinctly better, but where error or interference of association is likely to occur, the method of recognition is better.

Correlation.—To illustrate more in detail the way the principles of instruction should be studied from the point of view of mental hygiene, as well as from that of pedagogy in the narrower sense, take the subject of correlation. Merged largely in other problems to-day, it has claimed the attention of teachers for fifty years. Wherever teachers have gathered, and wherever educational periodicals have been read, the means of properly correlating the different subjects of instruction have been considered. But the problem of correlation is one of hygiene as well as of pedagogy. Many different subjects demand a place in the curriculum. It seems necessary

that several branches should be pursued simultaneously. These subjects, however, must not be taught in a haphazard manner without relation to each other. Without correlation the numerous subjects of the modern program are likely to cause confusion and overpressure.

How may different subjects be taught simultaneously without confusion? One method is isolation. Harris has this is mind when he says in the Report of the Committee of Fifteen: "Your Committee would call attention in this connection to the importance of the pedagogical principle of analysis and isolation as preceding synthesis and correlation. There should be rigid isolation of the elements of each branch for the purpose of getting a clear conception of what is individual and peculiar in a special province of learning."

On the other hand, correlation is an important means of avoiding confusion. The demands of hygiene in regard to correlation result directly from the psychology of memory and association. To appreciate their significance we may again take illustrations from the psychology of memory.

Unconscious Traces.—Ebbinghaus in his classic experiments upon memory found that after learning a series of nonsense syllables, although the memory of it was so evanescent that after twenty minutes he was unable to recall the series, still certain traces persisted unconsciously, so that even after a month the same series could be relearned in less time than was required for a new one.[9] We notice the same in ordinary experience. A forgotten poem or lesson is relearned more easily than an altogether new one. These unconsciously persisting elements we may suppose are entirely physical. They are simply the traces of neural habit; yet they are potentially related to consciousness, and are important.

Bergström's Experiments.—Further the experiments by Bergström showed that such unconscious traces or rudimentary habits of association not only aid in relearning an old series of associations; but that under certain conditions they hinder the acquisition of a new series.[3] In one series of experiments Bergström tested distinction and choice times by having the subject of his experiments sort ordinary playing cards. Eighty cards were used in a pack, and there were ten kinds of cards, each marked by an abstract word printed at the top. The observer sorted these cards as rapidly as possible into ten piles corresponding to the ten kinds of cards, chance determining the order of the piles. Each experiment consisted in sorting two packs containing the same words into different piles. For example, one of the ten groups of cards, we will say, had the word *suggestion* printed at the top. In the first half of the experiment these cards perhaps were placed at the right, in the second half, in front of the observer. Another group was placed at the left, perhaps, at first, and at the right in the second half of the experiment, and so on. It was found that in sorting the second pack the time was longer and the observer seemed confused, showing a tendency to place the cards in the positions they had had in the first half of the experiment. Two different reactions were associated with the same sensory stimulus and interference resulted. Bergström's results do not, perhaps, show quite clearly how far the delay was due to these unconsciously persisting traces. But they do show, apparently, that during the process of acquiring such a series of associations, interference is likely to occur if different series are learned one after the other in immediate succession.

Experiments by other investigators indicate the same

On the other hand, experiments by Münsterberg in replacing old and well organized habits—like the dipping of a pen in ink, the putting one's watch in a given pocket, and the like—by new ones, showed that after the new series of motor associations was thoroughly learned, either the old or the new could function automatically with little interference from the other, that is, there was no confusion.[23]

Münsterberg's Experiments.—The following will serve as an illustration: Münsterberg had an extended piece of work which required him to sit at his desk writing many hours each day. His custom, like that of most writers, was to dip his pen in an ink bottle placed at the right of his manuscript. He tried the following experiment: Two opaque ink bottles of just the same size and shape were used, one was placed at the right of his manuscript, the other at the left. The bottle at the right was empty, the one at the left was filled with ink. As he wrote, he automatically dipped his pen in the bottle at the right as usual, but getting no ink was reminded that he must try the bottle at the left. A record was made of every time the pen was dipped in the bottle at the right or a movement to do this was made. The result was substantially as follows: Twenty-five movements more or less to the right were made before the new habit of dipping the pen in the bottle at the left was fully established. Then the latter bottle was emptied, and the one at the right filled again. A number of movements toward the bottle at the left were made before the old habit of dipping the pen in the one at the right was reëstablished. Then the same experiment was repeated emptying the bottle at the right and filling again the one at the left. Some eight times the old movement of the hand toward the right was made before

the new habit of dipping the pen in the bottle at the left was reëstablished. But the experiment was continued until, finally, the writer at will could change from one bottle to the other without making any false movements, that is, either habit could function automatically without interference from the other after a single initial impulse from the will.

These experiments supplement each other and they throw an important light upon the psychology of learning. The one series shows that there is likely to be interference of the incipient habits formed during a process of learning; the other indicates that after the paths of habit are well formed there is no interference. Of course, these experiments concern primarily the association of motor reactions with sensory stimuli; but the results are in harmony with those found in other experimental studies of memory, and illustrations from everyday experience might be given for other forms of association.

If, as we may suppose, we have here typical examples of what occurs in all psychophysic associations, then a few pedagogical inferences seem legitimate.

It is clearly important in methods of instruction to avoid this interference of associations. Wherever a large number of subjects are crowded into the daily program, interference is likely to result. But it is necessary to have a number of subjects, for a child's attention cannot be kept long upon one thing. Interest soons flags. It is necessary both for psychological and hygienic, as well as for practical reasons, to have variety in the daily program. The psychology of association indicates the plan that is hygienic. Sometimes isolation is a means of avoiding interference, sometimes correlation.

The Principle of Correlation.—The principle would seem to be as follows: When the similar mental processes involved in learning two subjects are the essential thing, and when the differentiæ and details are unimportant, correlation or concentration is advantageous. It is itself a means of avoiding interference of association. Similar processes are repeated in the different subjects, and we get the advantages of repetition without destroying interest. Thus arithmetic and algebra may advantageously be studied together; for similar processes in the two subjects are the essential things, and the differentiæ are relatively unimportant. When, on the contrary, the dissimilar processes and the details are essential, isolation is advisable. For example, if one is learning two similar languages, say Italian and Spanish, for the practical purpose of speaking them, it is well to study one until the associations are well organized before taking up the other; for here the slight differences are important and interference of association would be likely to result if the two were learned simultaneously. Recrudescent memories of Spanish sounds might interfere with articulation in the Italian class; and Italian forms would be likely to be confused with Spanish. Of course, if these languages were studied for some other purpose, say for a general philological purpose, the reverse might be true. Cognate forms would naturally be studied together. Thus, where the dissimilar elements and processes are essential, there should be isolation rather than correlation. For example, the correlation of arithmetic and religion, frequently attempted in the past, would seem to be unwise.

This principle concerns not merely the matter of correlation in the program; it should be regarded also in the more concrete questions of method.

Learning of Homonyms.—A great many concrete educational problems come here. What is already known throws light upon some of them. Where two series are to be learned, several members of which are common, as *h b c i f* and *h b e i l,* should they be learned together or separately? The answer to this, as already pointed out, depends upon the purpose for which the two series are learned. If they are learned together, there should be a large number of repetitions to insure the permanency of correct associations. Usually, it would seem to be better to study the two series separately at first until they are pretty firmly impressed upon the mind, because there is likely to be interference of association, if not actual error, when the two are studied simultaneously. Take a single concrete example: one of the chief difficulties in orthography is the spelling of homonyms and the like—similar words, such as the verb *advise* and the noun *advice; council,* the name of a deliberate body, and the *counsel* of wise men to which we are supposed to listen. Many are here the victims of chronic interference of association. According to our formula, the spelling of such words should, in the first instance, be taught separately with many repetitions, not simultaneously as is often done; for here the differentiæ are essential. Such a problem, however, must be solved by experiment. In this particular case the problem has been studied experimentally by Pearson;[25] and though, it is true, his results indicated that fewer errors occur when homonyms are studied together, apparently he did not determine in how many cases the pupils tested by him had already mastered one member of the pairs studied; and recent experiments by Finkenbinder indicate that so far as experiment is concerned, this problem is at least still open. His inferences seem reasonable.

He says in the *Pedagogical Seminary* for September, 1923:

Our tentative conclusions, tentative because of small amount of data, are that *homonyms are most economically taught in the context in which they belong,* that is, separately rather than in pairs, that certain confusions arise when the two of a pair are brought together before either is thoroughly learned, and that for *permanent retention,* the "separate *method" is far superior to the method commonly employed of studying both words of a pair of homonyms together.* It is apparent that *homonyms are not as readily learned as are other words;* and *this,* we believe, *is due to the interference of association* that seems most certain to arise as a result of a similarity in sound of words but difference in spelling and meaning.

A next experiment in this field might well answer the question whether or not *some* homonyms might advantageously be presented together in pairs, and, if so, which ones? It may be that certain pairs could most profitably be brought together for study when one of the pair is well learned. And finally the question arises which word of each pair should be learned and habituated first? This will probably be answered definitely by referring to the relative need of the pupils for the various words. As an illustration, no doubt *valley* should be presented in connection with its context rather than, as is done in some spelling books, with *valet* which may well be left to be learned incidentally later if needed (p. 250).

This is given merely as a concrete illustration of the hundreds of problems in the hygiene of instruction that should be studied with regard to the development of orderly association. If in all school methods and school occupations such principles were regarded throughout the whole period of school life, not only would a vast amount of waste and confusion be avoided, but the

habits of clearness and orderly thinking developed would, we must infer, have significance in the integration of the pupil's character. Such development of orderly associations and the avoidance of confusion and interference represents the real mental efficiency to which school training should make its prime contribution.

So much for the hygienic aspects of correlation. I may be more or less right in the way I have formulated the practical principle stated, but the general principle is clear enough. The aim in correlation should be to avoid interference of association as much as possible. The hygienic importance of this is obvious when we recall that usually confusion is a form of worry.

Of course, careful thinkers often come to practically this same conclusion when they aim to correlate according to the natural relations of things; but the point to be emphasized is that the practical pedagogical problems of correlation and the like should be studied from the point of view of hygiene and the psychology of association as well as by the more strictly pedagogical method usually adopted. This would not only be of advantage hygienically, for avoiding confusion and worry, but it would also check the abuses of correlation that its most ardent advocates deprecate.

In the organization of the curriculum, the articulation of the grades, and the like, as well as in the concrete methods of instruction, this principle of orderly association should be regarded. As a matter of fact, it has often been strangely ignored in the schools; but here and there an experiment has been tried by a method of concentration in accordance with sound principles. At Frankfurt, in Germany, for example, such a plan has been adopted for many years in the teaching of foreign languages in the secondary schools.

The Frankfurt Plan.—For example, in the Gymnasium in Frankfurt, French takes the place of Latin in Sexta, the first year of the course, and no other language is given for the first three years; thus the pupils concentrate on this language until its forms are pretty thoroughly organized. Then at the beginning of Unter-Tertia, the fourth year of the course, when pupils are perhaps twelve years of age, the study of Latin is begun. French is continued, but with the thorough organization already acquired there is little danger of interference of association, and the larger part of the time is devoted to Latin, some five to ten hours a week. Then after two years more, when the Latin forms are thoroughly organized, that is, at the beginning of Unter-Sekunda, when pupils are perhaps fourteen years of age, Greek is begun. Latin and French are continued, but their forms are so thoroughly organized that it is possible to take up a third language without much danger of interference.

Whenever new subjects are taken up, it would seem wise that there should be concentration on a single subject for a sufficient length of time for thorough organization of the essential forms, and that related subjects should not be begun until the organization is sufficiently far advanced to hinder interference of association.

In all methods of learning the same principles should be remembered. In committing to memory, for example, the whole method is better than the part method, not only because the task is usually learned more quickly by the whole method, but also because with the whole method there is less occasion for interference of association. Thus in learning a stanza of poetry it is an advantage to learn it as a whole. With the ordinary method of learning by lines an interfering association is liable

to be formed between the end of a line and the beginning of the same line.

Interference and Error.—In most errors, such as are made in the schoolroom, there is interference of association. On the other hand, that errors are likely to cause interference of association has been shown by convincing evidence. Culler, for example, reports the results of his own experiments as follows: [8]

> The records as well as the introspections show that one error tends to cause another. This is what Book means when he speaks of "bad associations," "bad tendencies" and "interfering habits." Errors are not grouped by mere chance, but an error makes an interfering association which is hard to overcome. The cause of the grouping of errors is due to these bad and interfering associations. Book finds that in some cases it takes a very long period of time for them to drop out, and that not until they do drop out can there be unimpeded progress. He cites the case of a music teacher who recommends that in learning to play a piano, it is better to practise in periods of 15 minutes with recesses, than to continue for an extended practise, because of the fact that interfering tendencies do come in and cause error. When these drop out again, gain can be made without the strain and useless labor that would be expended in a long practise at the time. This accounts for the little improvement on some days and the smooth progress made on other days.

The desirability of helping pupils beforehand on the lesson of the following day is obvious. Right forms and correct methods can be emphasized and error avoided. In all forms of motor training, including reading and speaking, it is especially important to avoid error; and, unless in the first instance the teacher goes over the lesson with the pupil, mistakes are almost sure to occur. In many schools it is the custom to give special drill at the end of the recitation on the work of the succeeding

lesson, in order that the pupils may in their study by themselves drill on correct forms. In general the aim should be to avoid error rather than to correct it.

Again, in the ordinary questioning of the classroom it is well to remember that where children are especially interested in one special point, as is often the case, it is wise to let them express themselves on the topic on which they are interested and get it off their minds wherever it is possible, otherwise interference of association is almost sure to occur. It is true that pupils should be trained to give attention to the present situation; but when they come into the schoolroom their interest in the previous present situation is often so great that until they have fully expressed themselves upon that it is impossible for them to concentrate on the new situation.

Clear Instructions Important.—Recent studies, especially experimental investigations of the higher thought processes, have shown how important are the instructions given by the experimenter in determining the attitude and associations of the observer. Under certain conditions, for example, positive instructions make for unity and clearness, negative instructions tend to produce interference of association. Geissler in his experiments found evidence "that a simple positive instruction sets up only one determining tendency, in accordance with which certain mental processes are neurally prepared for easier and quicker entry into consciousness as soon as the proper stimulus occurs; while a negative instruction sets up at least two determining tendencies, which either bring about a more or less conscious conflict of two mutually exclusive motor reactions, as in the attitudinal form of suppression, or prevent their ideational representations from issuing in motor discharge,

and thus allow another neurally prepared process to lead to a reaction, as occurs in the ideational form of suppression." *

Wrong Attitudes.—Whenever students come to a recitation with a wrong attitude, there is sure to be interference of association. Of course, this may be an attitude of repugnance to the subject, or dissatisfaction with the method employed, or dislike of the teacher, or a critical attitude, or an attitude of indifference, or what not, but in any case it is likely to cause confusion.

At the ordinary school examination one finds many illustrations of interference of association. The necessity of finishing one's work in a given time, the importance of answering as well as possible, the fear of failure, and the like, all are liable to produce interference and confusion.

Finally, it should be remembered that the attention of children is not as easily adjusted to a new situation as that of adults. More time is required for them to turn attention from one thing to another. Until they are able to adjust attention to the new, interference is likely to occur, and both in discipline and in instruction allowance should be made for this slower process of adjustment in case of children.

More freedom and less instruction by the teacher often would mean clearer thinking and less interference of association as suggested by W., a pupil aged eleven years, who reported her opinion of the Dalton plan to Miss Parkhurst as follows: [24]

In some schools when you go into arithmetic you have to do arithmetic for half an hour, and you have to do so much that you get mixed up. Here, when you begin to get tired and can't make your mind work right on one thing, you

* *American Journal of Psychology*, Vol. 23 (1912), p. 213.

can go into another room and forget all about the first thing, so you don't get muddled up. Later, you can do the first thing.

Interference Akin to Worry.—In the schoolroom the phenomena of interference of association are common. They appear in a great variety of forms from mispronunciations and errors in motor adjustment, mistakes in spelling, and the like, up to the extreme forms of distraction and worry on the borderline of the pathological. Bönhof, for example, has pointed out how frequently mispronunciations occur in the schoolroom.[5] Not an hour, he says, passes but the teacher or pupil makes such mistakes. Almost everybody makes them—children and adults, cultured and uncultured, rural and urban children alike. The teacher can learn much from such phenomena, and on his part he can do much to eliminate them.

Thus in all methods and subjects the principles of orderly association should be considered. This whole matter is really so fundamental in the hygiene of instruction that all methods of learning and of teaching should be judged by their value in producing orderly habits of association. And any method or device, or sequence of subjects, or the like, which is likely to cause interference of association, is looked upon with suspicion from the point of view of mental hygiene.

If, perchance, these suggestions seem to the reader remote from practical hygiene, let him recall that interference of association, error, and confusion, usually mean the beginning of worry—the great enemy of mental health—and that positive hygiene prefers the development of healthful habits of mental activity in the school to reëducation in the sanitarium.

Summary

1. Interference of association is inevitable on account of the fact that simultaneous stimuli of the nervous system may conflict and be more or less mutually inhibitory.

2. In highly trained individuals capable of mental work interference should be exceptional and not continuous. It means great waste of energy, and when habitual is liable to be the cause of nervous disturbance.

3. It is of fundamental importance for the healthful development of the nervous system and for pedagogical efficiency to avoid interference of association as much as possible in all forms of school work, not only by methods of instruction and of learning, but also by the arrangement of programs and the like.

4. In arranging the program, the practical rule should be: Where the similar processes in two subjects are the essential ones, then correlation is advantageous. It is a means of avoiding interference of association. On the other hand, if the differentiæ and details are the essential things, then isolation of the two subjects is advantageous as a means of avoiding interference of association.

5. Time must be given for the organization or consolidation of what has been learned. Interference of association is most likely to occur in the first few minutes after the acquisition. Thus it is of practical importance at the close of a period of study in one subject or after the learning of a specially important fact or principle to give a few minutes for rest. A recess of five or ten minutes may be more important for the fixing of what has been learned than continuous study. The consti-

tution and character of the nervous system make the need of time for organization imperative. Haste defeats its own end. Eight hours of sleep is often pedagogically as well as hygienically better than eight hours of study.

6. The secondary results of school instruction are of primary importance for hygiene; and many of the so-called secondary results are also of prime importance for pedagogy.

7. The development of habits of attention and orderly association is quite as important for the prevention, as reëducation for the cure of nervous and mental defects.

8. The prevention of mental conflict is important for the mental health. The way to begin is by preventing interference of association in school work.

Problems and Questions

1. Why has the law of association of ideas been sometimes compared to the law of gravitation in the physical world?
2. What methods in your work and in school instruction have you found helpful for clearness and orderly thinking?
3. What methods of teaching have you observed that were especially helpful for producing clearness and orderly association?
4. Report cases of mental conflict that you have known.
5. Report a good case of mental conflict from Holt's *Freudian Wish* or from your other reading.
6. What means of preventing such conflicts can you mention?
7. Give cases of attempts to avoid conflict by the defense mechanisms of dissociation similar to the common ones mentioned by Hart.
8. Report incipient cases of mental conflict or interfer-

ence of association from your general reading similar to the case of Amiel.

9. Can you report any cases of mental conflict where the individual was not conscious of them?
10. What, according to your observation, are some of the most common causes of confusion and interference of association in the schoolroom?
11. State what you think are the most helpful means of avoiding confusion and interference of association in school work.

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CHAPTER XVII

DISCIPLINE AND THE MENTAL HEALTH

DISCIPLINE, in the narrower sense of keeping order, has been the occasion of a vast literary output of wit, wisdom, comedy, and tragedy. The net result has been a rather hopeless conflict of opinion, as illustrated in the discussions on discipline in the *Outlook* a few years ago.[24] In this sense it has had to do largely with the suppression of the individual in order that group tasks might be carried on more efficiently. Thus school discipline is usually looked upon as a means and not as an end. From the point of view of mental hygiene, on the other hand, discipline is a most important aim in itself. It means training in morale, coöperation, and the like, of the utmost value. It has to do with the social significance of school tasks and the social relations and attitudes of the individual which are so important for the mental health. In the wider sense discipline is a systematic attempt to develop conditioned reflexes and habits adjuvant to the tasks of the school and of life.

Discipline in the Narrower Sense.—Since, however, the schools and the teachers in this country are largely concerned with discipline in the narrower sense, we may consider the subject from this point of view, keeping in mind, however, that discipline, even in the sense of keeping order, affords opportunity for training significant for the mental health. It should tend to integrate

the personality. Above all, it should never be of a kind to disintegrate the personality.

Discipline for the Sake of the Pupil.—First it may be noted that in this country ability as a disciplinarian has always been deemed an essential characteristic of a good teacher. Studies of the qualities of merit in teachers by Strayer and Ruediger showed the highest correlations with teaching skill and the ability to keep order.[19] "This might indicate that these items are the most important ones for successful teaching in the grades." Probably the usual opinion of supervisors and superintendents is that the most important thing for success in teaching is the ability to keep order; and the one thing most grade teachers fear more than anything else in school work is the matter of discipline. The ordinary view is of methods of discipline that will aid the teacher. We are now beginning to look at the other side and consider methods of discipline that are helpful to the pupil. Special studies of discipline in the school are desirable. While waiting for these it is helpful to distinguish some of the causes of conduct disorders in the defective.[15] An important beginning has been made by Clark and others.

The Causes of Misconduct

It helps greatly to distinguish the occasions of misbehavior in children. Only in this way is it possible to note the real significance of a child's acts and to adopt preventive discipline in the school. The causes are so many and varied, often so grotesque and amazing, that the help of psychology here is needed. Some of them are readily distinguished.

1. *Physical Disorder.*—A large part of the misdemeanors of children, and their incorrigibility as regards

discipline, result from physical disorder of some kind, physical defect, indigestion, discomfort from excess of heat, uncomfortable clothing, or from aching teeth, adenoids, infections, or the like, and probably sometimes from deep-seated causes, unrelated developments in the endocrine glands and other organs, and malnutrition in some form.

The minor causes are important. For a single illustration recall the fact that perhaps 80 per cent of all school children have decaying teeth, and hence are likely to have toothache more or less acute in form. It is hard to study and behave well with aching teeth. The real significance of such defects is seen best in concrete cases.

One or two illustrations, as I recall them from my own personal knowledge, are the following: A beautiful girl of the best disposition and usually well behaved began to make grimaces and act queerly, and naturally was reproved by her father, without, however, any good results. The real trouble soon was found. The girl had chorea, then rheumatism and endocarditis—the vicious trinity that ruins so many children. Another case was that of a boy very near-sighted. He could not read the examples on the blackboard, he could not see what the other children could see. Instead of copying from the board he naturally borrowed from his seat-mates; and, not strangely, often copied not only the problems, but the answers. He was punished by his teachers, his school work was of little value; he became an object of blame and punishment, until, finally, a teacher found the real trouble and supplied him with glasses. Hundreds of such cases could be cited.

2. *Mental Defects.*—Another cause of misdemeanor is the great variety of mental defects and twists that occur in children either from inherited tendencies, or unfor-

tunate environment, or errors in early training. These are varied and often, from an adult point of view, almost incomprehensible. The modern study of children, especially of pathological cases, has furnished many illustrations. All the Freudian literature is full of illustrations of the mental twists that come from shocks in childhood, which often become masked in later life, and are revealed only by careful study; further are the vast number of arrests of development in some particular point and the survival in later life of inhibitions, infantile attitudes or the like. A number of these, not so serious as the psychoneuroses, are the result of faulty education in the early years.

Miss Mary Alden Hopkins reports a case in *Every Woman's World,* Toronto, for January, 1916, in substance as follows:

A little girl about 7 years old, of psychopathic character. Among other peculiarities she had a queer habit of smacking her lips. A physician treated her for chorea, and she became much better. But the habit of smacking her lips persisted and seemed to be beyond the child's control. When asked by the psychologist why she did this, she replied that she did not know and could not help it. She could not remember when the habit began. The psychologist, however, was patient and persistent.

After a time she recalled the beginning. Two years before her mother had told her the reason she must always have her window open at night was because she mustn't breathe the same air twice. When she breathed it in, it was good air, but when she breathed it out it was bad air. She drew an unexpected inference from this lesson in hygiene. She thought that since she was forever making good air into bad air she was injuring the air. "Perhaps," she thought,

"I can kiss it well again, the way mother kisses my bumps well." Then began the funny smacking noises—little healing kisses to the air. The habit became automatic. It continued long after she had forgotten the reason.

Many of these twists and peculiarities of children are probably due to conditioned reflexes; and from our present point of view we can see how frequently such reflexes and inhibitory associations may be the cause of misconduct, or what is interpreted as such by the overzealous teacher.

The incident related by Betz mentioned below in Chapter XIX (p. 619) is an excellent example of the way in our ordinary activities conditioned reflexes may be set up of which we are quite unconscious but which later on modify our behavior. When we recall that all of the time in our daily activity, incidents of interest and excitement sufficient to make more or less permanent associations occur, we see how profoundly these associations may influence our action and our characters. In many cases a child's behavior that calls for discipline is the result of such a conditioned reflex of which he is quite unconscious. Many a child has been punished for smiling at the wrong time when quite innocent of any intentional wrongdoing and the only evil connected with the smile was that in the mind of a suspicious teacher.

Years ago Horace Mann cited the case of a pupil whose nerves were strained to the breaking point under the rigorous discipline of the schoolroom, who finally whistled automatically just as an adult might sigh automatically. As he relates the incident:[4]

Just as a certain school was closing, one afternoon, a boy named John, who had become almost crazy with impatience, and in whom the steam of discontent had risen almost to

the exploding point, whistled outright. "John," said the teacher, "was it you who whistled?" "No, sir," says John. "Henry," says the teacher, "didn't John whistle?" "Yes, sir," says Henry. "John," says the teacher, "how dare you say you did not whistle?" "I didn't," says John; *"it whistled itself."* Now, in this case, if John were to be punished at all, he should only be punished so much that it would not whistle itself, the next time.

Many cases of discipline are of this kind. Children do forbidden things automatically. Naturally enough, they deny that they do them. Even when the behavior is conscious the pupil may be perfectly innocent. In a school where the rule forbade eating in school hours, a little girl in the third grade noticed a thread on her dress, picked it off, and put it in her mouth, naturally enough chewing it a little. Her neighbor, not old enough yet mentally and morally to have a normal horror of tattling, told the teacher that this girl was eating. The teacher questioned her; the pupil said she was not eating. Actually, she never thought of the thread that she had put in her mouth. Between the tattling pupil, the pedantic teacher, and the normal pupil chewing a thread, it is not difficult to balance the scales of justice. Such misunderstanding is common.

3. *Defense Reactions.*—Of the mental causes of misconduct one of the most common perhaps is a sense of inferiority and an attempt to compensate. As Miss Blanchard has pointed out,[15] "the attempt to compensate for the feeling of inferiority may be by means of assuming the leadership of gangs and unruly organizations, and by expressing defiance of authority. It is indeed a distinction to be notoriously bad and thus to be raised from the realms of mediocrity." (p. 514.) Probably in many other ways this sense of inferiority causes mis-

conduct. This leads to the next cause to be considered.

Probably most of the conduct disorders in school which are not trivial and merely due to artificial rules, represent really defense reactions, some of them defensive reflexes like those studied extensively by Bechterew due to toxins from various causes, especially from abnormal and defective or unrelated functioning of the endocrine glands;[3] and many others are due to defensive reactions in the mental field where the child is suffering from fear or some other strong emotional reaction, or where in some way the child's personality is threatened by the behavior of the teacher or of the school as a social group. In any case the significance of conduct disorders as representing such defense reflexes is of the first importance, and though mental hygiene seeks first of all to prevent such forms of misbehavior by giving ample opportunity for the reaction of the pupils in legitimate and interesting tasks, on the other hand, where such defense reactions do occur in a way that represents misbehavior, it is the teacher's business to find out what the cause is in order that unjust punishment may be avoided, and also in order that the reactions themselves may be remedied, instead of giving discipline of a kind that merely means punishment of the symptoms. The negative attitude children often develop seems to be a defense reaction, and should be treated as such.

Unfortunately, the attitude apt to be developed by discipline is more or less a negative one, and this negative attitude sometimes is unfortunately exaggerated. I remember a child that constantly reacted negatively to her father. In the course of five minutes the child said "No" some twenty times to things suggested by the parent. Any suggestion by the parent was enough to arouse this negative response.

In such cases the analysis is simple. A prohibition represents the primary stimulus. Naturally enough, children react against prohibitions. Then, after many repetitions, the sight or the word of the parent or teacher becomes associated with the prohibition as an associated stimulus, and so every time the parent speaks the negative reflex occurs. What we have here is a conditioned defense reaction.

One of the serious forms of misbehavior in children is a defense reaction of some kind to fear—fear of teachers, fear of companions, fear of strangers, not infrequently fear of one's own parents, as well as the fears of imaginary or associated evils; and later on, fear of examinations and fear of failure. Patri notes that "I can't" from a child is apt to mean fear.

These fears are likely to be unknown to parents and teachers. Children are apt to be secretive in regard to them; and yet the wise teacher and parent may often discover them. The following is a simple case in point.

A teacher noticed that one of her new pupils would not look her squarely in the eye and was prone to mischief as soon as she was not watching him. So one day she said to the boy, "I know what is the matter with you. You are afraid of your teachers. Now I don't want you ever to be afraid of me." The boy admitted that he had always been afraid of his teachers and always watched them and attempted mischief when they were not looking. The boy talked the matter over frankly with his teacher, and thereafter she had no trouble with him.

The fears of children that are frequently the cause of misbehavior are often grotesque in their character. It is only as we see the origin of such fears that we can

make any sense out of them; but often by careful study a teacher can find out what they are.

4. *Inability to Face Reality.*—Another cause for misbehavior and punishment is the child's inability to face reality. Children are all sentimentalists, they are prone to substitute an imaginary world of things as they would like to have them for things as they really are. Barrie's "Sentimental Tommie," in his behavior, merely illustrates in large letters the tendency of every child to substitute an imagined world for the real world. This is the cause of misconduct far more frequently, probably, than most people suppose.

For illustration, take one of the inevitable and innumerable accidents of childhood. A child, for example, places a lighted lamp too near a valuable mirror. In a few minutes the glass is shattered by the heat. He was blameless because of lack of experience, but the result was none the less fatal. To the child, however, it was incredible. A moment ago the mirror was there with its beauty and its magic, now it is nothing but a chaos of shattered glass. The child is heartbroken, he cannot face the reality. He knows, too, that he did not do it by any intent of his own. It was the last thing in the world he would do. It was done by evil fate or something outside his own power, and, when asked about it, says naturally that he did not do it, tells a lie, as would commonly be said. Such an accident may be the occasion for training of the utmost value in facing reality, or it may be the occasion for the beginning of an unfortunate habit of hiding one's face from facts and running away from difficult situations.

Again, sometimes this inability to face reality may be combined with a dawning sense of honor and unwillingness to tell tales. One's playmate has an accident, and

the child feels that his companion did not do the unfortunate act intentionally; and so, when asked about it, he says that his companion did not do it. To analyze the child's state of mind might be difficult; but in children, as well as in adults, a combination of impulses may be the determining cause. Thus not infrequently, perhaps, the inability to face reality may be combined with other impulses.

5. *Mental Conflict.*—A frequent cause of conduct disorder is a mental conflict of some kind. Healy's studies and long experience have shown this clearly.[9] He estimates that 10 per cent of young delinquents are suffering from mental conflict. Healy also reports that where the child has been able to tell the examiner the story, the delinquency and nervous trouble have disappeared. The minor conduct disorders of the schoolroom are probably quite as often caused by mental conflict of some kind.

The conflict may be connected with a sense of inferiority. A child becomes conscious of some defect and may strive intensely to cover it up. For example, a child, Adler suggests, may become conscious of having a weak will, strive constantly to overcome it, and thus obstinacy results because the child does not dare to give up what he has once undertaken to do, lest it show weakness. In other words, obstinacy is an overcompensation for a defect of the will.

Such are some of the common causes and those less frequently recognized for the misconduct of children in school and in the home. The knowledge of these causes helps greatly to prevent occasions for discipline.

6. *Lack of Tact in Teachers.*—Another cause for the misbehavior of pupils may be the teacher's attitude. In many cases, if the teacher expects the children to behave

well, they will do so. On the other hand, if the teacher expects them to misbehave, they will not disappoint him. An attitude of suspicion and distrust on the part of the teacher and the constant watching of pupils are apt to suggest breaches of discipline; and often unconsciously the misdemeanors thus are caused by the teacher's tactless attitude.

Sometimes conscious effort is made by pupils to meet all expectations of misconduct. If a teacher is looking for trouble, he will find it. If either naïvely or consciously the teacher ignores the prospect, he may escape. A young teacher some years ago opened a rural high school with fear and trembling, because among the pupils were two adolescent girls who were bubbling over with vitality and potential misbehavior, and who, as he knew, had made chaos in the school under another teacher the term before. He was determined there should be order, and, thanks to some kindly Providence, he decided to begin by treating these girls as young ladies and as if he expected them to behave as such. They proved to be among his best pupils. The teacher heard afterward that before school opened they had agreed that, if the teacher watched them, they would behave as badly as they could; if he did not watch them, they would behave as well as they could.

7. *Excess of Punishment and Exhortation.*—A multitude of cases of discipline arise because teachers take the responsibility for good order in the school instead of putting the responsibility on the children. Observation and special study of children alike show that they usually like a teacher who keeps good order, but their attitude is that this is the business of the teacher. Why should they mind to keep good order if the teacher does not require it? Why should they take any responsibility

for the discipline of the school when that is the teacher's work? On the other hand, where the responsibility for the order of the school is placed on the children, then excellent results are likely to occur.

There are, of course, plenty of other causes of misdemeanor in children, many furnished by parents and teachers themselves, the failure to give children enough to do, lack of the infinite patience needed for training, lack of the time necessary, and, most pathetic of all, the failure to understand children, a failure so vividly and concretely illustrated in Booth Tarkington's stories. Let me mention one other.

One of the causes for misdemeanors and the occasions for discipline is the very fact that we blame and punish so much. As soon as it becomes a common thing to blame and punish children, we are sure to make mistakes and sometimes blame and punish unjustly, and, further, the practice of continual punishment soon dulls the feelings so that more severe punishment is necessary to have an effect.

Some 300 years ago, one of the world's teachers, the great Moravian whose memory is revered not only as the patron saint of the new republic of Czechoslovakia, but as one of the greatest of educators, to whom we repeatedly refer—Johann Amos Comenius—gave the soundest teaching in regard to the discipline and training of children.[6]

He recognized that the significant thing is the psychological effect of punishment and emphasized the need of producing a right perspective, giving only slight blame and punishment for slight offenses and more severe punishment for grievous offenses, and really severe punishment only for the most grave misconduct. He suggested also the evil that comes from punishing too severely for

slight misconduct and from continually blaming the children. Applying his doctrine from a psychological point of view, it is easy to see that with the severe reproof and punishment given by some teachers and parents for slight offenses, it would be necessary to hang a child for a fault like wilful disobedience and spiteful behavior in order to produce the right moral perspective.

With the severe punishment usually given, it is impossible to punish properly for grave faults simply because the psychological effect of punishment has all been expended on the minor offenses. Of course, the practical rule is to overlook altogether all offenses that can be safely overlooked, and in reproof and the like to use as few words as possible and as slight punishment as seems permissible for the training of the child in regard to the particular offense in question.

The words of teacher and parent, especially words of blame, are apt to be significant inversely as their number. Children become hardened by continued repetition of exhortations and the like, and they discount the words of the teacher to the full extent justified by the psychological law of the diminishing intensity of feeling. Parent and teacher are placed in a difficult dilemma in the training of the young. Only by repetition, by line upon line, and precept upon precept, here a little and there a little, is it possible to give that detailed training necessary for proper nurture of the young, just as Carlyle said that there are only three figures of speech, the first repetition, the second repetition, the third repetition; so in the case of the child the three significant rules for training may be said to be repetition. And yet, on the other hand, children, like adults, soon weary of what is repeated, and the end of such training is

likely to be failure by the teacher and disgust in the pupil.

It is much the same with parents. As to the boy's feelings, they are expressed by Eugene Wood:

> Don't you care. It's just her talk. If it isn't one thing it's another, cleaning your shoes, or combing your hair, or brushing your clothes, or using your handkerchief, or shutting the door softly, or holding your spoon with your fingers and not in your fist, or keeping your finger out of your glass when you drink—something the whole blessed time. Forever and eternally picking at a fellow about something. And saying the same thing over and over so many times. That's the worst of it!

Miss Arnold used to tell a story that carries its own moral. A mother calls loudly to her son intent on his play. The boy pays no heed. The mother calls again and again. Finally, the boy answers: "Oh, ma! do you really want me or are you just hollering?"

Preventive Discipline

According to common opinion, discipline is an essential condition for the efficient performance of tasks. It is equally true that the earnest performance of tasks is an essential condition of discipline. Most cases of misdemeanor would be prevented if children were given a sufficient opportunity for the performance of worthwhile tasks; but many occasions for blame and punishment may result from the extreme individualism of most parents and children. In this country our school work puts a premium upon individualism, for the most part appeals to the spirit of rivalry, and tends to make each child think first of all of himself and strive for his own special advancement without thinking much about others.

From this it has come to pass that most children are extremely sensitive, have an undue self-consciousness, and resent everything that appears to them as in any way indicating injustice. This is especially true of children in relation to any form of blame or punishment.

As human nature is, and as human behavior has appeared in schools for centuries, the strong, vigorous, and normal pupils are apt to domineer over the weak and mentally defective; the strong, in popular language, "pick" upon the weak, and so cases of injustice and injury occur. The weak pupils are all likely to have grievances; and the most serious work of the schools becomes then a matter of discipline. On the other hand, if the pupils were organized into coöperative groups, the interest would center upon the group activity, the strong would no longer pick upon the weak; or, if they did, the group sentiment and public opinion of the group would at once punish the offender, and the grievances would tend to disappear in the interest of the group.

Futility of Ordinary Methods.—The following concrete example from a rural school is banal but instructive just because it is typical of what occurs in a thousand schools. It came to the writer's attention recently while spending a vacation in the country. This school had a small group of pupils and a good, sensible teacher. A fourteen-year-old boy, probably defective, in any case several years retarded in his school work, got into trouble with the other pupils, the sequel of a long story of friction with pupils and teacher. The boy fought with another pupil; the teacher shook him; the boy became hysterical; appeal, of course, was to the parents, who maintained that their boy was treated unjustly. "What made me so mad," said the father, "was that my boy was licked and the others were not." The parents re-

fused to send their children to school. The school board graciously granted a hearing. The father was asked to state his complaint. By the space of one or two hours he did so. The members of the school board, busy men and women, at a busy season of the year, devoted a long evening to this special meeting to hear the complaint of this one parent. The outcome was a truce, weariness of the school board, disgust in the teacher, threatened disruption of the school, but relative peace for the time being.

Here we have on the part of the child and the parent an exaggerated feeling that injustice has been done. Now if we reflect for a moment, it is only omniscience that can determine what would be even-handed justice in a situation of this kind; and, lacking omniscience, we have a muddle of errors when attempt is made to determine justice; first, the errors of the teacher in regard to what really happened; second, the errors of the boy punished in regard to what happened; third, the errors of the other children in regard to what they saw; fourth, the errors of the parents in regard to what justice should be, and so on. In such a case, perhaps, only the school board in a rural community of a democratic country would make any attempt to solve this tangled problem of justice. The case is merely an illustration of the futility of ever attempting to determine what would be ideal justice in a situation where it is impossible to get all the facts; and most situations calling for discipline are of this kind.

Advantages of the Coöperative Group.—Such cases, which occur in hundreds of communities, represent in the child the beginning of mental disorder, are the torment of the teacher's life, take the time of school officials, and could, in most cases, be averted if concrete

methods of coöperation were employed in the school work, instead of our methods of extreme individualism that put a premium upon self-consciousness and sensitiveness to personal injustice, and if the pupils were kept busy in fitting tasks. Bagley gives this example.[1] *

> The "best disciplined" school that the writer has ever seen was in charge of a principal who had worked for six years to make the collective will of the pupil-body give its sanctions to good order, courteous behavior, and aggressive effort. . . . The spirit of the social group seized them irresistibly. The social rewards which in other schools sanctioned disobedience, wilful disorder, and idleness, went in this school to more laudable types of conduct; and the normal boy, craving the good will and the admiration of his fellows, sought these prizes through the only means that could procure them. To this school, also, teachers who had failed elsewhere were sometimes sent in order that they might regain their self-confidence and find themselves anew under the favorable conditions there existing. Not all of the recalcitrant pupils, of course, succumbed to the powerful group influence; and not all of the teachers were able to undo the mischief of their earlier failures; but the mortality in both cases was surprisingly low.

Here, too, the method of prevention can be used with advantage. By proper group training and the doing of group tasks a social spirit like that described by Bagley may be developed, and wholesome group interests aroused, which may be trusted for the most part to prevent the need of discipline or furnish the necessary punishment if misconduct does occur.

Punishment Merely First Aid.—Punishment, as some one has pointed out, should be looked upon as first aid, not as a permanent cure. The most effective and drastic

* From W. C. Bagley, *School Discipline.* Reprinted by permission of the Macmillan Co., publishers.

punishment is that by one's peers in a social group. Thus Puffer points out the effectiveness of punishment inflicted by members of a group upon one who has violated some rule of the group. As one writer has expressed it, "When punished by your teacher, you are a martyr in the eyes of your fellows; when punished by your fellows, you are a disgrace to their community." Usually, as Healy maintains, what is needed is not punishment, but understanding.

Rules For Discipline.—Although we know little about the whole subject, one or two rules in regard to discipline have been pretty well established by the experience of millions of teachers and parents.

The most important of these, perhaps, is in regard to obedience.

This is the one social virtue that should be inculcated in early childhood. From a psychological point of view, provided obedience be taught in regard to a few things, there are only two rules of prime importance in the education of young children: let them alone and set them a good example. On these two commandments hang all the law and the prophets as far as early pedagogy is concerned.

If one is not reflective, this seems easy. If one has thought the matter over, it appears infinitely hard. In the first place, it is extremely difficult to let children alone. We all have the feeling that the least we can do is to interfere; and in matters of morals and manners the issues at stake are so tremendously important that we feel that we should interfere as early as possible and as frequently as possible. The result of all this is apt to be either, on the one hand, premature development and unrelated precocious acquisitions; or else, on the other hand, dulling of feeling, so that the words

and advice of parents and teachers have no influence. As already suggested, the best of discipline can be given in connection with the task itself.

Children should be trained to realize that some tasks are imperative and that they must be done at a definite time. This training can be given in the ordinary occupations of life. Such tasks are dressing, going to school at a definite hour, getting a street car or the railway train at a definite time, and the like.

Mental Hygiene Necessary for Proper Discipline.—It is not, however, altogether easy to give proper training to children in this fundamental virtue of obedience. A great deal of common sense and a knowledge of mental hygiene are necessary in order to give such training without doing harm. This can be made clearer by concrete illustration—a newspaper story of a girl in our public schools. It has all the earmarks of a true story; but, whether literally true or not, it serves well for illustration.

Madeline, twelve years old, was attending a public school in one of our large cities a few years ago. In the paper-cutting lesson she snipped out—not, it would seem, wilfully—something that made her schoolmates laugh. Her teacher demanded that she should apologize, and, when she refused, bade her stand in the corner with her face to the wall until she could bring herself to do so. Madeline replied that the apology was due from the girls who had laughed without good cause, but she betook herself submissively to the corner. The end of the lesson came, but not an apology from Madeline. Nor did the lightly laughing maidens profess repentance, since none required it. The teacher was a disciplinarian of the stony sort, and for four weeks Madeline occupied her place in the corner during six hours out of

twenty-four, or *about a hundred and twenty hours in all.* The blood of the Pilgrim fathers was in her veins —she could stand, but not apologize. At last her mother resolved to take her from school, fearing that standing in such a way would injure her health. But Madeline is still firm, and this is how she looks at the matter: "It isn't that I am stiff-necked or stubborn, but that I know I am right—and when a girl is right she should not cower before any one or apologize for what she has not done." Recently the girl's mother was summoned to court on a complaint of the truancy officer. She told the judge that she had no explanation beyond that given by her little girl. The judge, learning that the school authorities had suspended the rebel, decided, that, in these circumstances, she could not be a truant, and dismissed the case.

From our knowledge of mental hygiene we can interpret a case of this kind. Madeline was either a girl with unusually strong mind and strong will, to use the popular phraseology, or she was a more or less pathological case with a weak will and what Adler would call overcompensation resulting in obstinacy.

If Madeline was a normal girl with strong will, probably the experience did not harm her, and perhaps she was all the better for it, having attained the success which comes from self-assertion in a righteous cause. If, on the other hand, Madeline was pathological, she required special care.

The chances are that Madeline was normal and had a strong will, that the teacher was really the one who had a weak will, and that her continued insistence upon obedience was due to her weakness in feeling that to give up and change her tactics would mean failure and the weakening of her authority. But, in any case, a little

knowledge of mental hygiene would have saved this teacher from an unfortunate and humiliating situation and perhaps from doing grave injury to the child.

Training in obedience is a great aid to a child's mental serenity and healthful mental development. It should, however, be adapted to the peculiarities of the individual child and to the special situation where obedience is required. Otherwise the training may do harm to the pupil and be the source of chagrin to the teacher.

Blunders in Discipline.—Some one should study punishment and discipline from the point of view of the conditioned reflex. The punishment of a child, especially perhaps the first time one is punished, is a serious crisis. A violent punishment is liable to be the strongest stimulus the child experiences in the early years. It is not strange that conditioned reflexes are likely to be formed by the varied stimuli associated with this drastic adequate stimulus.

The training of animals is instructive. Our horses and dogs are often ruined by our errors. If you would train your dog to run away from your chickens, you must associate the sight of the chickens as the conditioned stimulus with an adequate disagreeable stimulus. If you punish your dog with a stick because he chases the chickens, the danger is that you yourself will become associated with the punishment as a conditioned stimulus and not the chickens; that he will run away from you and still run after the chickens. Thus punishment of your dog by an electrical apparatus or the like is better than punishment inflicted by the master with a stick.

Plenty of good dogs are spoiled by blunders in training. Remarkable results can be obtained by a trainer who adopts a right method and makes no mistakes. The

ruin of the dog is easily accomplished sometimes by a single blunder. Fullerton, who seems to have had unusual success in training his dogs, even accomplishing results that suggest real moral training, reports two cases. One was of a dog he persuaded by entreaties and kind words to eat a pickle, in spite of the dog's dislike for such condiments, for the sake of pleasing his master. To another dog, who was in the habit of catching in his mouth morsels of food thrown by his master, one day he threw a pickle. The dog caught it, received the disagreeable taste, and the conditioned reflex established by this single case of shock was so permanent that thereafter Fullerton could do little or nothing with him in the way of further training.

Plenty of children, in like manner, become the victims of unfortunate conditioned reflexes established on occasion of physical punishment, or what for the child is often a still more bitter punishment, sarcasm or the like. In the case of the horse or the dog we say the animal is ruined by the training, in the case of the child we are apt to say he is unruly, feeble-minded, or defective.

Illustrations of the permanent effect of punishment unfortunately are too common. Every teacher of extended experience probably is familiar with such cases. A classic example was cited by Horace Mann,[4] "the story of Dr. Bowditch, who came near to being inhumanly punished for an alleged falsehood, because he said he had solved an arithmetical question, whose solution required more talent than his tyrannical master supposed him to possess. Late in life, that great man spoke of the event in a manner which showed that, after the lapse of half a century, the feeling of righteous

indignation towards the teacher was still vivid in his breast."

Punishment May Mean Opportunity.—On the other hand, punishment and discipline represent opportunity; and failure to use the rod when needed may also spoil the child, as tradition has taught. From the point of view of the conditioned reflex we see that the results of punishment either for good or for evil are not altogether matters of right-mindedness or perversity on the part of the child, but rather of deep-seated reflexes of the nervous system and the primitive emotional reactions reenforced by the iron laws of association.

Conditioned Reflexes and the Teacher's Influence.—Although we may not know it, discipline is a systematic attempt to establish conditioned reflexes adjuvant to learning, health, and mental development. Unfortunately, in the school the emphasis is apt to be placed wrong; consciously or unconsciously, the end attained by the discipline of the ordinary school is often the establishment of conditioned reflexes inhibitory to spontaneous behavior, direct, straightforward thinking, and to a multitude of concrete activities, normal enough in themselves, but forbidden by the code of the school. Usually the attitude developed is negative rather than positive, an attitude of repressing certain impulses rather than of suggesting certain tasks.

In the school as a group, a strong teacher naturally represents the most important personal stimulus. The influence of the teacher in forming significant conditioned reflexes and developing mental attitudes in the pupils presents a problem of the utmost importance from this newer point of view. A thoroughgoing study of the influence of the teacher in this respect should be made.

Discipline Methods

In any institution like the school or the army, the aim is to make discipline efficient; the result is apt to be that it becomes mechanized, artificial, and dead from lack of the human element. It is just because a teacher expresses righteous indignation or disgust at wrong-doing or slacking, and enthusiastic commendation of good work, that discipline is effective and wholesome.

A friend of mine in the discipline of her children used to aim at even-handed justice free from any emotional bias; and in case of punishment talked it over with her children that they might see the reason for it. One day her boy argued that the punishment proposed for a certain misdemeanor was unjust, and she could not convince him.

Falling back upon an ordinary human reaction she said: "Well, I am going to punish you anyway, and you can set it down to revenge." This instinctive emotional reaction the child understood, and was satisfied. Although discipline should be governed by reason, probably in most situations, a child understands instinctive behavior better than reasoned argument.

As the teacher, as well as the parent, is usually placed in the dilemma of dehumanizing discipline by an elaborate code of rules or of making it sentimental by impulsive action, the wisdom of preventive discipline is again emphasized. This preventive discipline, together with the training given by other children in a group is so important that, with healthy children who have not been badly trained by their own parents, little in the way of positive discipline is usually necessary.

Contrasted Methods.—Two methods of education differ by a hemisphere—in terms of the old theology they

are as wide apart as heaven and hell. They may be called the active and the passive methods, or the negative and positive methods; they involve, on the one hand, the spirit that suggests and encourages, on the other, the spirit that denies; Carlyle's eternal yea on the one hand, his eternal nay on the other; the method of Satan by which a man is damned because he does wrong, and the method of Jesus, according to which a man is damned because he does not do right.

It is the tragedy of human education that parents and teachers, with the best intentions in the world, disciples of the great master, should so often unwittingly fall into the method of negation. This is done, not merely by unnecessary interference, by prohibition, and repression, but still more seriously, perhaps, by denying opportunity, by always doing for children instead of giving them the chance to do for themselves, by giving no responsibility, and, worst of all, perhaps, by suggesting to children that they are not able to do things. Every child is lazy, every child is tired, every child, in regard to certain things, is a slacker. It needs but little aid from parents and teachers to make this attitude permanent. In one concrete case of this kind, where parents did too much and the child was not given responsibility and encouraged to do things for himself, the child made this attitude his defense and protection. When urged to do a thing in caring for his own toilet or the like, he would reply, "I can't do this, mamma says I can't."

Two fundamentally different methods of discipline are used. One forbids wrongdoing, clearly, definitely, concretely. It aims to make regulations and prohibitions so concrete and explicit that a child may never be uncertain what to do. For wrongdoing it punishes

promptly, surely, unflinchingly, justly. This ideal makes no compromise with evil. Rules are carried out uniformly, impartially. They are like the law of the Medes and Persians that altereth not. This ideal aims to take no risks.

It is the Prussian method of discipline. Everything wrong is forbidden. Instead of directions how to go and what to do, they put up signs of things *verboten*, forbidden. As Brand Whitlock has described the extreme form of this method,[22] "instead of barking a few trees to blaze the trail, they would hack all the trees in the forest except those along the way they wished to indicate."

The irony of all this overcareful and pedantic care of children is amusingly emphasized in the result that often occurs; the rules and regulations of the parent or teacher afford the most natural opportunity for self-assertion by the child; and apparently sometimes the chief opportunity for distinct social success comes in breaking the rules and defying authority. Thus in one school of which I have a report, the pupils made it a point of public duty to break all the rules of the school each day, and counted that day lost when they did not succeed.

This method, however, appeals to a large class of educators. It seems easy; it gives definite results of a certain kind. It means, in a certain sense, efficiency, order, justice. Nevertheless there is a more excellent way.

According to the second ideal and second method, it is recognized that moral development comes only by taking moral responsibility and by an individual's own moral self-activity. It recognizes that self-control, moral effort, and moral judgment in new situations, and moral

decisions in a child's own problems, are worth more than any moral performance by the teacher or parent or any code of rules and regulations. By this method responsibility is placed on the pupil, and a child is told what to do rather than what not to do.

The Hygienic Method Difficult.—There is always a tendency to the Prussian method of discipline because it seems easy and the result is apt to be spectacular, whereas the method that consists in training the individual child in his own self-regulation and that puts responsibility on the child for his own behavior, is a slow and difficult method, and there are sure to be many slips and failures before a child learns self-control and self-regulation. By the Prussian method, the youth goes out with moral crutches; by the hygienic method, with moral nerve and muscle.

The Principles of Discipline

If a child be trained to realize that some tasks are imperative and to obey in a few things, if a child be made responsible for his own behavior, and if the method of preventive discipline be adopted, then the other general principles of discipline may be briefly stated.

1. The first principle of discipline is, of course, adaptation of the training to the physiological and psychological age of the individual pupil.

2. The second is that discipline should aim to develop social qualities, the spirit of coöperation, group loyalty, and the like, as well as individual character.

3. The discipline of the pupils should appeal to the highest available motive normal for the given stage of development. This may very well be illustrated somewhat in detail.

Discipline usually involves the sacrifice by the child

of individual interest and certain individual desires in a given case. The school child may be induced to give up his own personal wishes by any one of a number of motives. Among the more common are these: the desire for some reward, or the like, fear, love, the desire to please the teacher, the parent, or some one else. Or the pupil may give up his personal interest for the sake of the school as a social group. He may conform to the rules of the school out of loyalty to the group, that it may stand well as a good school, as well organized or the like. Again, the pupil may give up his own interest and yield obedience because he thinks it will develop his own character; or he may give it up because he thinks that such a sacrifice will tend to develop good citizenship and patriotism; or finally, he may yield obedience to the discipline of the school from an abstract sense of right and wrong.

Obviously, there is a great difference in the quality of these motives available. The motives of fear and desire for personal reward have their place, but they are low motives. The motive of yielding obedience for the sake of the teacher or the sake of the parent are altruistic motives, but still they are not of the highest order. Although much of the discipline of the school consists in gaining obedience of this kind, a higher motive is that where the pupil yields obedience for the sake of the school as a group. In the lower grades this probably is the highest available motive normal for that stage of development.

Although the motives that lead to personal self-sacrifice for the sake of good citizenship or abstract notions of right and wrong may be appealed to in the higher grades, it is a question whether such motives in the lower grades do not represent a precocious, prema-

ture development which is apt to be in some degree abnormal if not pathological.

4. If another general principle may be added, it should emphasize the complexity of the problem of discipline in each individual case. The solution varies with the different factors involved.

Thus, as our survey shows, a great part of the occasions for discipline and punishment may be avoided by proper care for the health of children, by making the schoolroom and home surroundings hygienic, by avoiding needless occasions for friction, and by adapting the work and study to the individual's peculiarities and stage of physical and mental development. Much more than this, however, can often be done in the way of preventing occasions for discipline and punishment, especially in the public schools, by organizing the tasks of the school, and, in many cases, those of the home as the occupations of a coöperative group.

Maxims.—Discipline is thus bound up with many other matters in a child's training—health, success, fear, interest, power of initiative, physical and mental energy, and the like. Largely, discipline will take care of itself if children are merely trained to obedience in a few things and then given the stimulus of success and the opportunity for developing interest in wholesome and legitimate activities. The maxims are much more fundamental and positive than those in regard to mere punishment, some of the more important as follows: Give a child opportunity and responsibility. Do not do for a child what he can do for himself Give a child opportunity to develop many interests. Protect from fear, but train to meet difficult situations, and, as far as possible, the objects of fear. Finally, let the child

alone. If you must do something and can think of nothing fitting, set him a good example.

It would be easy to give a number of important negative rules and warnings. These can be formulated, however, by each parent and teacher. If a code readymade is desired, the following is approximately sound: do not blame children; do not argue; do not talk; do not imagine that you understand the child; do not make rules; when you really do not know what to do, don't do it.

Summary

Discipline, even in the narrower sense, is not primarily for the sake of making the work easier for the teacher, nor even merely for insuring good order in the school, nor for the sake of efficiency in school tasks; but it is rather an opportunity and means of training for the individual pupil. Although the study of the subject from the point of view of psychiatry and mental hygiene has only begun, a few points seem well established, among them the following:

1. The causes of conduct disorders of the graver sort, those liable to legal punishment or correction, are in large part due to arrest of mental development or to mental defect—physical or mental disorder of some kind—or to lack of early training.

2. The causes of the usual misconduct in the school are many and often complex—on the one hand, ill health or physical defect and the mental twists due to inherited peculiarity or unfortunate attitudes, conditioned reflexes and habits, faults, or inhibitions of some kind, that the pupil brings to school; or, on the other hand, to fears, unfortunate associations, inhibitions, and wrong atti-

tudes, due to maladjustment from school conditions, including the personality and methods of the teacher. For the greater part, all these conditions in the school can be prevented.

3. Hence the great aim in school control is preventive discipline.

4. The great means of preventing misconduct is the providing of suitable tasks.

5. Pupils should be trained to realize that some tasks are imperative and to yield obedience to proper authority.

6. Pupils should be made responsible for their own behavior.

7. The stimulus of the group and social sanctions, when available, are usually better than individualistic motives.

8. In applying all principles and methods, the genetic method should be used, adapting the discipline to the physiological and psychological stages of the individual's development.

9. The highest available motive normal for a given stage of development should be used.

10. The aim of discipline is the development of morale—desirable conditioned reflexes and habits, social interests and responsibility, and healthful mental attitudes.

11. Although discipline from the modern point of view is positive rather than negative, and though the rules of mental hygiene for teachers are suggestions for performance rather than prohibitions, hygiene is no less emphatic than common sense in condemning methods of discipline that have sometimes been employed in the schools—severe and cruel forms of punishment, prolonged punishment, and obviously unhygienic meth-

ods of punishment, liable to do physical or mental injury, such as boxing on the ears, that has sometimes had fatal results, spanking that sometimes produces a pathological conditioned reflex of sexual character, and punishment that interferes with the physical needs of the body; and mental punishment by blame, nagging, sarcasm, degrading one's personality, especially blame and punishment likely to produce permanent fear, attitudes of rancor and resentment or of timidity and inferiority, unfortunate associations, and inhibitions of normal associations and will impulses.

12. In the light of our war experience and the modern study of psychiatry, the need of a thoroughgoing reconstruction of the discipline of the schools from the point of view of morale and mental hygiene is strongly emphasized.

13. Nowhere is the aid of mental hygiene more needed than in school discipline. It shows that the function of discipline is positive, not negative. Just as the aim of school hygiene is the prevention, rather than the cure, of physical disorder, so the aim of discipline is prevention rather than the cure of conduct disorders; and just as with our modern knowledge of child hygiene, if the school nurse finds a school child physically ill, her first duty is to find out the cause, so if the teacher finds a child guilty of misconduct, her first duty is to find the cause.

14. In its positive function the discipline of the school affords opportunity for training of the utmost value for healthful mental development. Discipline without regard to the teaching of hygiene, however, is liable to do the gravest harm. Neither is school discipline merely for the few, the unusual, and the unruly. On the contrary, it is for all the children; and the normal as well

as the defective should be given the aid of mental hygiene.

Problems and Questions

1. What are the most common causes of misconduct in the school?
2. Fernald thinks that conduct disorders in the feeble-minded are often caused by a sense of inferiority and the desire to do something unusual as a compensation. Is there evidence of similar cases in the normal?
3. What, according to your observation and reading, are some of the defense mechanisms resorted to by children when they feel guilty?
4. What are some of the advantages of punishment as first aid to the mental health?
5. Report any cases you know of evil results from punishment.
6. What are the advantages and disadvantages of corporal punishment in the schools?
7. What results have you observed from the use of sarcasm as a means of punishment?
8. Report cases of the effect of the condemnation of one's behavior by the opinion of the group and one's fellow students.
9. What methods and devices for preventing the need of punishment can be used?
10. Describe the method and results in any schools you know where the pupils are made responsible for their own conduct.
11. How is punishment used with good results in the training of animals? Report cases where animals, dogs for example, have been spoiled by unwise punishment in the course of training.
12. What opportunity for the development of morale is afforded by the means of discipline in a social group like the school?

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CHAPTER XVIII

PSEUDOFEEBLE-MINDEDNESS

MANY years ago, when I had reached that stage of scholastic omniscience supposed to be characteristic of the high-school graduate, I was deemed competent to teach a rural school in New Hampshire. Among my pupils were George Washington . . . and Thomas Jefferson. . . . The burden of their names was about all they could carry. The only examination they could possibly have passed was what a little girl recently called "the idiot examination." George Washington . . . was perhaps a high-grade imbecile, Thomas Jefferson . . . a low-grade moron. I knew nothing of the proper training for such children, but made a futile attempt to teach them to read and write and figure. It was useless, however, to attempt to make George Washington a statesman, or Thomas Jefferson a school teacher, although possibly some morons are in the teaching profession. It would have been possible, however, to make George Washington happy by teaching him weaving or the like; and Thomas Jefferson could probably have been taught to saw wood, and perhaps to make boxes, and drive horses. If George Washington is alive to-day, he is still mentally only five or six years of age. If Thomas Jefferson is living, he is only eight or nine years of age.

We know now that by giving such feeble-minded children tasks suited to their mental age, they can be made happy and often useful. We know also that by

no pedagogical device or method is it possible to add a single cubit to their intellectual stature.

Recognizing that such individuals must always remain children, we now give them in institutions and, to those of higher grade, perhaps, in special classes, that training necessary to make them as efficient as possible; and since it is impossible to develop them to a higher stage, we are content to make them as happy as possible as children, thus by necessity and by our psychological knowledge recognizing the principle of the great Schleiermacher that we have no right to sacrifice any one period of development to another.

Of Seguin,[19] the pioneer in mental hygiene, it was said that he was not interested in any child unless it was feeble-minded. Mental hygiene has not lost its interest in the welfare of these children with arrested development though now it emphasizes mental health of normal children.

On feeble-mindedness and the levels of intelligence there is now a vast and easily accessible literature. To discuss this subject at length is unnecessary. It is well, however, to consider certain mental conditions common among normal people that in many ways show symptoms similar to the characteristics of arrested mental development. Since all of these are in large degree preventable, they are the special concern of mental hygiene; and the methods of cure for such conditions are themselves instructive.

The Stages of Development

A child's first business is to grow.

If heredity is favorable and physical growth and mental development continue healthfully for eighteen or twenty years, we call the individual a normal adult.

The process of mental development stops sooner in some individuals than in others. If heredity is bad, it may stop at the psychological age of one or two, and the individual is an *idiot;* or it may stop at the age of five or six, and the individual is an *imbecile;* or it may stop at the age of ten or eleven, and the individual is a *moron.*

The development of such feeble-minded children is usually fixed by heredity. They may be educated to the highest capacity for their psychological age, but further development is impossible.

All this seems simple. This is substantially the way the matter is presented in the textbooks. But things relating to human development are not usually simple. Although the mind is one, the mental processes are many. The development of certain functions in an individual may be retarded or arrested, and the development of certain other functions continue. No individual has complete development, but if the general development is normal, the weak development of some functions is compensated by the development of others and by education. If not compensated, or if made worse by the inhibitions of faulty education, the individual may resemble the feeble-minded in certain respects.

Thus some children by physical disorder or bad education or narrow environment may simulate feeble-mindedness. Such may be called pseudofeeble-minded, a loose term justified by our present ignorance. When we can more definitely describe the different defects included under it, it may be discarded, but it is convenient now.

Almost everywhere in nature we find counterfeit organisms and counterfeit forms of behavior. In medicine, for example, we have the pseudodiphtheria bacillus,

pseudoangina pectoris, and even simulated forms of defect, such as psychic deafness, that is, deafness where there is no physical defect of the organs of hearing, but where the psychic factor necessary for the perception of auditory impressions has never been developed. This is especially frequent among normal children of deaf-and-dumb parents, children who have never had the opportunity of hearing spoken language.

In like manner we may use the general term, pseudo-feeble-mindedness, for a number of arrests, inhibitions, defects, and disorders that in some respects resemble feeble-mindedness. As a matter of fact, we meet them everywhere in society and in the schools. In some cases the simulation is so great that it is extremely difficult even for an expert to decide whether the given case is the real or the counterfeit form.

Tested by the ordinary methods, these children do not appear normal. Something is wrong. Their temper does not ring true, they are like the pseudocounterfeit half dollars once sent to the Secret Service Bureau for testing. On account of a crack in the making, the air had been let in, and they gave forth the sound of lead but really were made of genuine silver, as shown by the tests of the Bureau. In like manner, adequate tests show that these children are not feeble-minded at all, but contain the true metal and merely require proper conditions and proper training for their development.

Let us note some of the different causes or conditions.

1. *Physical Defect.*—The first form is that of arrest of development due to some physical defect, perhaps unrecognized, such as an adenoid growth, or defective vision, or even, in rare cases, impacted teeth. Teachers are sometimes deceived by this form.

2. *Disease.*—Certain diseases may, at least temporarily, retard the mental as well as the physical development. A specially noteworthy example is that of the hookworm disease so prevalent in the South. It is a common thing for a child to be retarded two or three years by it. Millions of children in the South have had their development arrested by this disorder. This probably accounts in part for the large number of subnormal found among soldiers from this section by the psychological tests in the army, and also for many of the retarded children in the public schools in the South. Anderson reports from a survey of mental defectives in the State of Georgia, that, of 915 white school children and 120 negro children tested in typical schools, 37.7 per cent were retarded from one to six years mentally.[8] These retarded children were not feeble-minded, for he reports only 32 out of 915 white children as feeble-minded. The others were retarded for other causes; and probably a number were suffering from hookworm or some other disease, although this is not mentioned in the report. Studies by Strong and others have given direct evidence of a correlation between this disease and mental retardation.

A comparison in the report of the army records between a group of whites infected by hookworm disease and another group not so infected gives significant results. The records of 632 infected individuals compared with 5,615 not infected, gave results in part as follows:[9]

For 501 cases infected with hookworm disease tested by the Alpha test, the mean I.Q. was 94.38. For 4,792 cases non-infected, the mean I.Q. was 118.5. For 131 infected cases tested by the Beta tests the mean I.Q. was 45.38. For the non-infected 823 individuals, the mean I.Q. was 53.26. (pp. 84-85.)

The psychological examiners rightly give the following warning:[9]

> It is important, however, to guard against the assumption that data of this kind prove the existence of a causal relation between hookworm disease and mental inferiority. Low native ability may induce such conditions of living as to induce hookworm infection, or poor environmental conditions may be responsible for both the disease and the low test record (p. 86).

A sufficient number of those with retarded intelligence suffering from hookworm disease have been cured with remarkable improvement in the intelligence as a result of the cure to show that in many cases, it is not yet clear how many, a form of pseudofeeble-mindedness results from the effect of the disease.

Many other disorders, especially, perhaps, continued malnutrition, may also cause arrest of development.

3. *Fear.*—One of the most serious causes of pseudofeeble-mindedness is the inhibition of fear. This handicap of a chronic fear is probably the cause of the simulation of feeble-mindedness by many children. Unfortunately, we have no adequate studies here, but some physicians believe that many cases of epilepsy are the result of a shock of fear in the early years, and probably the chronic failures of many children of perhaps an emotional or nervously unstable type are due to this cause. Since these are apt to occur in the early years of life, not only the child himself but parents and teachers alike are likely to be quite unaware of what is constantly inhibiting the child's behavior. One case has been studied and described at length by Witmer, and, if his diagnosis is correct, the origin of the trouble was fear. The training of this child was so instructive and

the outcome so successful that the case is well worthy of study. The writer is indebted to Witmer for permission to describe this case somewhat at length.

Witmer's interesting story of the boy, Don, may be briefly summarized, partly in his own words.[25]

At the age of two years seven months Don responded to the mental tests like a feeble-minded child and was diagnosed as feeble-minded by competent experts.

> His father carried him into my office, and deposited him, a soulless lump, upon the couch. He sat there with the stolidity of a Buddhist image, absorbed in the inspection of a card which he held in his pudgy hands, as regardless of his father and mother as of the new objects about him. While his gaze moved over the card, he scratched the back of it gently and incessantly with his finger nails. At times he gritted his teeth; and then again he made a crooning, humming sound with which it is his habit to lull himself to sleep.

He paid no attention to a rattle or bright-colored ball or picture book, he resisted every effort to remove the card from his hands, he became angry, his face purple and he was left to his absorption in the card. From two to six years the child had the flitting attention of a monkey. He would look at nothing but his card. He would walk only a little, until over two years of age, had not even crawled. He had to be taught to crawl and to walk. If he fell on his face, he would lie helplessly crying with his nose to the floor. He never uttered a word spontaneously, could repeat at command only eight words in all, "Kitty," "mamma," and the like. Even a chimpanzee of the same age of this boy, if brought up in human surroundings, will give evidence of understanding more of spoken language than this boy

did. He could not feed himself, could not even close his lips on a cup offered him. In a word, at two years and seven months Don was doing no more than every child should do at five months.

A striking feature of the boy's character was his tendency to anger. He had abrasions about the mouth and ears, which his mother said were due to his scratching and tearing them when he was angry.

"I should like to see him walk," I said. But when he was lifted from the couch, put upon his feet and made to walk, he burst into a paroxysm of rage. His eyes became bloodshot; even his gums bled. When he was put back upon the couch he returned to his contemplative absorption in the card. Offered a block, he made no effort to take it. He even closed his eyes, as though the very sight of it and me were more than he could endure.

When I took the card away, so as to secure his undivided attention, he had another paroxysm of rage.

Following his usual method Witmer attempted to develop the boy's attention by choosing suitable tasks.

If the boy was let alone, peace and quiet was the result. If one attempted to do anything with him, angry resistance was aroused. This expression of energy was an encouraging sign, but it was natural for any one to let the boy alone. "He is a very easy child to neglect," said one of the teachers.

Take away what he held and his hands went up to his ears and mouth, tearing at them till they bled. Tell him to keep his hands down, they went up just the same; perhaps he only scratched himself a little more strenuously. Put mittens on him, as his former nurse did, and he still went through the motions.

Smack his hands, anger and passion intensified the violence

of his resistance. The only thing to do was to hold his hands. Could he be compelled to keep them down after they were released? The historic battle lasted for an hour and a half. His hands were held while his teacher spoke to him from time to time: "If I let your hands go, will you keep them down?"

He raged, he stormed, he grew apoplectic, but the hands were firmly held. At every lull in the storm they were released, and up they went again. In the end he gave in. Ninety minutes showed remarkable endurance, determination and consistency of purpose, qualities which might be successfully employed in his educational development later.

Never again did Donnie hold out for so long on this or any other issue.

Gradually, he responded more and more to training. In 1920, Witmer says of him: "To-day he is a normal boy not quite seven years old, reading, writing, and doing the number work of the second school year."

Under date of February 22, 1923, Witmer writes of his present condition and the prospect of future development as follows:

Donald is now nine years and seven months old. He has just been promoted from the Fourth A grade to the Fourth B; he is doing well in school. I consider him in the best 20 per cent of children of his age. He may be in the best 5 per cent. He continues to display intelligence, as I define it—intelligence in the sense of an ability to solve new problems—and he has a specific language ability. His conversation would probably put him in the best 1 per cent of children of his age. He does not like to take pains, and this makes him relatively less efficient. In consequence, he finds arithmetic and spelling difficult, but remember, only in comparison with children in the best 20 per cent group. I have no hesitation in predicting for him a successful career in college, and a professional career, especially along

lines where a facile tongue and quick insight into the meanings of words are required.

Witmer's diagnosis was arrested development due to fear. Don was afraid of almost everything; he was afraid of a doll, a soft rubber ball, a loaf of bread, a spinning top, but he never admitted that he was afraid of anything.

Of the cause of Donnie's mental condition when he came to us, and which led several experts to diagnose him as feeble-minded, I cannot be sure. He had an illness after birth, which I now believe left his brain so devitalized that it permitted fear to gain the upper hand over desire. Of one thing I am certain: If Donnie had not been given the painstaking and expert training to which we subjected him, he would by now have fallen into a state of irremediable feeble-mindedness.

This remarkable case, apparently hopeless, Witmer wisely calls merely a case of arrested development. It seems clearly to come under the head of what we have called pseudofeeble-mindedness, and probably Witmer is right in believing that it would have proved incurable if it had not received proper training at an early stage.

The noteworthy thing is, on the one hand, the complexity of the symptoms and processes involved, and, on the other, the simplicity of the remedy adopted. First, training to obedience, then training in attention and the development of wider interests, giving the boy something that he could do, and then something that he could not do; a task, obedience, attention, success, failure.

Another case, almost equally remarkable, studied by Witmer, is that of Joanna, whom Miss Parker has decribed under the title "The Feminine Absolute."[26] This is described as a case of hysteria, but the girl was

diagnosed in the first place by eminent physicians as an imbecile.

4. *Lack of Stimulation.*—Arrest of development may come from a narrow environment and lack of sufficient stimulation in the early years. Some children in such an environment, or where parents and teachers have coddled them, and where the children have done everything at loose ends, and always lived and acted at low tension, suffer an arrested development that seems to result from the mere lack of proper stimulation. A significant case has been given by Root:[16]

> The subject, a little girl, was eleven years five months old at the time of testing, I.Q. 67. (Has had simply unbelievable social conditions. Mother and father died of "flu," went with brother and sister, to live with grandfather and grandmother. Grandmother died. Children then alone with grandfather, who is eccentric, morose, grossly ignorant and surly. No companions, and school several miles away. . . . No shoes, no underwear during winter months. Only a few months schooling. . . . No toys, no outside contacts. Squalor and poor food.) This child was as timid as a deer. Although she was almost without vocabulary, and could not read, her ability in the Porteus maze tests, Healy-Fernald construction boards, and her complete lack of the "so-called" stigmata of feeble-mindedness pointed towards a diagnosis and prognosis more favorable than the I.Q. would suggest. . . . At the present moment of writing, she has within a few months acquired sufficient skill to read the passage from the Stanford Revision beginning, "New York, Sept. 5 . . ." without error, but still too slowly to score plus. . . . May it not be true that the monstrous conditions under which the child has lived has markedly deflated her I.Q.? Is it not possible that if the institution in which she is placed offers her even median social milieu that the I.Q. may rise appreciably? The writer would venture the predic-

tion that the subject may attain an adult intelligence of low normal (I.Q. of 85 or 90).

This form of arrest may be found where children are timid or bashful, or where parents have been unwilling to place responsibility on children, have always done things for them instead of giving them the opportunity to do things themselves, and where they have always instructed their children instead of training them. This is common, and the cases are the more pathetic because often the victims are really bright and talented, but have been kept from developing any mental and moral fiber by the fact that they have never been given the opportunity. The bright teacher and the efficient parent are apt to do so much that they leave their children little opportunity to do anything.

Miss Luckey has given a case of a seven-year-old girl who had just entered school.[13] When the examiner visited the school, the principal greeted her with the statement, "Oh! there was a girl so obviously feeble-minded in our first grade that I put her in the special class without waiting for her to be tested." The school doctor also said she was surely feeble-minded.

The examiner tested the child and found that, contrary to the teacher's and doctor's opinion, the child was normal. It then came out that the child, owing to peculiar home conditions, was very timid and not accustomed to playing or working with other children. On the advice of the examiner, she was placed in the kindergarten, where she soon learned how to play with other children. In a month's time there was a complete change for the better, and in the four years that have elapsed since this examination the child has moved through school at a perfectly normal pace.

5. *Overstimulation.*—There is also perhaps a borderline form, due to an arrest of development from overstimulation. The child is overstimulated in the early years, precocious development results, and this precocious development in turn becomes later arrest of development. The plant that might have developed into a tree bearing fruit has blossomed prematurely and remains a barren shrub.

Precocious development sometimes results, it is thought, from premature atrophy of the pineal gland. The result may be real feeble-mindedness; but besides there seems to be a form of pseudofeeble-mindedness due, as suggested, to over-stimulation from the child's environment. Although in concrete cases it is uncertain how far such arrest of development is due to glandular defect, and how far to overstimulation, hygiene looks with grave suspicion upon any form of premature and unrelated developments, even those that result from education.

6. *Inhibition of the Will.*—A large class of cases is that where the serious defect is what may be called inhibition of the will, by unfortunate environment, by the giving of tasks beyond a child's ability and the resulting chagrin of constant failure, or, perhaps, more frequently by the unjust criticism or reproof of parents or teachers. Thus a child's will may be inhibited in regard to certain things and situations; and, gradually, from this the inhibition extends until in regard to practically everything the will is feeble or powerless. With this may be connected a sense of inferiority.

This form is probably more common than is usually supposed. Illustrations have been given in Chapter XII on "Inhibition."

Thus it is often with young criminals. Just as soon

as a youth is branded as a criminal, or even as a bad boy in the school, he is likely to try to live up to his reputation; even if he does not try to do this, the social stigma cast upon him by the reputation of naughtiness in the school, or from arrest or imprisonment, is sometimes probably such as to cause a sense of inferiority and inhibit the will and bring about a form of mental weakness that simulates feeble-mindedness.

7. *Unconventional Education.*—There are cases where children appear defective because they have had a peculiar education, or are the victims of maladjustment of school work, or are able to think unconventionally. The child has some special gift, perhaps, or has had an unusual home training, or is uncommonly bright. Again Miss Luckey has given us a case: [18]

This is a case of a boy coming from an unusually good home and very fine stock. The parents were very much concerned over the poor school reports that the boy brought home. He was not only reported as doing very poor school work but also as being very troublesome. He was eight years old at the time of the examination; but, much to the surprise of parents and examiner, he passed the eleven-year-old tests easily. On the basis of the examination he was put in the next higher grade and since then has had no trouble with school work.

8. *Emotional Arrest.*—One form of arrested mental development is so common and so vitally significant in mental hygiene that it should receive special attention, that is, arrest of the emotional and social development. Just as we now recognize different stages of development in the intellectual life, and just as we know that arrest of development may occur at any one of these stages, so, we may naturally assume, there are different stages of development in the emotional life of the in-

dividual, and that arrest of this development can occur at any stage from that of the infant to that of the individual with the highest development. Unfortunately, we have no studies to show the sequence in the development of the emotional life, and we have no standard tests to determine the level of this development in an individual. We can, however, note the differences between the child's level of social and emotional development and that of the fully developed adult.

The child's level of social and emotional development after the stage of infancy has passed may be roughly described as egoistic and individualistic, self-centered, with impulsive sympathy, sometimes with unthinking cruelty and with attitudes of envy, jealousy, and the like, and, at times, with strong emotional reactions of love, anger, and especially fear.

The characteristics of a few individuals who have what may be called complete social and emotional maturity are the spirit of altruism, of coöperation, instead of individualism and mere rivalry, of group honor and loyalty, of public spirit and public conscience, and interest in social service, instead of mere individualistic acquisition and development.

In such individuals one finds also a larger and broader view of life and the world, so that seeing things in perspective, individual interest is relatively dwarfed in the individual's apperception of the vast relations of the universe, the complexity of the great problems of life, and the significance and fascination of the great questions of political, social, industrial and educational development, and of research in the fields of science and social life.

Again in the individual with fully developed emotional and social life, what James called the attitude

and habits of the gentleman, who ignores and has no time for trivial and insignificant things, is a marked characteristic.

The significance of all this is obvious on reflection, for arrest of the social and emotional development, or the survival of infantile and childish attitudes, is recognized by psychiatrists as quite as serious a form of arrest as that of mental development in the intellectual field.

The time may come, after normal emotional development has been thoroughly studied, when permanent arrest of such development will be deemed as serious as arrest of intellectual development is at the present time, and the unfortunate victims of such arrest be deemed as defective as the feeble-minded are to-day.

Here, however, as in the general problem, the test of normality is a functional one, and an individual may have disordered emotional reactions and childish attitudes, and yet be able to control such reactions, and hence, from a practical point of view, be normal. Thus there are scientific men who have strong emotions, but take the greatest care to discount their own personal equation in all matters where emotion comes in as a factor, and so are able to control their activities by reason in spite of their emotions.

We may add another mental condition, not perhaps rightly called pseudofeeble-mindedness, but one where straightforward thinking is inhibited.

9. *Emotional Complexes.*—There are individuals whose emotions continually inhibit their intelligence and who simulate the feeble-minded because of some emotional attitude of prejudice or suspicion or the like. They form a complex of ideas in regard to men and things and are governed in their apperception of both

nature and society by this complex. These cases, when extreme, develop into cases of paranoia, and the like, with systematic delusions of persecution.

Something less serious than this probably develops in case of most children who acquire suspicious attitudes. The only child in a family is proverbially suspicious, and as soon as he sets up a theory that others are treating him unkindly, it is easy to find evidence of this. The shut-in personality develops, and one feels that all the world is against a fellow. Thus any one who dwells upon the actions of others which might indicate persecution will easily find examples and may develop abnormal attitudes.

Sometimes this takes the form of an attitude of extreme criticism. Critical ability is a mark of superiority and yet by an irony of social fate it comes to pass that, if one constantly cultivates this attitude, finally one can see only defects and faults and is blind to merit and virtue. One sees only the negative side and is blind to the positive side. The constant development of this attitude inhibits the ability to learn, and sometimes this develops to such an extreme that the negative attitude is continuous and ultimately means an arrest of development.

In some cases where intelligence is dominated by emotion we have a striking contrast with the feeble-minded. The individual can think without difficulty. He thinks too much. He thinks beyond and outside of present situations. He gets new ideas and erroneous ideas and sticks to these because quite unable to correct his thinking by reference to experience. And so it comes to pass that with an individual who has excellent powers of thinking we may get the same characteristics, because of inability to correct by reference to experience, that

we have in case of those unable to think, namely, the really feeble-minded.

The individuals of this class live in a dream world. Thinking is their favorite occupation. They form ideas and expect the world will conform to their ideas. Such are the whole class of sentimentalists hard and soft, as Mather calls them, who set over against the real world their own imagined world of things as they would like to have them.[15] As they act on their own ideas without correcting them by reference to facts, they are often quite as badly off as the morons who cannot think. As between the fool who can think, and acts on the basis of the erroneous ideas he gets into his head, and the fool who cannot think, and acts without reflection on the impulse of the moment, there is very little to choose.

A dream world of fancy and mythology seem to be normal for childhood, but later, when the normal child faces reality, he puts away childish things. Some do this only in part.

Other Aspects of Pseudofeeble-mindedness

Uncorrected Thinking.—One can easily imagine in regard to one matter or another arrest of development before the stage of disillusionment may occur, or, in other words, as regards certain matters one may never acquire the habit of correcting one's reasoning by reference to the facts of experience. Whenever this occurs, and so far as it does occur, an individual is as truly feeble-minded for all practical purposes as if arrest of development had occurred in the development of the reasoning powers themselves. And as regards a part of the things in the world, most people never arrive at a distinction between fact and fiction, and none of us

do in regard to all things; thus in a very real sense all of us are in some degree feeble-minded.

This habit of thinking without reference to facts is more common than most people suppose. In adult life it often becomes chronic and incurable. We have seen it exhibited by political parties and whole nations. We all know people whose intellectual activity is of this kind. If such a person once gets an idea into his head, it cannot be eradicated even by a surgical operation. Children of the class we have described are the fathers of such men.

Scientific Thinking.—The scientific habit of correcting one's reasoning by reference to facts not only gives a source of confidence and security and satisfaction in the trustworthiness of the knowledge obtained, as pointed out more than 600 years ago by Roger Bacon, but in many situations this may save one from the beginnings of mental disorder such as delusions of persecution, paranoia, and the like.

In the complex relations of this world, frequently certain events occur that may be interpreted in several ways. A plausible explanation is suggested by any one of several hypotheses. Since all of us are more or less self-centered, usually the individual chooses the one hypothesis that most intimately touches his personal interests. As Sir Arthur Helps has said, "we are at the center of our own thoughts and at the circumference of other people's."

Here the simplest illustrations are the best. A good concrete example is furnished by what one writer has called "the left-over expression" that one often sees on meeting an acquaintance, a somewhat cynical smile, perhaps, that persisted after an interview with an individual your friend met a few minutes before he saw

you. In regard to such a left-over expression several hypotheses are plausible, one that the individual was absorbed in the reminiscence of an unpleasant interview, or that he had just come from such an interview, or that some similar situation caused it; or, finally, that the cynical smile was meant for you personally. The self-centered person, most persons, perhaps, will take the last hypothesis; and any amount of misery may result, unless the individual has the habit of correcting his thinking with reference to the facts—the facts in this case being, either that you know your friend too well, and he would not treat you in this way; or else, if the matter be serious enough you ascertain the facts, and frankly tell your friend what you have noticed and receive the necessary explanation, or in some way test the facts. In a hundred such cases one who corrects by reference to the facts keeps his mind clear and sane; one who does not do so will be thinking the matter over, developing suspicion, holding a grudge, or the like.

The inability to correct one's thinking is especially liable to occur when an individual is under the influence of strong emotion. It has always been recognized that emotion is likely to inhibit intelligence. Even the most highly developed intellects seem liable at times to drop back into lower and more primitive stages of mental life and temporarily under the influence of strong emotion to be emancipated from the guidance of their intellects.

The Impulse to Lie.—An especially good illustration of this seems to be furnished by the experience of Jacks, the London journalist, in his recent investigations of spiritualistic phenomena.[10] Jacks reports that under the excitement of the séance he felt the strongest impulse,

not only to yield to the emotional stress of the situation, but even to lie about what occurred.

Apparently this is by no means an idiosyncrasy of Jacks, for every one under the stress of emotion, in a group of friends or a political clique or an economic or psychic cult, is subject to the same impulse to yield to emotion, and probably the same impulse at times to lie about what actually occurs.

I know an intelligent woman who, when her physician attempted to take her temperature, held the thermometer in her mouth with her lips open so that no abnormal temperature would be registered. She knew perfectly well it was foolish, but at that moment the fear of reality was so great that she felt she could not face it. Again, people do not face the facts of experience because of inertia. All of us are as lazy as we dare to be; and it is so much easier to speculate than it is to observe and verify that most of us prefer to do the former, unless extended training has developed the scientific habit. Even then, however, unless the matter seems of special importance, we are apt to lapse into the easier method of thinking without reference to facts. What is needed is not more instruction and more knowledge, but the development of the scientific attitude of mind. It is the tragedy of education that so many have left the schools without it.

Twisted Thinking.—Especially is it true that, if any one's own personal ego is involved, if one has committed one's self to a cause or an opinion, one is subject to this impulse. This is so well known that it is a maxim among lawyers never to allow a judge to commit himself by expressing an opinion until all one's evidence has been presented. Science and folk wisdom unite in their testimony to this weakness of human nature and the

tendency to fall back under the stress of emotion to a lower stage of development where one is emancipated from the guidance of one's intellect.

This one form of impotence in thinking is well-nigh universal. The feeble-minded person is limited in ability to think. The victim of the defect we are concerned with here can think but does not think straight. To give an adequate account of the inability to think correctly would be impossible. To adopt the figure used by St. John, "I suppose that even the world itself would not contain the books that should be written." About 140 years ago a German writer, Adelung, published the history of human folly in seven volumes,[1] but no publisher could be found to attempt a similar work to-day.

Combined Conditions.—Sometimes several of the conditions favoring pseudofeeble-mindedness are combined, as in the following case:[18]

The parents of a certain eleven-year-old girl became anxious over her apparent dullness. . . . This child had a very comfortable home. Her heredity was good, although her father was a somewhat unstable type. Her development history showed that she had been a delicate child from infancy. Shortly before the examination, she had been ill with epidemic encephalitis. . . . Her vision was very defective, and she had a special disability in reading which had begun on account of uncorrected visual defect, and persisted in the habit of transposing letters in the words being read, which led to frequent mispronunciations. Her dullness in school and her inability to follow the stories of motion pictures were due to this special disability. Her general intelligence, as measured by the Stanford-Binet, was average for her age. She was 11 years 3 months old chronologically, while her mental age on this test was 12 years. (I.Q. 106.)

A feeling of inferiority had been developed in the child's mental life. Her frequent illnesses formed the characteristic background for the growth of such a feeling, and it was

intensified by her consciousness of her inability to read as well as her companions, etc. This sense of inferiority made her lacking in self-confidence, so that she seldom ventured to attempt even the type of work which she could have accomplished in spite of her reading disability. This feeling of inferiority and lack of self-confidence was the worst aspect of her case, since it was the one most likely to lead to personal unhappiness, and interfered with her putting forth the effort necessary for rapid improvement (pp. 409-410).

Such are some of the common forms of pseudofeeble-mindedness. How great the number is we do not know.

The Case of Father Shields.—If it be true that there are these common forms of character and temperament that simulate feeble-mindedness, it may naturally be expected that some cases, at least, will recover and develop out of the class of pseudofeeble-minded into that of normal individuals. Noteworthy cases could be cited. First of all, one thinks of the classic case of Father Shields.[20] Retarded in his development, and remaining an ignoramus till the age of seventeen or eighteen, recognized as a fool in the community, branded as a moron by his own parents, he was then aroused, took his education into his own hands, passed through college and Johns Hopkins University, and is now a well-known professor in the Catholic University at Washington.

Other less notable cases might be cited, cases not only of the development of the retarded, but cases where inhibited wills have been freed, where the narrow shells of prejudice and convention have been broken, and innumerable cases where the responsibilities of a new situation have developed dormant powers. Rare as development and emancipation from these forms of pseudofeeble-mindedness may be, nevertheless they occur with

sufficient frequency to furnish a favorable prognosis if a suitable environment and suitable stimuli can be provided.

If what has been said suggests that in some things we are all feeble-minded, that is precisely the fact; and it may be well if teachers and the community at large come to recognize that even feeble-mindedness is not a condition altogether by itself, to which we have no analogy among the normal, but that there are points of similarity between the normal and the feeble-minded, and that persons physically normal, normal apparently so far as the development of their brains is concerned, may, nevertheless, have characteristics of feeble-mindedness.

Few men who are honest and have normal memories are unable to recall times when they have been astounded at the folly of their own actions and the weakness of their own mental powers. Seldom are we able to look at our own recent action with sufficient objective clearness to judge it rightly, but we are sometimes more fortunate with our behavior after a lapse of a few years. And yet it is not easy even to form a candid judgment of our own childhood and youth. If we read a book like Booth Tarkington's Penrod stories, we get glimpses of earlier stages of development, but such a boy we consider peculiar, and, at all events, we are apt to be skeptical about our own previous condition of immaturity and instability.

Our Lower Stages of Development.—We all know that as individuals we have passed through the lower grades of development, those corresponding to the low-grade imbeciles, the high-grade imbeciles, morons, and so on, but we do not believe it. Most of us, however, have at some time, perhaps, been surprised by some old photograph taken in childhood to see what callow youth we at some

time were. Sometimes we get glimpses that suggest mental photographs of an equally immature and crude mental condition, this, perhaps, by reading over old letters written in youth, or a diary kept, or what not, which reveal the symptoms of feeble-mindedness.

Charles Francis Adams, in his autobiography, has given an exquisite illustration of the difficulty one has in taking the genetic point of view of one's own development. Adams kept a diary during the adolescent period, and he reports his feelings upon reading this over thirty years later. He says:[2]

> The revelation of myself to myself was positively shocking. Then and there I was disillusioned. Up to that time—and I was then about fifty-five—I had indulged in the pleasing delusion that it was in me, under proper conditions of time, place, and occasion, to do, or be, something rather noticeable. I have never thought so since. Seeing myself face to face . . . cured me of that deception. I felt that no human being who, between fifteen and twenty-five, so pictured himself from day to day could, by any possibility, develop into anything really considerable. It wasn't that the thing was bad or that my record was discreditable; it was worse! It was silly. That it was crude, goes without saying. *That* I didn't mind! But I did blush and groan and swear over its unmistakable, unconscious immaturity and ineptitude, its conceit, its weakness and its cant. I saw myself in a looking-glass and I said—"Can that indeed be I" and, reflecting, I then realized that the child was the father of the man! It was with difficulty I forced myself to read through that dreadful record; and, as I finished each volume, it went into the fire; and I stood over it until the last leaf was ashes. It was a tough lesson; but a useful one. I had seen myself as others had seen me. I have never felt the same about myself since. I now humbly thank fortune that I have almost got through life without making a conspicuous ass of myself.

Perhaps we should all have similar feelings if we could read a complete description of the morons and simpletons we once were. Read over your high-school compositions and diaries. Some of us were bolshevists; some merely fresh or silly; all of us perhaps were omniscient.

Examples in the Schools.—Examples of all these forms of pseudofeeble-mindedness are found in the public schools. Every teacher is likely to meet one or more of them—the child who shows symptoms of feeble-mindedness because of some sense defect or adenoid growth or the like; the child with will inhibited because of unjust punishment or constant failure; the child with development arrested because of extremely narrow conventional environment; the suspicious child, perhaps an only child in the family, laying the foundation for paranoia in later life; the child whose thinking is erratic because he does not correct his reasoning by reference to experience; the overstimulated, precocious child, perhaps a candidate for dementia præcox; the child who never has had opportunity for development.

In all these cases there is good opportunity for recovery during the years of childhood and adolescence. They are, for the most part, merely psychoses of development. To diagnose them as feeble-mindedness is the gravest mistake. With all these forms of mentality exhibiting in greater or less degree the symptoms of mental arrest, the teacher may well be on guard against branding any child as feeble-minded without expert diagnosis. All the various tests, checked by the study of the individual's heredity, conditions of birth, and the like, and by prolonged observation, should be employed.

Even the expert, before forming his final judgment, may well consider whether the individual he is testing

may not exhibit some one of these forms of pseudofeeble-mindedness.

The Counterfeit and the Real.—Although, as the name implies, pseudofeeble-mindedness is as far from feeble-mindedness itself as the counterfeit from the real, it may make for clearness to note the contrast.

Feeble-mindedness is arrest of development usually due to inherited defect. Pseudofeeble-mindedness is an acquired defect. The chief characteristics of feeble-mindedness are inability to think and often lack of emotional development. The characteristics of pseudo-feeble-mindedness are inability to think correctly and often an unbalanced development of the emotions.

For real feeble-mindedness there is no cure for the individual. The only remedy is to isolate the feeble-minded in institutions or in some way to prevent the reproduction of the feeble-minded strain. In this way, in the course of a long period, it may be hoped to eliminate such defectives. In case of pseudofeeble-mindedness the cure is the removal of the exciting cause, hookworm disease, malnutrition, physical defect or the like, or, in case of this disorder due to bad training, to remedy the defect by substituting thoroughgoing scientific training.

The Prognosis of Pseudofeeble-mindedness.—The prognosis in feeble-mindedness is hopeless. The arrest of development is permanent, and the child must always remain a child of three or six or ten, as the case may be, even though the individual live to the age of fifty. In pseudofeeble-mindedness the prognosis is favorable. If the disease or defect or unfortunate training can be remedied, the individual's ability to think normally is restored. In feeble-mindedness all of the mental powers are affected, although in some cases there may be un-

usual ability in a limited field, as, for example, remarkable memory for facts of a certain kind, dates, names, or the like. In pseudofeeble-mindedness, if due to disease, physical defect, or the like, the effect is apt to be general. If it be due, on the other hand, merely to prejudice or emotion, the defect may be limited to thought in regard to those things that concern the individual himself and his own emotions and prejudices. The number of individuals in a community suffering from definite feeble-mindedness is usually limited to two or three per cent. In case of pseudofeeble-mindedness it may amount to a majority of the population.

Again, pseudofeeble-mindedness in some degree is likely to be universal, that is, everybody, at some time, to some degree, is affected by it, but in those who are trained it may be only temporary and partial. That is, the individual is unable to reason correctly whenever under the influence of emotion and prejudice, and again in regard to certain things where special training is lacking one is unable to reason straight. But in other things one may be sound and sane in one's thinking.

Summary

1. Cases of feeble-mindedness are cases of arrested development, but not all cases of arrested development are feeble-mindedness. Many such cases are caused by a variety of unfortunate conditions, physical or mental.

2. Cases of arrested development that simulate feeble-mindedness but are not really may be called cases of pseudofeeble-mindedness, a term justified merely by our ignorance.

3. Many cases of arrested development are due to some

physical defect, an adenoid growth, defective vision, impacted teeth, or the like.

4. Many cases of arrested development are due to physical disease, malnutrition, hookworm disease, or the like.

5. Some cases of arrested development are due apparently to the effects of emotional shock, the inhibition of fear, or the like.

6. Cases of arrested development may result from lack of sufficient stimulation in the early years.

7. Some cases of arrested development result from overstimulation, resulting in precocious development, and then later arrest of development.

8. Many cases of arrested development are due to inhibition of the will from some unfortunate stimulus.

9. In some cases children show the symptoms of arrested development because of a peculiar or maladjusted education and the ability to think unconventionally, sometimes cases of unusual ability.

10. A common form of arrested development is due to a general arrest of the emotional and social development. Such arrest of emotional development may be temporarily as serious as the inhibition of intelligence in ordinary feeble-mindedness.

11. A subclass closely related to the above are those individuals whose emotional attitudes of prejudice, suspicion, or the like, continually inhibit their intelligence. These may afterward develop into cases of paranoia.

12. Related to the above are those sentimentalists who are unable to think correctly because they cannot correct their reasoning by reference to the facts of experience.

13. Such cases of pseudofeeble-mindedness may be prevented by proper care, and usually may be cured.

14. Cases of pseudofeeble-mindedness are common in

the schools and in society. It is quite as important for the teacher to recognize them as to recognize cases of real feeble-mindedness.

15. Many cases of recovery from pseudofeeble-mindedness have been reported. Especially noteworthy is the cure of arrested development due to hookworm infection by the use of the usual remedies for curing this disease. Of cases of arrest due to fear a notable cure is that of Witmer's boy Don; and of arrested development due to unfortunate early environment, the case of Father Shields, reported in his book on *The Making and Unmaking of a Dullard.*

Problems and Questions

1. Report cases where children suffering from disease or defect, like hookworm disease, adenoids, or the like, have been mistaken for feeble-minded children.
2. Report any cases you may know of specially bright children who, on account of unfortunate home training or the like, have been mistaken for feeble-minded children.
3. Describe other forms of pseudofeeble-mindedness not mentioned in the text.
4. Do you know of any other case like that of Father Shields where normal children have not received an education because deemed feeble-minded?
5. Report any cases you may know of arrest of development due to inhibition of the will or the like.
6. Taking as the definition of a sentimentalist one who believes things because he wishes them to exist, give concrete examples from your observation and reading.
7. What do you find helpful in your own case as a method for controlling your personal equation in judging matters where emotion is involved?

8. Why do we dislike to be told a thing that we already know?
9. When a person has acquired a dislike of being told, why is it easy to get the idea that one knows when one does not?
10. Give illustrations of the survival of childish mental attitudes in adult life?
11. Why is thinking uncorrected by reference to the facts of experience likely to be injurious to the mental health?
12. Why is it unwise to diagnose a child as feeble-minded without examination by a competent expert?

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CHAPTER XIX

THE RESPONSE AND THE TASK IN PATHOLOGICAL CASES

THUS far we have been concerned especially with the conditions that favor normal healthful development and healthful and efficient habits of mental activity. Assuming somatic hygiene as essential, we have considered the conditions that develop integration of the personality. As a matter of fact, those whose development has been arrested, those unable to make right adjustments, those whose personality is not integrated or has become disintegrated by mental disorder, show in large letters many of the characteristics that appear in a small way in those who have normal minds. Normality, as we have seen, is that functional condition where a general integration can be maintained and right adjustment made in spite of certain distracting and disintegrating factors. To maintain in the mentally disordered as great a degree of control as possible, to check disintegrating tendencies, to develop anew a general condition of integration for the cure of mental disorder, require much the same methods as those necessary for the development and maintenance of the mental health in the normal.

Hygiene is concerned primarily with prevention rather than cure, but, as we have seen, pathological conditions throw much light on normal functions. In case of the psychoneuroses this is especially true. In case of neurasthenia with its characteristic of fatigue, the doing of suitable tasks and the vigorous explosion of energy often provide the best remedy, and the common symptom

of fear is best removed by coördinated action, especially in doing the thing feared.

Again in psychasthenia with its fear, obsessions, indecision, and morbid impulsions, an imperative task is essential, and means of inhibiting the morbid symptoms are always available.

Again in hysteria with its extreme sensitiveness, its egoism, its emotional instability, anæsthesias, and paralyses, there is always opportunity for inhibiting the morbid symptoms. Some of the cases of hysteria, as will be noted presently, are apparently cases of morbid conditioned reflexes, and any puzzling case may well be studied from that point of view.

In these conditions of mental disorder we find the same conditions necessary for the development of conditioned reflexes and conditioned inhibitions, and the same sovereign method for developing integration of the personality or checking the mental disintegration, in the doing of worth-while tasks with a maximum of freedom in the choice and the doing.

Hence it may be helpful to note a few representative cases of mental disorder where injurious inhibitions exist. For this, illustration of hysterical conditioned reflexes, of a more serious mental disorder like suicide, and a serious neurosis like idiopathic epilepsy may be chosen. We may begin, however, with pathological conditioned reflexes.

Pathological Reflexes

A Conditioned Babinski Reflex.—At birth and for some time thereafter if the sole of the foot is stroked with a blunt object the great toe contracts sharply and the other toes show a varying flexion tension. This is supposed to be due to lack of medullation in the pyram-

idal tract. Recently, Resek has been able to form a conditioned Babinski reflex in a pathological case.

A girl five years of age had been sick for two years with infantile cerebral paralysis. There was paresis with pyramidal symptoms, exaggerated patellar reflex, and a positive Babinski reflex. Resek's method of procedure was as follows: he stroked the sole of the foot with the end of a percussion hammer, and immediately afterwards made a movement imitating the stroking near to the sole of the foot without touching it. Afterwards, he obtained a clear dorsal reflex of the great toe. And after longer and more severe stimulation with the electric current, he obtained the same reflex by merely approximating the electrode.

Resek apparently established this definitely as a conditioned reflex by applying all the laws of conditioned reflexes as regards inhibition and the like. His conclusions were as follows:

First, pathological reflexes in rare cases can be produced. Second, conditioned reflexes are especially to be observed in the case of overexcitable individuals. His patient was a very excitable child with lively reflexes. Third, the conditioned Babinski reflex appears to be a defense reflex.

Conditioned Vomiting.—Besides the reflexes important for training, unfortunate or pathological reflexes may be produced in many sensitive children by the conditions of home and school life. A single illustration may be cited from Habermann:[8]

A child is late for school, rushes through its breakfast, feels extreme anxiety as to the outcome (scolding, humiliation, being kept in, etc.), and finally speeds off to school. After reaching there, it vomits. On the following day, although there is no rush nor anxiety, through association of

what happened the day previous, it vomits again. The child I have in mind was congenitally neurotic; the quite normal child would not have reacted in this way. In fact, we see these pathological association reflexes forming in individuals who are "sensitive," or congenitally predisposed.

Holding the Breath.—According to Ibrahim, the phenomenon that a child shows when he holds his breath is a conditioned reflex of a typical kind.[9]* Because of a neurotic temperament or the like, in a fit of passion, perhaps, the child holds its breath once, and this is enough to cause a conditioned reflex. Thus, whenever the child thereafter falls into a fit of passion and crying, the crying becomes a conditioned stimulus for stopping the respiration, and every time the child cries in a fit of anger, he will hold his breath in the same way. This explains a large number of troublesome cases in the behavior of children. It is an easy matter to allow such a violent reaction or inhibition of a normal function to occur, and the association is so intense from the circumstances of the situation that thereafter the child is conditioned, by the act of crying or the sound of his own voice or the like, to an inhibition of the function of respiration. It is interesting to note also that a usual method of cure is to throw water in the child's face or in some way give a shock that will inhibit the inhibition.

A Widening Circle of Stimuli.—In another case cited by Heilbronner, a child has to pass by a dog's kennel, when suddenly the dog rushes out barking, without, however, being able to do any harm because it is chained.[9] The child cries, tries to run away, falls, and remains crying and trembling, and is calmed again after a longer or a shorter period with or without any clear recollection

* P. 39.

of what has happened. The event for the time being remains without any result; but it is noticeable that the child attempts to go around this spot in which the experience occurred. It is thought unpedagogical to permit this timidity; the child is forced to walk by the kennel; but before it comes into the vicinity of the dog, the attack of fear recurs. Further attempts at education in this direction are given up; but at every opportunity brothers and sisters or playmates tease and laugh at the child for his timidity. The result is a new attack. This occurs more and more frequently and under continually varying conditions with each unpleasant experience—a difficult school task, the denial of a wish, in case of very slight physical indisposition, and finally, even on occasion of pleasant events and a pleasant surprise or the expectation of such.

In this example we can trace the way the circle of effective stimuli keeps growing wider—from the repetition of the original situation to the mere mention of the same, and from this to unpleasant situations in general, and finally, to events that have nothing more in common with the original conditioned stimulus. Training in action in relation to the cause of fear and the building up of inhibitory associations would have removed this fear. Rasmussen has reported a case that illustrates this:[19]

When R. was about three years old, she was frightened when an alarm clock, which she had never heard before, suddenly went off. She cried violently. But when a light was made, and she could see the alarm clock and was allowed to make it go off, her fright disappeared, and she quietly submitted to having the light extinguished. All she said was: "The little clock must not say that, because then R. will be sorry." In the time that followed, she was not frightened when the clock occasionally went off (p. 145).

Neuroses Caused by Conditioned Reflexes.—Heilbronner has attempted to show how many of the bad habits and neuroses of children are really conditioned reflexes, and he quotes a number of specialists in children's diseases to illustrate this point.[9] He emphasizes further the fact that the opportunities for developing pathological neuroses by the formation of conditioned reflexes is very great. In fact, the tendency to this is universal.

The ease with which a pathological conditioned reflex may be developed and the great danger of the development of such reflexes in case of children are indicated by such neuroses as the so-called tics and the like. In such cases, at greater or less intervals, in severe cases at intervals of fractions of a minute, convulsive twitchings occur which cannot be suppressed. It is very probable, as Heilbronner points out, that the most identical phenomena may have a different origin in different cases; but for a part of the cases, undoubtedly, he thinks, the course of development is as follows. First, some external stimulus, frequently a stimulus from the conjunctiva of the eye on account of an inflammation or a foreign body in the eye, gave occasion for a thoroughly normal tendency to winking and twitching as a defense reaction, or a pain reaction, which, after the passing away of the stimulus by cure of the inflammation or removal of the foreign body, still persisted; just as everybody has noticed how long the tendency to protect the eye by the hand continues after some dust or the like has been removed from it. The movements also persist at a time when the patient himself believes that he no more perceives the stimulus, when he has even forgotten, perhaps, the original occasion of the reaction. The process corresponds throughout to the development

of conditioned reflexes with this difference, that it is not a question here of the association of one reaction with a quite new stimulus, as in case of the secretion of saliva on occasion of a definite tone, but of the occurrence of reactions which otherwise appear on occasion of qualitatively identical but quantitatively much stronger stimuli, that now occur on occasion of minimal and subjectively imperceptible stimuli. And further proof that in this case something analogous to the conditioned reflexes occurs, appears from the fact that in favorable cases a cure can be effected in the following way. If one has eliminated the twitchings for a time by reducing the sensitivity of the conjunctiva by a drug, they no longer appear when this treatment ceases, that is, when the same stimuli which previously produced the twitchings become active again. The same is true as in case of the dog if one does not reënforce the conditioned reflex from time to time by connecting it with the unconditioned reflex.

Cure by Method of Application.—In many cases the cure seems to be the result, not so much of the remedy given, as of the form in which it is applied. As Heilbronner points out, the psychiatrist may fail in his efforts until he decides to resort to some measure which, as the patient says, has always helped, a remedy recommended, perhaps, by some old shepherd, or an electrical treatment, or the like. As soon as the psychiatrist adopts this method—that is, applies the associated stimulus that has become useful in producing certain healthful conditioned reflexes—the cure is effected.

The Idea of Disease a Cause.—That the lack of mental hygiene often results in physical disorder is a commonplace in medicine. A single illustration given by Williams will suffice:[25]

Every one at one time or another has indigestion; many consult a doctor for this; and most patients are suggestible to a certain extent. The suggestion that the stomach is ailing often remains long after it will bear abundant food. The patient's belief that his stomach is weak is fortified by the fact that he is taking a remedy for it; a real weakness may indeed be created by an irritating remedy. Either of these states results in anxiety at meals; fear of not digesting prevents the relish of food, which is the main determinant of early gastric flow, so that each morsel provokes a suppression rather than an excitation of flow; and of course the meal does not digest properly.

Of more serious inhibitions we have plenty more or less pathological. In the experiences already mentioned of shell shock throughout the war, we have innumerable illustrations of such inhibitions. The frequent cure of shell shock by a shock of some kind illustrates the way in which such inhibitions can, in turn, be inhibited by other stimuli if they are sufficiently strong; whereas the cure of such cases by training, on the other hand, shows how, by many repetitions, inhibiting stimuli and associations may be developed.

The psychiatrists have long recognized that in many cases of nervous and mental disorder the most serious trouble is an inhibition of some kind. Just as one's intellectual ability is often arrested by unfortunate inhibitions, so certain inhibitions may be so serious that their presence or absence means the difference between normality and serious mental disorder. Hence, as psychiatrists recognize, the important thing is some means of removing injurious inhibitions.

From the point of view of association and the conditioned reflex we have seen that the remedy for unfortunate inhibitions—whether conditioned reflexes, associated ideas, mental attitudes, fear, or what not—may

be stated in general terms by saying that it is always possible to remove the inhibition by associating a new stimulus of sufficient intensity with the unfortunate association—that is, to inhibit the inhibition by a new and stronger stimulus. The new reflex or association may be established by shock, or by many repetitions, or by constructive activities in relation to the object of fear or the like—that is, by establishing a system of conditioned reflexes or associations.

This whole matter of inhibition and the widely related aspects of it should, in the light of the results that have been obtained, be studied as broadly and considered as generally as the law of stimulation and what we are apt to look upon as positive association.

The Physical Correlative of an Associated Idea.—If an entirely indifferent stimulus like the mere sound of a bell, or the striking of a certain note can call forth a definite physical reaction like the secretion of a gland, we may well imagine that in certain cases a mental image or idea and even any attitude or *Einstellung* may, in like manner, be associated with the ordinary stimulus, become a conditioned stimulus, and call forth a definite physical reaction of a gland or a motor organ. Thus we can see why an individual's mental processes and the various associations formed with a situation or any form of activity may be so significant for the health. "If," says Sidis, "a painful affect—emotion—originates while eating but is repressed, it may produce nausea and vomiting and continue for months as an hysterical symptom."

Suicide

Another psychoneurosis, suicide among children, has been the subject of considerable investigation in several

countries, France, Germany, and others. Recently, this has received some attention in the United States. Terman some years ago estimated that the annual number of suicides is 500 for those under 17 years of age, and exceeds 2,000 for those under 21 years of age. Figures collected by the Save-a-Life League have been reported for recent years as follows: *

1919	477
1920	707
1921	858

"That is a 50 per cent increase in one year and 80 per cent in two years," says Warren. "The high ratio is continuing in 1922. Last year 485 girls and 373 boys took their own lives. The average age of boy suicides was 16, girls 15. Most girls used poison, boys a gun."

Lack of tact and sympathy in parents and teachers is given as largely the cause of the increase in child suicides. More concretely the chief reasons given are as follows:

1. School affairs, particularly horror of examinations.
2. Parents' lack of interest in problems of child life.
3. Love affairs and unhappy child marriages.
4. Revenge for reprimands.

As regards teachers, the president of this League, Dr. Warren, is reported as saying:

Teachers can be, and usually are, of wonderful aid to parents in helping children solve these problems. But some teachers are not so far-sighted. Children in school have a horror of examinations and many grow morbid over fear of not being promoted.

* *Concord Monitor*, Concord, N. H., August, 1922.

I once heard a teacher tell a pupil before an examination: "You cannot possibly pass." I consider the remark brutal and criminal.

The study of the causes of suicide by Stearns also indicates that unfortunate school conditions constitute a factor of appreciable significance.[23]

Suicide in France.—In an older investigation Proal made a careful study of suicide among school children in France, and among the causes of such cases found many connected with the school and the child's reading, and he emphasized suggestion and autosuggestion as an important influence.[16]

It is specially important, according to Proal, to control the reading of children. Suicide is often suggested by what they read. He recommends placing thoroughly optimistic literature in their hands, and he condemns literature that expresses a pessimistic view of the world. Pessimism and nervous weakness very often go together, and especially in the case of students are likely to appear in times of nervous overstrain. There is grave danger of the spread of suicide from the suggestion given by detailed accounts of cases in the newspapers. This is recognized as a means of contagion, not only in the case of adults, but in still greater degree among children. Napoleon I is said to have striven energetically against the publication of accounts of suicide, since a case was known to him in which a thirteen-year-old child took his life under the impulse to imitation from hearing of the suicide of other children.

Proal maintains that to discourage a child, to say to him that he has poor ability, bad character, and will come to no good, may even paralyze his force and take away from him the purpose to improve. The most

demoralizing thing is the thought that he is doomed by inheritance to a certain fate. Brieux urged an intelligent young man to avoid the intemperate use of alcohol. He answered: "Why, I am the son and the nephew of inebriates and am doomed to the fate that ruined my father." On the contrary, Proal takes the modern view that pathological inheritance is in the form of disposition only.

The one thing that, perhaps, stands out speciafly in Proal's study is the enormous power of suggestion, and especially of autosuggestion which has its source in the child's belief in his own power. As Meumann points out, the child's belief in his own strength, his confidence in himself, and the subjective conviction that he can overcome the difficulties and handicap of his own character, even in the case of perverse children and those pathologically endowed, can have an extraordinarily great influence; and, inversely, mistrust in self and discouragement have an injurious effect.

A Partial Explanation of Suicide.—From our present point of view the explanation of suicide, except in cases of distinct physical disorder, is in part at least as follows: A child finds itself in what appears to be an intolerable situation. Some defense mechanism must be resorted to. Suicide is suggested by the child's reading or what he has heard; no other defense seems possible or, at least, adequate; the determining tendency to defend one's self is touched off by the suggested stimulus, and the tragic result follows. The mental mechanism, however, is not different from that in many other cases of defense where the integrity of the self seems to be threatened by the situation in which the child finds itself. Of course, these situations may be anything whatever that appear intolerable to the child. It is not

strange that many of them are situations connected with the school and school work.

The training for prevention of such serious psychoses is similar to that for those of minor gravity, that is, training in responsibility, in meeting difficult situations, and especially in the active attitude, with the insight that, however evil the situation, something in regard to it can always be done, and the fight is always worth making for its own sake if for no other reason. With some children it may be hard to develop this attitude, but something of this probably can always be developed.

The influence of suggestion in morals is not a matter of indifference to hygiene. Observation shows that just as fads and certain forms of disease are likely to be spread by suggestion, so, also, habits and customs of moral or of immoral character, interest in health, the practice of many sports, and the useful activities of the Boy Scouts, are all spread by imitation and suggestion. On the other hand, bad habits and crime are likely to be spread by suggestion. The detailed description of crime in the newspapers and popular literature is a serious factor in spreading evil by psychic contagion. Especially is this true when the details of crime and the life and behavior of criminals is so depicted that it casts a halo about the criminal and makes him appear in the aspect of a hero. By these accounts many young people are abnormally excited, and not a few Sentimental Tommies are liable to become criminals as a result of such reading.

The Task in a Case of Epilepsy.—Even in extreme nervous disorders the value of the task appears to be great. A single concrete illustration of a case observed by the writer may be reported. The case was that of V., an epileptic boy. The disorder appeared first in minor

form, *petit mal,* in childhood, but developed later into *grand mal.* For a period when the boy was about fourteen he was observed daily by the writer. At that time he would have sometimes ten or a dozen attacks during a single night. During some ten years in which the writer saw more or less of the boy he had probably from 10,000 to 12,000 epileptic attacks. A number of the best specialists were consulted, but the boy grew worse and worse, until finally he was sent as a chronic deteriorated epileptic to the Craig Colony in New York.

Here the boy was given not only medical treatment but a regular regimen and daily tasks. After a year or two of residence at this Colony the boy was cured of the epileptic attacks and returned to his home, where he led a regular life, worked in support of his mother, and now after some thirty years is, I understand, holding an important position as a public stenographer. This remarkable case, unique in the history of the Craig Colony, has naturally received much attention. Some interesting features of the case should be cited more in detail.

In his early observation of this case at the age of about fourteen, the writer succeeded one day in postponing the epileptic seizure for half an hour apparently by the device of specially eliciting the boy's interest and giving something that would absorb his attention. He wondered whether the same method were not used at the Craig Colony when the cure of the disease was effected.

One seldom has the opportunity to complete an observation after a lapse of thirty years. This, however, was the writer's good fortune by the courtesy of Dr. L. Pierce Clark, who has studied this case and reported upon it.[5] Meeting Dr. Clark about a year ago the writer

told him of the little experiment tried on the boy years before, and then put the question: "Did you use the same method for cure that was used in this experiment for temporary postponement of the convulsions?" Dr. Clark immediately replied that he did, and reported the mode of treatment in substance as follows: First, the sedatives that had been given in large quantities were discontinued. Then the boy was given work in which he was especially interested, namely, working at the printer's trade, an occupation in which he had been interested from a child, together, of course, with regular regimen and care. In a word, "a simple and sensible scheme of reëstablishing a series of spontaneous interests was successfully made use of."

The result briefly was as follows: during the first month the boy had 103 attacks; during the second month, 33; during the third month only 6; after that only a very few; and soon no more attacks whatever, and a record of work for many years after leaving the Colony. This was a noteworthy case apparently of the significance of the mental factor in at least some cases of epilepsy.

Some readers will naturally ask why, if this method of treatment was so effective, it has not been used in other cases. With such questions of therapeutics we are not concerned, although parenthetically it may be added that Clark has shown the value of the interesting task in the treatment of epilepsy, and the method has been used successfully in other cases. The place of the task in medicine, however, we leave to the physicians. We are concerned with its place in hygiene. One who, like the writer, knew this boy intimately finds it hard to believe that the beneficial influence of the interesting task in the cure of the epileptic seizures in this case

would not have been equally helpful as a means of training for the prevention of the disorder.

Preventive Training.—According to Riggs, nervousness usually has its beginnings in childhood, and preventive training should then be applied.[21] The symptoms of potential nervousness, according to him, are four: "(1) sensitiveness to the disagreeable and painful; (2) overbalance of one or more instincts; (3) faults in application of intelligence and ideal to instinctive forces (character faults); (4) unevenness in the relative development of the physical, mental, and moral sides during growth." (p. 75.)

One or more of these, Riggs maintains, is always the cause of nervousness. Early recognition is not only necessary but possible. Especially, perhaps, should be emphasized the tendency to oversensitiveness recognized even in the early months of life. A certain class of children are oversensitive to emotion. Physically, they show overreaction by a tendency to cry, by disturbances of digestion and circulation. They blush and blanch easily, they perspire too easily under excitement, cry easily, and their kidneys are overexcitable. Mentally, they are unusually dependent on praise and approval, are oversensitive to disapproval, are likely to avoid conflict with authority by exaggerated good behavior or by deception and lying. They show a great repulsion to the disagreeable, whether disagreeable sensations or painful emotions. This oversensitive temperament calls for definite training.

Such children are apt to be misunderstood, and wrong training is given, either too severe punishment or avoidance of discipline altogether. The training should aim to mold the sensitiveness into a useful force. A child should learn to face the disagreeable and realize the

naturalness and normality of his emotions, especially of fear, and should be trained to team play and normal courage.

The Wider Significance of the Task

Thus the task, as we have seen, individual and social, represents the essentials of mental hygiene in their simplest terms. Simple as this is, it involves some of the most recent and significant movements in education and mental hygiene. This truth has become a fundamental principle generally accepted to-day in psychiatry. It has been clearly and emphatically stated by Dr. Adolf Meyer and others, and its significance and wider relations have been suggested. Thus Meyer says[17]: "This growing conviction that personality is fundamentally determined by performance rather than by mere good will and good intention, rapidly became the backbone of our psychology and psychopathology."

Thus the great thing in mental hygiene is to give opportunity for significant tasks, and the great problem for the psychiatrist is in devising means to obtain performance when it fails to come spontaneously. The rôle of the psychiatrist "consists in giving opportunities rather than prescriptions." It is the same with the teacher and hygienist.

This principle of mental hygiene is in harmony with the larger philosophy of science and of life. If any one cannot see the meaning of it because of its simplicity, he should read the recent literature of science.

Meyer has shown the evolution of the movement in this country from the vague recognition of its significance in the early 90's, the advance to the new stage of blending work and pleasure, and the later stage of development with the "systematic encouragement of interest

and concern about the actual use of time and work." This evolution, he points out, was in harmony with the general rise of the science of energetics or applications of work recognized by Ostwald and others.

Even in the practical work of the hospital, Meyer emphasizes the fact that the tasks "must give the satisfaction of completion and achievement," and he adds: "Performance and completion form also the backbone and essence of what Pierre Janet has so well described as the *'function du real'*—the *realization* of reality, bringing the very soul of man out of dreams of eternity to the full sense and appreciation of actuality."

In psychology, as we have seen, the task, the *Aufgabe,* is the fundamental thing. In all higher education, where emphasis is on research, the problem taken for investigation, the *Arbeit,* is the most important work of the student. Even evolution itself is best understood from this point of view; action, performance, has been the significant thing from the outset. As Goethe used to say, action, function, was the beginning, *"In der Anfang war der Tat";* and the significance of function, performance, has been recognized in relation to the integration of organisms. As Meyer has recently said, evolution consists in the integration of lower acquisitions into higher entities.

The Gospel of Work.—The modern attempts to utilize the hygienic and therapeutic value of work have given noteworthy evidence of its significance. Forel, the Swiss alienist, was one of the first to emphasize the value of interesting tasks in the cure of the mentally disordered. Recently, concrete experiments in vocational activities in many hospitals have shown valuable results. The introduction of work into the schools for the feeble-

minded has made them especially places of happiness and content. The employment of work therapy in the ordinary hospitals, for all patients where possible, has already proved helpful. Vocational guidance in all forms of social service has revolutionized philanthropy, and among the normal nothing is so significant as the active methods now used everywhere in the best schools for children. For normal men and women, also, the gospel of the task is quite as important for the maintenance of health as in the education of children and defectives.

Thus in all conditions of life and all the varied situations in which an individual may be placed, in periods of monotony and boredom, or in times of storm and stress, in all the varied fortunes and misfortunes that meet the individual, when opportunity is lost, when disheartened by failure, even in conditions of distress and despair, the day's work is the one consolation; and with habits of coördinated activity, of mental and physical work developed from childhood, one has always an anchor of safety whatever the mental chaos and distraction.

Psychoanalysis

It is not the place here to give an exposition of psychoanalysis. It may be helpful, however, to note that a distinction should be made between the practice of psychoanalysis and what may be referred to as the science of psychoanalysis, or the psychology that lies back of the practice. The essential feature of this psychology is the belief in the unconscious, the view that back of our conscious mental activity, deeper than our conscious mental processes and more significant than our conscious motives, are the unconscious mental processes and im-

pulses and motives; that in this larger, deeper, and more significant unconscious, are the repressions, distractions, and mental lesions that destroy the mental health. The remedy may be found in the reaction of conscious thought and the reform of one's behavior in harmony with this deeper and more powerful unconscious self with its deep-seated impulses and tendencies.

We are not here concerned even with the practice of psychoanalysis, however important this may be for the teacher's own personal health, however valuable it may be for one's pupils. This is a special method of cure to be used by expert psychiatrists. Certain principles and general rules of practice in psychoanalysis are, nevertheless, based on certain important truths in educational psychology; and mental hygiene utilizes and makes them available in the practical work of teaching without the need of showing their place and the methods of using them in the medical practice of psychoanalysis.

Psychoanalysis and the Conditioned Reflex.—For psychoanalysis in the technical sense, as employed by the psychiatrist in his clinic, or in the lay sense as practiced by a preacher in confession and the like, or by the teacher like Socrates, or by the individual thinker like St. Augustine, or Jonathan Edwards in meditation, or by the individual patient, as advised to-day by some psychiatrists—for all these, the method of the conditioned reflex has an important contribution. The significance of this has already been suggested.

It is well illustrated in our social relations, or the affective situations of the individual in relation to other individuals and to the social group, especially when we consider the association of ideas and mental attitudes as well as the association of stimuli. Kempf does not put it too strongly in the following passages:[12]

The *conditioning* capacity of the reflex is of the utmost importance in determining our selections and aversions throughout life, such as mating, habitat, friends, enemies, vocations, professions, religious and political preferences, etc. We can understand now how we come to have an avertive prejudice for one person, experience, or object because it has qualities that happen to be similar to some of the qualities that another person, object, or experience had that caused us to feel pain, fear, or embarrassment. Similarly we prefer those new things that have some of the qualities of old things that were pleasing and invigorating stimuli.

It seems naïve to urge that every person, friend or enemy, is essentially a compound stimulus that varies more or less in its gratifying or distressing influence upon an individual, but the stupid resistance to psychoanalysis and the adjustments of repressions makes it necessary. The conditioning of fear, hate, love, shame, sorrow, hunger, occurs without our conscious choice that these affective-autonomic functions should or should not prefer to have or to avoid certain objects, persons, or situations. These mechanisms may often be obscure, but in one respect they are consistent. They are *always determined by experiences* (p. 15).

Bizarre Actions.—Every one, perhaps, at times has noticed the peculiar character of his own action or the strange things he finds himself sometimes saying. Probably many of these cases are to be explained as conditioned reflexes.

We can sometimes detect these mechanisms in concrete and trivial matters, as well as in those more serious referred to by Kempf, but the ordinary person is not likely to notice them.

A classical case was given by Betz from his own experience, reported in substance as follows:[1] Riding in a street car one day, Betz saw a man settle himself comfortably with a cigar in his mouth. Just then a slight accident jolted the car and threw the cigar out

of the man's mouth in a ludicrous fashion which caused Betz to smile. Some days afterwards, he met a stranger on the street and found himself involuntarily smiling. Then he tried to recall the man, whose face had a familiar look, and the involuntary smile enabled him to do so. The man was the victim of the street-car incident that had caused his amusement.

Here the smile was an ordinary example of a conditioned reflex. The personal appearance of the man seems to have had no essential relation to the humor of the situation; it would have been as ludicrous in the case of any other man. But the appearance of this man became associated with the original situation as a conditioned stimulus and brought the same smile.

Instances of this kind, in which a part of a situation conditions the reaction to the whole of it and also brings about a recall of the original circumstances, are of everyday occurrence. The unfortunate social possibilities in a case of this kind are obvious. Innumerable occurrences in the schoolroom, misinterpreted both by teachers and by amateur Freudians, are probably cases of this kind. The point of view of the conditioned reflex gives a simple explanation of much bizarre behavior and ridiculous speech.

The Aim of Psychoanalysis.—Without attempting any critique here of modern methods of psychoanalysis, one point is so clear that all competent specialists will perhaps agree in regard to it—namely, the hygienic necessity of removing unfortunate inhibitions; and, so far as clearing the field and removing obstacles to healthful mental development goes, it is perhaps not too much to say that the aid given the patient by psychoanalysis in the removal of such inhibitions is the most important benefit rendered.

Thus the essential aim of psychoanalysis is represented in the following statement by Freud:[7] "It is not the discovery and counting and tabulation of complexes that is the object of psychoanalysis, but the sole object of psychoanalysis is the overcoming of the patient's resistances." (p. 2.)

Brown puts it as follows:[2]

The object of psychoanalysis is to investigate the trains of thought which, directly or indirectly, have produced a given morbid psychical disturbance. Every one is reminded at times of experiences that are distasteful, and even repulsive, the memory of which we endeavor to ignore; and the mental conflict which this repression involves varies in intensity according to the nature of the experience in question and the temperament and education of the individual. Such memories and emotions are called "complexes," and when they are forgotten and cannot be called into consciousness they are called "buried complexes." They usually relate to some fundamental instinct or desire, and when circumstances prevent these desires from being gratified some compromise must be reached. Under normal conditions such repressed desires are directed into healthy channels; they are "sublimated," and the energies find outlet in some form of active work, but in some cases no such outlet is found, and the buried complex becomes a center of internal stress till a "substitution" takes place and hysterical symptoms appear (pp. 290-291).

The Inhibitions of Fear and Their Cure.—Without technical language or details, some of the essential psychology of the mode of procedure may be simply and briefly illustrated in the case of the universal inhibitions of fear.

Probably, as already noted, every child is handicapped by inhibitory fears of some kind. Such inhibi-

tions may be illustrated by almost any of the common, but often grotesque, fears of childhood. For example, a little girl had heard certain incendiaries referred to as firebugs and had listened to a newspaper account of a terrible fire which, according to the report, was set by a firebug. Thus she gained the idea that there were certain insects that set fire to houses, and, naturally enough, she became afraid of these incendiary bugs, lest her own house might be set on fire. To a child's imagination, an insect like this that walketh in darkness and can effect such tragic results naturally became a secondary cause of fear. Usually a child conceals such fears. If discovered, the method of removing them is simple. But concealed and repressed, a fear of that kind or the inhibition it leaves is liable to cause injury for a lifetime, as every psychiatrist knows. Rows, of London, has told of a case of nervous breakdown and insanity in a woman of thirty-five which was traced back to a fright the child received at the age of five from the bogey stories and behavior of her nurse.[22]

Let us take another concrete case: Charles Lamb, in his essay on "Witches and other Night Fears," says of himself:[14] "I was dreadfully alive to nervous terrors. The night-time, solitude, and the dark, were my hell. . . . I never laid my head on my pillow, I suppose, from the fourth to the seventh or eighth year of my life, so far as memory serves in things so long ago, without an assurance, which realized its own prophecy, of seeing some frightful spectre." (p. 107.) The form of his visitations he attributes to the picture, in Stackhouse's *History of the Bible,* of the raising of Samuel by the Witch of Endor.

Whether the morbid attitude be of long standing or recent, the psychology of the remedy is briefly as follows:

One brings the fearful idea clearly to consciousness—lowers the threshold for the idea, as the psychologist puts it. In other words, one brings the child definitely to face the cause of its fear, just as the horse trainer, with soothing words, leads the colt up face to face with what has frightened it. Then one associates a rival stimulus with the fear-inspiring object or idea. In the case mentioned, one would show the child, perhaps, the grotesque and comic aspects of the Stackhouse picture, or convince him that it was nothing but a drawing on a piece of paper similar to what he himself could make—that it represented at most an imaginary object, a make-believe representation. By such a discussion, rival stimuli would be associated with the picture, and after a few conversations of this kind, these associated ideas would inhibit the fear; amusement or orderly thinking would take the place of it. It is always possible to associate a wholesome thought or attitude with the original stimulus as a rival stimulus that shall, in turn, inhibit the inhibition.

The general problem, then, is how to form some association with the general attitude of worry which so many people have, so that as soon as this attitude becomes nascent, it may at once be inhibited by some healthful association. That this can be done and actually is done in many cases we have evidence from many individuals of different classes in society, diverse interests, and varying degrees of education. Apparently, it may be any one of a number of things, if only the association be made strong and permanent.

As we have seen, in case of fear a number of factors serve to remove the inhibition if they can be used, most of all doing the thing one is afraid to do. Now the psychoanalyst maintains that in the more serious cases

one does not know what the inhibition really is, and so by a process of analysis the psychiatrist attempts to bring the hidden inhibition or fear out of the unconsciousness and into the clear light of consciousness. This in itself is often enough to effect the cure; but the other part of the process is to associate some harmless and helpful idea or attitude, or reaction of some kind, with the inhibiting complex that has been raised above the threshold. Theoretically, it is very simple, and many illustrations may be given.

As an English psychiatrist has recently said:[4]

> Psychoanalysis is not essentially a therapeutical measure. In certain cases it has a remedial value, either because it assists an intelligent patient to understand better, and therefore to deal better with, his mental disorder, or because it establishes a relationship of confidence between the doctor and the patient which is helpful to the latter and which is the fundamental requirement in all successful psychotherapy (p. 451).

Another aspect of the psychoanalytical process, however, is interesting.

The Tasks Involved in Psychoanalysis

In many cases what the patient needs is a task worth while—some interesting work to do. But often the patient is not interested in work. No task appeals to him. He is interested only in his own experience and his own symptoms. Go to, then, says psychoanalysis, your task shall deal with yourself. Thus psychoanalysis may be just the thing; for it concerns itself with the patient's own experience, and gives the task of studying precisely that. This may be made clearer by a concrete example.

Recently a gentleman consulted me in regard to his own mental condition. He complained that he had lost interest in his work. Whereas once the days were all too short, now he found time hanging heavy on his hands and he had no absorbing interest to fill the vacant hours. In such cases one may naturally suspect something wrong with the individual's physical health, with one's stomach, liver, glands, or some other organ, possibly an infection or the like. As this patient was a man of intelligence and common sense, he consulted a physician.

The physician made the usual examinations and asked the usual questions; and then when the patient told of his mental condition and reported that little things worried him, the physician asked an unusual question, namely this: "What is one of the little things that worry you? Give me a definite concrete example." The patient gave the answer desired, the physician was sympathetic and said he quite understood the matter. The interview ended with advice in regard to diet and the like.

In reporting this experience with the physician the patient said that the one concrete question in regard to what was the cause of his worry, although it applied to nothing that really did worry him, was worth the fee paid; and this suggested the proper remedy.

As the patient put it, what he needed was to have some one come to him with a definite task and say, this work must be done and reported to me at such a time. You must write out certain points, you must present certain facts and details. It is tremendously important for me, and I will pay you so much for it. With such a definite and concrete stimulus for doing a task that was really significant, the patient felt that he could go to work and the situation would be remedied. In a

word, this man needed the opportunity for activity and the hope and stimulus of success that comes from doing a task that seemed worth while.

I suggested a number of tasks, subjects for investigation that would require the collecting of facts, the systematization of material, and the preparation of an article that would be significant and useful. But the patient replied that it was all abstract and vague, and that in his low mental condition he was unable to get sufficient stimulus from such a task, and what he needed was something definite and concrete, and something that would be useful to somebody else.

In vain I suggested the attitude of one who sees that activity is worth while for its own sake, that the fun is in the fight, that the zest of life comes from the gamble more than from winning, that the game is worth while for its own sake. In vain I mentioned the men of action who ignore their feelings and care more for the doing of a thing than for the reward.

With remarkable insight and cleverness this patient was able to prescribe the remedy needed in his own case; but the trained physician whom he consulted could not apply it. He began in the right way with his definite concrete question in regard to one of the things that caused worry. If the physician had asked not merely this one question for which the patient was so pathetically grateful, but had asked a score of such questions, and had prescribed the task of writing out the answers, he would have placed the man on the road to recovery. Failing to do this, he left him in the tragic position of one who knows the remedy he needs, but is unable to find any physician to administer it. He needed a task; he received only advice.

A concrete case like this, which is representative of a

vast number where men lack definite and engrossing interests to furnish the proper stimuli for work, is especially instructive in regard to the psychological reason for the success of the psychoanalyst in many cases.

Reporting One's Dreams.—The Freudian psychoanalyst does precisely what this patient so cleverly suggested as the method of treatment needed in his own case. The psychoanalyst first of all gives his patient a definite and concrete *Aufgabe* or task, and he tells him that this is vitally important and significant. He begins, perhaps, by giving the patient the definite task of writing out his own dreams, a perfectly concrete thing, which the psychoanalyst assures him is vitally important. The patient does the task prescribed, and in the doing of this has a wholesome form of activity and to some extent a wholesome reaction to his own feelings.

Free Associations.—Again, the psychoanalyst gives another concrete and definite task by calling for free associations. He gives a word and asks the patient to write out all the words suggested, and then gives another with the same task, a score perhaps in all; but in any case the task is definite and concrete, and the activity in performing it a helpful one.

An Autobiographical Task.—The psychoanalyst asks also for an autobiographical sketch from the patient given, probably, orally rather than in writing, but in any case a report of the patient's own past experience. And then the free associations and the dreams are considered in relation to the facts of this past experience. It is always possible to suggest significant relations between these two series of mental experiences; and these relations appear to the patient as vitally important. The dreams are his own dreams. The associations tap his own experience. Thus the task prescribed is not only

concrete, but significant, and hence the activity required is interesting.

Still again, in giving the task of reporting dreams and of writing out or reporting free associations, the psychoanalyst tells the patient to report anything whatever that comes into mind, no matter how nonsensical or chaotic or irrational, because all these things have importance.

The Task Made Interesting.—The psychoanalyst makes the task the more interesting and the more significant to the ordinary patient by giving some account of the Unconscious. This, which is sometimes merely a form of psychological astrology, gives to most people a suggestion of the transcendent significance of the whole matter. Here, as represented to the patient, within the vast realm of mind unknown to the ordinary individual is a storehouse where all the experiences, hopes, and desires, the failures and successes, the tempestuous passions and the divine emotions of the individual are treasured up.

In this unconscious memory, as described to the individual, are all the grudges of a lifetime, the insults and offenses of personal experience, the affronts and wounds of injured pride, the petty meannesses and strifes, one's own hideous blunders and mistakes, one's misunderstandings and frictions, the hurts and grievances, the lapses in our morals and the shocks to our ideals, all the long-forgotten secrets about one's self; and, besides all this, many simpler and subtler memories that contribute their influence, however slight, in determining character and behavior. In this vast storehouse of the Unconscious are not only the acts and thoughts of the individual but the record of all the experiences of one's ancestors to the remotest simian and beyond.

The total combined experience is unified by some mysterious power that takes the helm and guides the conscious life, working, on the one hand, for the welfare of the individual to fulfill his most profound and primitive instincts and desires, and even to objectify long-forgotten impulses, and, on the other hand, in suppression of conscious memory whenever it is in conflict with the Unconscious.

All this furnishes precisely that element of mystery and halo of transcendentalism that appeal to most individuals. Thus by this doctrine and concrete examples in the definite conflicts of the individual, as illustrated in some such book as Lay's *Unconscious Conflicts,* the task appears to many of infinite significance.

With such a method the concrete and significant stimuli that my patient so pathetically called for are furnished. A task requiring one's dreams, one's associations, one's personal experiences, the analysis and relation of these experiences one to the other, the assurance that even the most idiotic and chaotic associations are significant; and, finally, the halo of the Unconscious with its conflicts and its strivings

Reasons Why Psychoanalysis Works

If for no other reason, the task given by the psychoanalyst is likely to appear significant to the patient because it concerns the one thing in the world that to him is the most important, namely, his own personality.

The criticisms of the Freudian method of psychoanalysis are well known. It is objected that their system is in defiance of orthodox psychology, that we know nothing about any such limbo of the Unconscious as they postulate, that their interpretation of dreams and free associations is fantastic and often ridiculous, and that,

in general, a sound psychology is sacrificed to a fantastic schematology. The answer of the practical psychoanalyst is always likely to be this: Psychoanalysis does work, and many patients are cured by the method. All this is true enough; and without attempting any exposition or thoroughgoing analysis of psychoanalysis itself, some of the reasons psychoanalysis works are simple and easily shown on the basis of the psychology of the task.

1. *The Patient Must Face Reality.*—The first essential factor in the psychoanalytical cure is the fact that the patient is brought by this means to face reality. Nothing to many men and to most psychopathic patients is so difficult and repugnant as the mere act of looking the facts in the face and actually facing the truth. And when an individual who has long refused to do this is brought by any means to face the facts, the mental reaction and the mental relief that result are probably in many cases equal to the results of religious conversion.

As already noted, all of us are apt to shrink before reality. We all live more or less in a world of sentiment, a world where we picture things as we would like to have them; and we substitute this world of imagination for the real world of actual things and actual people about us.

2. *Reaction to Feeling.*—Psychoanalysis gives the patient opportunity for a form of normal reaction to repressed feeling. As Freud and his disciples have pointed out, and as everyday experience indicates, an individual can endure a large amount of repressed feeling, or, in Freudian terminology, carry a large number of affects that have not been reacted to normally without serious results. But beyond a certain limit such repressed feelings are a serious burden; and a great part of the good results from psychoanalysis come from the

means afforded of expressing one's feelings by discussion, confession, and the like. As a recent writer expresses it:

> Apparently the theory on which all the varied forms of this treatment are based is that the catharsis of the mind is essential to mental health, the emptying of all that is in it, the expulsion of dead matter. The nausea of the soul is relieved like its physical analogue by freeing it from the undigested matter, the "repressions," that lie so heavily upon it. The self-contained nature that refrains from spilling over and strives to maintain itself without recourse to the safety valve of confidence must in the end unload its burden.

3. *The Stimulus of a New Idea.*—Another factor is the stimulus of a new idea brought into the mind of the patient by the psychoanalysis. Any new idea in an individual's mind is a significant stimulus. This is the advantage of change of environment. In a world of convention, where everyday duties are pressing, one's environment is narrow, and one's mental resources limited, new ideas are rare guests, and to most individuals the mental stimulus that comes from really grasping a new idea is significant.

4. *Coördinated Thinking.*—The fourth factor is the coördinated thinking that results from the stimulus of a new idea and the doing of concrete tasks. Any form of coördinated activity, physical or mental, which insures attention to the present situation, the use of the intellect and orderly association in regard to a definite subject, is the best prophylactic against disordered and pathological mental processes.

5. *Sympathy.*—The sympathy of the psychoanalyst is another factor. Sympathy in the form of pity or the like may be repugnant, but the more intellectual sym-

pathy that results from having another person in whom one has confidence understand and share in one's deepest trials and difficulties, is, in many cases, an important psychological element in effecting a cure.

6. *Stimulus to Thinking.*—The sixth factor is the reenforcement of the stimulus to a new course of thinking and acting, the new course of behavior in general, by the statement of the psychoanalyst in emphasizing the value of it, especially if he is an individual in whom one has confidence. Every one feels this reënforcement from the approval of one's opinion or one's action by another person, however humble. One feels it much more when the approval is by one deemed an expert in the matters in question.

7. *The Stimulus of Success.*—The stimulus that comes from success by the patient is still another factor. The mere discussion of one's feelings, the mere coördinated thinking in an intellectual, rather than in an emotional, way is for the patient a distinct success; and the ability to do certain things required by the psychoanalyst in itself constitutes success. The stimulus of this success in expressing one's feelings and in coördinated thinking is in many cases an enormously important factor in effecting improvement and cure.

8. *The Halo of the Supernatural.*—The eighth factor is likely to be the stimulus that comes from the halo of supernatural, transcendental worth which attaches to the matters treated by the psychoanalyst, especially, perhaps, where the infinite significance of the Unconscious or the like is emphasized. This halo of supernaturalism, consciously or unconsciously, is perhaps employed in most cases by the psychoanalyst.

The ingenuity and elaborate detail with which the Freudian philosophy has been worked out and the

psychoanalytical method of mental healing has been practiced is a remarkable fact, only equaled by the elaborate conception of the all-inclusive and all-potent character of the Unconscious which, according to Freud, lies back of all consciousness, is far greater and more significant and guides and controls it.

The Active Mental Response.—From a psychological point of view this elaborate philosophy of the Unconscious is hardly needed except, perhaps, to impress the patient, and give inspiration and enthusiasm to the psychoanalyst. This whole doctrine is at once romance, philosophy, and poetry. Psychologically, it does not matter whether it is true or not; but, just as the poet relieves his mental stress by writing a poem, so the patient who can share in the poetic imagination of the psychoanalyst is likely to find this a most wholesome and refreshing form of mental activity. Thus it takes no great psychological insight to see that the attitude of confession and active coöperation in the processes of psychoanalysis on the part of a patient may be most wholesome.

In like manner modern theologians hold that the attitude of prayer and dependence is wholesome whether or not prayer be objectively effective. Thus, too, the mnemonic teacher is psychologically sound in his method of requiring his students to think about what they would remember, associating certain things with the matter to be learned, however grotesque and cumbersome the particular associations they may employ.

As one great contribution of the Freudians is to show the need of normal reaction to feeling, so the success of their practice is due in part to the opportunity they give their patients for concrete and interesting reaction.

The Factors that Contribute to Cure.—From a psychological point of view, then, among the factors that contribute to cure in psychoanalysis the following are fairly obvious, as we have seen: (1) the fact that the patient is brought by this means to face reality; (2) the opportunity for normal reaction to feeling; (3) the stimulus of a new idea brought into the mind of the patient by the psychoanalyst; (4) the coördinated thinking that results; (5) the sympathy of the psychoanalyst; (6) the reënforcement of the stimulus to a new course of thinking by the emphasis furnished by the psychoanalyst; (7) the success in the mental field which the patient achieves by his new line of thought; (8) the stimulus from the halo of the Unconscious.

Most of these different factors may be summed up in one thing, namely, the doing of a task of such a character as to remove injurious inhibitions and concentrate attention in straightforward activity, and what is involved in this. Altogether, they furnish a personality threatened with disintegration with a form of coördinated and integrated behavior.

Self-Analysis.—In the light of concrete cases like that cited above and from the point of view of the psychology of the task, the more completely the patient himself does the work of analysis, the more effective the remedy. This is now recognized by some psychiatrists. Without subscribing to Brown's system, his words here may be considered. He writes:[2]

> In future—as it is, in my hands, to-day—analysis *should always be made first by the patients.* This recommendation will startle psychotherapists of the old school. Patients should be instructed never to force their thought, never to *try* to think, never to "make" themselves do anything. No

memory is improved by being "made." Many readers may think to the contrary, but further study and experience will show them that memory is an *automatic* affair of neurones, that when the state of the mechanism is satisfactory memory asserts itself—it just *comes.*

The advantage of this procedure is obviously two-fold; first, by not forcing the patient, certain inhibitions of his mental activity are avoided. Since the analysis of the physician must depend on the patient's own memory and response, such freedom from inhibitions of memory is necessary. Second, by letting the patient make his own analysis, the maximum benefit of performing an interesting task is obtained.

The Place for Psychoanalysis.—Psychoanalysis is a branch of psychiatry, which will not be treated here. The place for its practice is the hospital and the laboratory, not the schoolroom; but certain aspects of it illustrate important principles in mental hygiene significant for the school.

In its modern form it requires an elaborate technique, the guidance of an expert, plenty of time, plenty of money, and plenty of patience. It seems possible, however, to present some of its elementary psychology in simple form so that the layman with little time and with little money may have some of the benefit of it.

What the Psychoanalyst Does.—Briefly, what the psychoanalyst does is to find if possible the source in the individual's mental experience of the disagreeable or disgusting memory and attitude, then to bring it clearly to consciousness, lower the threshold so that one will think of it without repression, then associate a rival stimulus with the disagreeable memory, a rival stimulus of agreeable, or humorous, or idealistic character, which will serve to inhibit the disagreeable idea or attitude

itself. But the tasks given in the preliminary treatment of the patient are themselves helpful.

Thus, whatever the task and in whatever way it may be given, whether given as such, or indirectly as a preliminary to treatment, it is a valuable means of cure. Nothing, perhaps, shows this so emphatically and so pathetically as the cases of nervous and mental breakdown. The remedy, as we have seen, is simple, the giving of opportunity for a task; but the very thing the patient is afraid of is a definite task of any kind. The best physicians can only prescribe the remedy. It is for the patient to take it. This, in many cases, he cannot or will not do; and for not doing the task the patient always has a reason. The trouble is largely the lack of training in the doing of tasks in childhood.

The Need of a Task.—In such individuals who need more than anything else a compelling task, when, perchance, by force of circumstance a duty is forced upon them, the results are likely to be surprisingly beneficial. The following, perhaps, may serve as illustration.

At a recent term of a court in a Massachusetts district it is said that one of the jurors drawn applied to Judge Webster Thayer to be excused on the ground of serious nervous breakdown. The judge thought the man looked better than his report would indicate, and refused to excuse him. As a result he was forced to serve for two weeks, and the result was so beneficial that when discharged he was a different man physically and mentally. He had gained eight pounds, and his nervous condition was so improved that the judge was said to be ready to recommend jury service as a remedy for nervous breakdown.

For those who deem themselves incapable of doing a task, for those who will not try, and for those who are

interested in nothing but themselves, anything that induces them to take the remedy in some form or other will produce good results. Thus Coué likewise has given a task to a million. We are not concerned here with autosuggestion, although it is natural enough as a means of realizing determining tendencies that make for the health of an individual; but for those who are self-centered the mere counting of Coué's beads of autosuggestion may in itself furnish a task significant for the mental health.

Summary

1. Children are liable to form pathological conditioned reflexes in the home and in the school. These are, perhaps, specially liable to occur in the home in connection with food and digestion and in connection with punishment in the school. In all conditions of mental disorder the task is valuable as preventive or cure.

2. Psychoanalysis is a special branch of psychiatry, a subject for the physician and the hospital, not for the teacher and the school.

3. Certain psychological principles involved in the practice of psychoanalysis are significant both for pedagogy and for hygiene.

4. Unfortunate conditioned reflexes, habits, inhibitions and attitudes, repressed feelings, memories, and all the skeletons in the mental closet, have an unwholesome effect in causing confusion of association, mental conflicts, and disintegration of the personality.

5. By the method of psychoanalysis all such dissociations and inhibitions, trifling or extreme, are brought into consciousness and corrected, or themselves inhibited by the natural associations in the stream of thought.

6. In a minor way psychoanalysis is helpful because of the interesting tasks it prescribes for patients. For those who have nothing worth while to do—the poor with limited opportunity, the idle rich, the self-centered, or the blasé, or the depressed and the despondent, psychoanalysis furnishes a series of tasks in the treatment it gives. Just as in physical disease the taking of the medicine and regimen prescribed by the physician, with the attitudes and associations involved in it, has its value as a task, whether the medicine be a mere *placebo* or really potent, so active participation in the methods of the psychoanalyst has its value as a significant task in itself, whether the philosophy of the method be true or false.

Problems and Questions

1. Read some reliable account like the "Mental Health Primer" published by the Massachusetts Society for Mental Hygiene, and give concrete illustrations of neurasthenia, psychasthenia, and hysteria.
2. Report cases of other pathological conditions you have observed.
3. Give an example of a pathological conditioned reflex.
4. What can you suggest as means of preventing extreme pathological results such as suicide, in children?
5. Report examples that you have observed of the value of a task in cases of mental disorder.
6. When a child is especially active and emotionally unstable, would you infer that it has an unusually strong or a relatively weak nervous system? Would such a child need more or less sleep than ordinary children?
7. What treatment would you suggest for oversensitive children?
8. Read, if you can, the book by Adams on *Modern Developments in Educational Practice,* and then state what

you think is the contribution of psychoanalysis to school practice.

9. Why are the tasks given to a patient in psychoanalytical treatment likely to be interesting?
10. Give examples of mental conflicts, conscious or unconscious, that you are familar with.
11. Report illustrations, if you know of any, where people have been helped by the Coué method or similar tasks.

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CHAPTER XX

THE PRINCIPLES OF MENTAL HYGIENE

Is it possible to formulate any general principles in regard to mental hygiene beyond a mere statement of the essentials already noted—a task, a plan, and freedom? To many psychologists and psychiatrists any attempt to do this is not only rash but futile. We have not yet a sufficient nucleus of scientific knowledge in regard to mental health, and it is impossible to formulate principles where the essential data are not available.

This position is a safe one to take, but hygiene is a practical subject, and even if no general principles may be formulated, perhaps, at least, it may be possible to distinguish tentatively certain conditions essential for the mental health. If so, these must be conditions that concern the most simple and commonplace mental processes. They must be conditions that can be interpreted in terms of everyday experience, not hereditary characteristics, but conditions capable of modification by habitual behavior.

It takes considerable rashness, however, with our present meager knowledge, to attempt any formulation even of the conditions of healthful mental activity. Nevertheless, it will help, perhaps, to do this tentatively. A brief outline will bring the essential points together and serve as a résumé of the subject. Hence with a somewhat arbitrary division, and without attempting to show the overlapping and interrelations of these conditions,

we may note at least some of the most essential, as follows:

1. *Attention to the Present Situation*

The most fundamental of the higher mental functions is what we call attention. Although structurally attention means clearness, genetically and functionally it means a reaction of the organism comparable to the tropisms in plants and animals. The usual form of attention is response to a group of stimuli immediately present, what may be called the present situation. The type of *healthful* attention is everywhere attention to the present situation. So important is this for the mental health that one's ability to concentrate upon the present, ignoring the past and the future except as vitally related to the present, is, in a certain sense, a gauge of one's sanity. This was pointed out long ago by Janet, and the importance to health of living in the present was emphasized by Osler in his lectures at Yale. "Sufficient unto the day is the evil thereof," represents the soundest mental hygiene, and the danger of ignoring this is shown by modern psychiatry. Or, as Osler put it, "the freshest, the oldest, the usefullest" of all the rules for mental health is that of living one day at a time.

In the anxiety or *Angst* neuroses, for example, the patient worries about the past or has grave anxieties about the future. The beginning and the cause, as well as a characteristic symptom of mental breakdown, is the habit of doing things, as President Hyde has suggested, three times, which should be done but once: first, doing them in anticipation and dread; second, in the actual occurrence; and, third, in worrying about them after-

wards and regretting that they had not been done differently.

Attention in Times of Crisis.—When men are placed in primitive conditions where they have to meet the titanic forces of nature, the limitation of attention to the present becomes imperative. Primitive peoples do this. The civilized man may learn to do the same. Rasmussen, the Arctic explorer, for example, has reported how he found it necessary to adopt the Eskimo habit of taking rest when it offered and taking it thoroughly, and learned that "storm and misfortune must be slept through."

In times of great danger, as, for example, in the few minutes before the sinking of the *Titanic* or the *Lusitania,* and in similar crises, the normal man shows the best illustration of complete concentration upon the present situation. In all activities involving danger we get more or less clear illustrations. An example has been given by Coningsby Dawson. In the stress of the war he wrote:

"One lives only from sunrise to sunrise, but there's a more real happiness in this brief living than I ever knew before, because it is so exactingly worth while.

Attention in Dangerous Exercises.—Illustration of attention to the present situation is furnished by Beck in an article on the psychological influence of danger.[2] Whenever we are engaged in some physical exercise like climbing over cliffs, there is extreme concentration of attention on the present. The cares of the day are forgotten. Even injuries from tearing the hands on sharp stones or shrubs, or the like, pass unnoticed. The same is true of all physical exercises that involve danger. In fact, it is true of bodily exercises that do not involve special danger, such as fencing, wrestling, running, and

the like. In all of these there is concentration of attention on the present situation. The trained boxer, for example, exhibits an extreme integration of personality during a contest.

All such exercises, especially those involving danger, mean severe mental strain. As Beck sums up the matter, in these crises there is an unusual mental concentration, one of the greatest forms of mental strain we can conceive of, so great that the memory of it is not weakened after many years. Frequently, it remains clear for the whole of life.

For this reason such exercises are valuable means of recreation. When the danger is passed, or when the strain of attention in exercises where there is no danger is over, then there is a great feeling of relief, one is in a condition of mental rest, as in the early morning when one wakens out of a deep sleep. Beck suggests that it is due to this great feeling of relief, this reaction, that the most bitter enemies immediately after a duel are often ready to shake hands in reconciliation.

Such exercises that involve concentration of attention on the present situation are most admirable means of training to habits and attitudes of healthful activity. Not merely is the concentration of attention on the present itself a healthful form of mental activity, but it conditions normal reaction and relief after the crisis has passed, and, most important of all, perhaps, tends to develop integration of the personality, apparently removing for the time being, at least, unfortunate inhibitions.

Of course, the smug conventionalist will say that it is necessary to provide for the future and even a mark of higher civilization to work for distant ends. Nobody denies this platitude, but the present situation is always

related to future situations and to our knowledge of the past; our background of association determines for us subjectively what the present situation is, so that we cannot ignore the past nor yet the future in attending to the present, however hard we try.

It frequently happens that attention to the present, with the best possible response to the stimuli it presents, is the best preparation for the morrow and the more distant future. Whereas, on the other hand, the anticipation of the morrow and too careful preparation, especially in worry and anxiety, instead of being a real preparation, actually may unfit the individual for the future situation when it comes. Mental preparedness may mean inhibition.

Cardinal Newman's famous hymn:

> The distant scene, I do not ask to see,
> One step enough for me.

has meant support and sanity to thousands in the stress of intolerable bereavement.

It is, of course, desirable and quite compatible with the rule of attention to the present to have a definite and intense hope for the future. As Dawson, in one of his poems, has expressed it,

> Yesterday and to-day
> Have been heavy with labor and sorrow.
> I should faint if I did not see
> The day that is after to-morrow.

It is, however, extremely difficult to give attention to the present situation. The heartrending tragedies, sometimes even the pleasures, of the past, and many in-

sistent ideas from the past, intrude in consciousness; and still more often the possibilities of the future are so alluring or so alarming that we are unable to limit attention to the present. Thus the practical problem is by no means a simple one. The difficult situations are mental situations, and these are complex. Obviously, we have considered only part of the story, possibly the aspects of our subject that remain to be considered may throw some light on the difficulties noted.

One of the great problems of mental hygiene for the individual is the paradox between social and somatic hygiene on the one hand, and mental hygiene on the other. Children should be taught to work for distant ends, to be cautious, to deliberate, to restrain the impulses of the moment, to have prevision of the future. They should be trained to give up the pleasure of the moment for the sake of greater good in the future, to preserve their health by restraining the impulses and desires of the present, and thus to avoid injury and overstrain. Safety first is the great maxim both of social and personal hygiene. But when we come to mental hygiene, we find a fundamental principle apparently in conflict with all this, namely, the need of giving attention to the present situation.

Caution Is Often Worry.—The habit of forecasting the future, caution, deliberation, prevision, is apt to be really a form of worry. In the extreme cases of worry we usually find an hypertrophied bump of prevision and of caution. All this is distinctly unhygienic. Many a man and woman under the stress of great duties and responsibilities would be able to work better and without injury to health if it were possible to cast caution to the wind and act spontaneously with attention fixed upon the

present. Caution is a late development in the race; and with this development is correlated the tendency to nervous disorder and insanity. Thus the great problem in practical personal mental hygiene is the problem of solving this paradox between social hygiene and mental hygiene.

The Training of Children.—Children also should be taught to live one day at a time, to settle their moral accounts every night, never to hold a grudge, never to let the sun go down upon their wrath, to look upon each morning as a new day in which to improve, but not to carry over their troubles from yesterday.

When the school attempts to transfer their attention from their spontaneous interests to the more artificial scholastic interests, care should be taken not to weaken the natural habit of concentrated attention. Short periods, complete attention, no dawdling, should be the rule. While developing the power to work for more distant ends, attention should usually be focussed upon the present. The importance for education of concentration of attention has long been emphasized. For the mental health it is equally important. For the moment it represents *par excellence* integration of the personality.

In case of children, especially, the normal mental attitude is that of attention to the present situation. We all know how quickly the emotions of childhood pass, how brief are the child's sorrows, unless there is some chronic pathological neurosis. In other words, the carelessness of children that we complain of is one of the marks of sanity. Clouston, in his *Neuroses of Development* notes the reverse of this as one of the symptoms which may lead one to anticipate adolescent insanity.[9]

Distractions of Children.—My friend, the principal of a city school, assures me that all the children under his care are perfectly normal in this respect. They are not worrying about anything past or future. They are concerned merely with the present. This testimony is evidence of the remoteness of the teacher's mind from childhood rather than of the carefree condition of the pupils. We have abundant evidence that many children in the schools are worried about their lessons, their companions, or perhaps their home conditions. They are worried about many little things, grievances, misunderstandings, and the like, foreign and perhaps grotesquely absurd to adults, but nevertheless cases of real worry or fear to the children.

To-day with the distracting environment of children in perhaps most urban communities, they are likely to be distracted by many projects and exciting stimuli that cause a precocious forecasting of the future which results not infrequently in an emotional prodigality injurious to healthful development.

Only by living in the present can healthful development be insured. We do well to reflect on the doctrine of Schleiermacher, who taught that each period of life is significant for its own sake, and that we have no right to sacrifice one period for another, childhood, for example, for the period of adult life. With the usual aim of education, that of mental hygiene is sharply in conflict here. Of the former, Dewey says:[18]

> As traditionally conducted, it strikingly exhibits a subordination of the living present to a remote and precarious future. To prepare, to get ready, is its key-note. The actual outcome is lack of adequate preparation, of intelligent adaptation. The professed exaltation of the future turns out in practice a blind following of tradition, a rule of thumb

muddling along from day to day; or, as in some of the projects called industrial education, a determined effort on the part of one class of the community to secure *its* future at the expense of another class. If education were conducted as a process of fullest utilization of present resources, liberating and guiding capacities that are now urgent, it goes without saying that the lives of the young would be much richer in meaning than they are now (pp. 260-270).

The Child a New Being Daily.—To the child attitude of living in the present we often do gross injustice. The teacher's attitude toward pupils is almost inevitably determined by the past action of the pupils, frequently, even, by the past reputation of the pupils with other teachers. The conception of a child as a new being to-day progressing, as sometimes happens, so rapidly that he is practically independent of his behavior of yesterday, we can with difficulty realize from an adult point of view. Royce used to tell a story that illustrates this rather subtle, but important point.

A little boy who had unwisely shared in the killing of mice that were making depredations, found some little kittens, and, thoughtlessly transferring his destructive impulses, killed them. In the usual manner of adults he was perhaps more severely than discreetly reprimanded. A little later, again after the manner of adults, the boy was reminded of the tragedy with the kittens with reflection on his behavior. With the frankness of childhood, and with clear consciousness of his present rectitude, the boy pathetically replied, "I am not killing any little kittens now."

This principle of attention to the present situation is by no means a mere maxim. It is fundamental for all efficient mental activity and one of the prime conditions of mental health.

2. *Orderly Association*

Attention to the present situation implies orderly association, the next condition of efficiency and mental health. In all subjects and all methods of instruction and training, as seen in a preceding chapter, care should be taken to avoid all confusion and interference of association. Disorderly association means the beginning of mental conflict and worry. Tasks should be simple and definite, instructions clear and concrete, decisions and actions straightforward and whole-hearted. Thus habits of orderly association are developed. The means of securing habits of orderly association are, we have seen, proper training in simple straightforward reaction and concentration of attention. By training in the doing of definite tasks with concrete directions from teachers, and freedom for the individual child to think in regard to the plan, such habits may be developed.

The Desire for Serenity.—Some of the applications of this principle in the school have been discussed in detail. It should be added that most people try to avoid interference of association and occasions that present a problem, require decisions, or demand responsibility. The desire for clearness and straightforward action, and the avoidance of mental conflict, is so great that it becomes a ruling motive in human experience to an extent that hardly would be believed by one who has not made special study of mental hygiene. This, probably, in large part accounts for the attractiveness to many people of military forms of organization and dictatorial methods of government, whether in small groups or large. The soldier is free from mental conflict when doing things repugnant to his sensibilities because he

has granted once for all complete allegiance to the authority of his superior officers. The military forms of religious organizations illustrate the same thing. The members of the Salvation Army grant implicit obedience to their commanders, and hence are largely relieved from the mental storm and stress incident to individual decision. The Jesuit organization for centuries has had a peculiar attraction to a class of religious minds, probably for the same reason, because the individual can give up his own responsibility and have serene contentment, a mental state free from conflict, by implicit obedience to his superiors. And even the ordinary religious devotee, by implicit obedience to the word of the Scripture, or the rules of the church, or the like, avoids mental conflict and gains a similar serenity.

How strong this desire for clearness of vision and serenity of mind, has had noteworthy illustration among the great thinkers of the world. Immanuel Kant, for example, preferred to have his ethical decisions result contrary to his wishes because then he felt more sure he was right. And Huxley said that if an omnipotent being would agree to wind him up like a clock so that always on every occasion he would do the right thing, he would at once agree to the proposition.

The Reason for Convention.—Probably a similar motive is one of the factors that make most people so conventional. Convention is an economic device; to follow convention gives mental relief, and saves one from the mental stress of conflict and decision. A conventional response is easy, the line of least resistance. An independent response is difficult, sometimes laborious, often apparently foolish.

Children especially dislike confusion and mental conflict. They like definite tasks and clear instructions.

They like a teacher who is straightforward, concrete, definite, who keeps good order, and is not changeable. Most children, as well as adults, are apt to shirk responsibility, and they desire the mental serenity that comes from granting allegiance once for all to a strong and positive teacher.

3. *Mental Work*

The third condition of mental health and efficiency is the mental work itself. This is a part of the great law that function is a condition of further functioning. The nerve cells must function or they do not develop; mental function, as we have seen, is as important as physical function; and thus work or function is a most important condition for the mental health. The older hygienists sought to protect the individual from the evil results of work. They failed to see clearly that the great preventive of injury to the organism, body and mind alike, is to be found in work itself.

The Impulse to Activity.—The first great demand of positive mental hygiene is the development of normal habits of work. Of course, in dealing with children we meet instability and irregularity, and the problem is a complex one; but it probably would be a great help if, instead of suggesting that work is difficult and disagreeable, a duty to be performed, we should suggest that it is a pleasure and privilege. From the impulse to activity it is easy to develop habits of regular and systematic work without crushing out the instinctive pleasure in work for its own sake. Some time since, I asked a five-year-old friend whether he would rather work or play. Immediately he answered that he would rather work, because, as he said, he could play any time. It is a mistake to suppose that children do not

like to work; nothing gives them so great pleasure as the doing of serious tasks.

In children, as in animals, there is always danger that an instinct may atrophy if it is not developed; and also always danger of perversion. Thus the instinct to display energy may be developed merely along the line of play, or it may be perverted into bullying, teasing, fighting, and the like; or it may revert to mere fooling. It may be overdeveloped to a mania; it may crowd out all other instincts, even the instinct of sleep; or it may be perverted and degenerate to mere restlessness. It is not too much to say that the development of healthful habits of work is the safeguard of health, of sanity, and of morals; and no tragedy in education is comparable to that of the atrophy or perversion of this instinct of workmanship. Mental work is even more important than physical work.

4. *Alternation of Work and Rest*

The fourth condition of mental health is the proper alternation of work and rest. Erb[15] and some of the older neurologists have maintained that the most important law in the hygiene of the nervous system is this law of proper alternation of periods of work and rest; and it is not too much to say that suitable mental work is never injurious if it does not last too long and is followed by an adequate period of rest.

Kraepelin, the great psychiatrist, has dwelt on the importance of proper periods of rest, and, recognizing that normal attention always involves alternating periods of work and rest, shocked the German teachers some years ago by saying that the child's inattention is his salvation, and uninteresting teachers an hygienic necessity. He has noted also that the way in which an in-

dividual spends these periods of rest and inattention conditions in large degree his efficiency in mental work.

Rhythms.—Although this principle is fundamental in importance and familiar to everybody, certain less obvious applications of it are relatively little known but perhaps of equal significance. Recent investigations suggest that certain deep-seated periodicities in human activity should be regarded in perhaps all forms of work both physical and mental. The shorter as well as the longer rhythms of functional activity probably have their importance for both health and efficiency. This is indicated by ordinary observation and by scientific studies.

Both experiment and common observation show that a tendency to rhythmic activity is a law of our nature. The smith, the carpenter, the thresher, the oarsman, keep time at their work. The soldier marches more easily and courageously to the sound of music. The life of the well man is divided into alternate periods of labor and rest. The sick man's attacks recur at regular intervals. We group all continuous and uniform sounds in rhythmic form. One can scarcely count without a rhythmic accentuation by twos or threes. And a careful ear detects the rhythmic articulation of our ordinary speech. In nearly all psycho-physical experiments this rhythmic tendency appears. The attention seems to ebb and flow in rhythmic oscillation. A certain interval between the signal and the stimulus gives the shortest reaction-time. Impressions can be reproduced best when given at a certain rate per second.

Coleman, from extended studies of animals and men, finds evidence not only that muscular activity, voluntary and involuntary, has a strong tendency to be periodic, but that the rhythms of the several funda-

mental activities, pulse, respiration, stepping, chewing, are usually in accord; that suppressed emotional excitement brings rhythms to an end; that attention to periodic sensory stimuli often brings the bodily activities to the same rate; that a form of self-consciousness is brought on by discord of rhythms; and that the heart often serves as a timekeeper and pacemaker.[10]

Conformity to Normal Rhythms.—Although little is known about this whole matter, conformity to a normal law of rhythm is apparently of great hygienic value; and probably in the control of emotion a coördination of the fundamental activities of the organism, especially pulse, respiration, and perhaps of attention, would be of great value in the development of habits of work both physical and mental. In many animals, and perhaps in case of most men, lack of harmony in the rates of fundamental activities are likely to cause excitement, waste of energy, and undue fatigue. Coördinated rates of activity will probably be found among the important habits of healthful and efficient work.

5. *Normal Reaction to Feeling*

Normal reaction to feeling appears to be essential for the health of the organism, otherwise pathological, protective attitudes arise. This is shown by the ordinary observation of everyday life and is written in large letters in the literature of psychiatry.

The Necessity for Reaction.—As has been emphasized throughout, optimum stimulation and response are necessary for the health of the individual. First of all, this is illustrated in the most fundamental functions of the human body. The pressure of the feces upon the intestines, of the urine upon the bladder, make the reaction of evacuation imperative. If unfortunate

circumstances make this impossible or cause delay for a long period, the distress is almost intolerable and the injury to health liable to be extreme. When the condition of one's organism and the nature of one's environment furnish the right stimuli, the reaction of sleep is almost equally imperative. In all such reactions of the physical organism this fundamental law of hygiene is illustrated. Although often ignored, the law seems to be equally imperative in the mental field.

The whole history of mankind, as well as the personal history of each individual, illustrates this. The primary impulse to the great activities of human life, the primary impulse to war, to the masterful works of industry, to the conquest of nature, and to all the achievements of human ambition, has been this imperative necessity to react to the great human impulses. In the individual child the great fundamental instincts—the impulse to activity, fear, rage, love, and the social instincts are the great motive forces. It is a strange thing that we so largely seek to thwart these forces instead of giving them opportunity for legitimate function.

The vigorous explosion of nervous energy seems to be an essential for thoroughly normal functioning. Excitement even seems to be necessary. Only those who could endure excitement have survived in evolution. The human race has come up through excitement of every kind. Excitement within certain limits seems to be normal and hygienic. It is a tonic to the mind like vigorous exercise for the body.

Commonplace Illustrations.—The significance of normal reaction can be shown only by many concrete illustrations. It is instructive to recall a number of familiar examples from normal life. Their significance is the greater because they are so commonplace. A mosquito

on one's hand, a draft on one's neck, a bit of dust in one's nostril, any and all of such stimuli make an imperative demand for reaction. Some of the more striking of the common stimuli have been cited as examples by Sutherland, who says:[81]

> There are thousands of well-known facts which force us to the conclusion that our nervous systems are most delicately susceptible to emotional states arising from external stimuli that have no sort of apparent cogency. A strong man will in vain endeavour to sit quietly near a boy who loosely scrapes a slate-pencil on a slate. The sound of saw-sharpening irritates most people, and Vogt says that with a saw and a file, men can put the beech marten into so ungovernable a fury that it darts from its nest and is easily caught in nets. A barrel organ can almost kill one man with nervous irritation, while the bagpipes send another into absolutely furious moods.

After training we see a similar need for reaction to acquired habits and tendencies. The fire horse or cavalry horse must go through his drill; the housewife must pick up the scraps of paper on the floor, the economist must save his string by untying knots, the teacher must mend your manners, the purist must correct your grammar. A forgotten task demands a reaction out of all proportion to the issue at stake.

The need of normal reaction is especially true of those stimuli that especially involve the feelings and emotions. By analogy, we may speak of memories and associations that excite feeling as mental stimuli, and to such stimuli of affective character, normal reaction is vitally important. In the school, as everybody knows, with the best of care by the teacher and with the greatest permissible freedom, many of the child's instinctive reactions are, nevertheless, inhibited; and a part of the

aim of school training is, as we have seen, to check habitual reactions in certain lines and develop special responses favorable to the educational tasks imposed. In groups of individuals similar checks to instinctive reaction inevitably occur.

Group Repressions.—Every professional group illustrates this repression. The words that Miss Abbott puts into the mouth of "The White Linen Nurse" express the revolt of many in other callings against the repression of feeling and individuality by professional conventions:

I tell you, I just can't breathe through a trained nurse's face any more. I tell you, sir, I'm sick to death of being nothing but a type, I want to look like myself. . . . When other women are crying, I want the fun of crying. When other women look scared to death, I want the fun of looking scared to death.

The Safety-Valve of Free Speech.—Wherever men are gathered together in groups, we find this need of reaction to feeling. A typical illustration was afforded by the long Republican convention held in Chicago in 1912. Bryan, who, although deluded in his biology and a sentimentalist in his philosophy, is, nevertheless, an expert student of people in groups, acted as newspaper reporter and described the extreme tension during the early part of this convention and the relief later on. He said:

When the credentials committee attempted to rush the contests through, giving only a few minutes to each, there were angry protests and threats of a bolt. Finally the committee conceded time—as much time as the minority wanted—and as a result an explosion was averted.

Men had a chance to testify to the "outrage" that had

been perpetrated on them; speakers had an opportunity to shout their anathemas at the committee and to warn those responsible of the wrath to come. Some had a chance to demand a roll call, and a few availed themselves of the privilege of saying, "Mr. Chairman, I demand to poll the delegation." . . . There is nothing like debate to smooth out the troubles of a convention. The men who invented gag law did not understand the pacifying influence of sound as it passes out of the throat. . . . I am firmly convinced, by long attendance at conventions, that there are few sorrows of a political nature that free discussion cannot heal.

This is the secret of the wisdom of free speech. The need of normal reaction to feeling and the perversions likely to occur when this is blocked, indicate from a psychological point of view what has been shown in innumerable instances in history. Nothing, perhaps, has been a better safety valve in London than the freedom of Hyde Park and other places where anybody could speak on any subject under heaven, and even berate the Royal family to the full extent of one's vocabulary; or Boston Common in this country, where one can hear on a Sunday afternoon vigorous discussion of many themes, sacred and profane.

Wilson maintains also that limitation of proper reaction is an essential condition of the emotion of fear. He writes, for example: [35]

Frighten a crow and it croaks and flies, alarm a deer and it snorts and gallops; but the human mind, a consciousness doomed to offices and back parlors . . . has no such outlet. The startling activity that courses along the sensory nerves of a man or woman who is afraid simply circulates until it is spent, unless the mind hits upon some device, however inane, that seems to promise safety . . . an essential factor in fear is the limitation of proper conduct. . . . In all such

states there is an overactivity of impressions and a limitation of voluntary modes of expression. Impressibility, in certain circumstances, painfully in excess of appropriate response, is part of our organic heritage.

Repression as a Cause of Fear.—The checking of normal reaction leaves an attitude inhibitory, or at least not adjuvant, to the tasks we have to perform. Graham Wallas [33] notes the complexity of the problem in civilized man and deems the trouble to be largely the contrast between our dispositions inherited from a primitive environment and our present condition of civilized life. He says: [33]

In civilized man the relation between disposition and stimulus is most complex. Man is born with a set of dispositions related, clumsily enough but still intelligibly, to the world of tropical and subtropical wood and cave which he inhabited during millions of years of slow evolution and whose main characteristics changed little over vast periods of time. . . . In our own time an environment has been created in which for most of us neither our instinctive nor our intelligent dispositions find it easy to discover their most useful stimuli. . . . Each disposition balked produces a nervous strain of which the individual himself is unconscious.

Freud and his school have given many illustrations of the unhygienic effect of this repression of feeling and of the various methods of protection and the like that both normal and pathological individuals are wont to resort to when repression of the normal reaction occurs.

A Psychic Lesion.—A repressed complex of associations of emotional character acts as a foreign body in consciousness, a psychic lesion. In cases of nervous

disorder, like the various anxiety neuroses, remarkable cures are often effected merely by bringing the repressed complex into clear consciousness and by the expression of the same in words. In an hygienic sense confession is good for the soul.

We have noted one of the paradoxes, as we may say, of culture. Mental hygiene demands that our thinking should be straightforward and natural, that our associations and recollections should be free and unrestrained, that the stream of thought should flow without artificial checks or interference, and that feeling should be expressed by natural reactions. But the whole course of training and of education is largely repression. Natural and free reactions as the expression of feeling must be inhibited or postponed. Even spontaneous and natural associations must often be checked. Impulses and desires and the resulting associated memories must be controlled or suppressed, and in a hundred ways the natural and spontaneous mental processes are supplanted by conventional rules and opinions. Thus it comes to pass that the educated person not only does not dare to act as he feels, but he does not even feel and think in a natural way, because such a large part of his association complexes are repressed by traditional and artificial conventions. The outcome of modern psychiatrical investigation points to all this repression and artificiality as one of the causes of modern nervousness and mental disorder. Hence the need of training in mental hygiene to give necessary self-control without inhibiting natural reaction and normal adaptation.

Children especially should be given opportunity for normal reaction to their natural instincts and impulses —to be active in play and work, to sleep at need, to express their emotions, not only to assert themselves, but

to serve others and coöperate with them. Function, response of stimulation, action, work, represent the first condition of mental as well as physical health.

6. *An Active Attitude*

The sixth condition of mental health is an active attitude in the face of difficulties. The trying situations of childhood, "when a feller needs a friend," the occasions of worry, of fear, and rage, represent opportunity for the most important training. The physiology of these emotions indicates the hygienic response. As indicated by the investigations of Cannon [7] and others,[29] an increased secretion of adrenalin into the blood serves as an emergency call; all the energies are mobilized for action; an increase in the heart rate, an increase in blood pressure, an increase in sugar secreted from the liver, the stopping of digestion—as a process of secondary importance that can wait for the time being—are some of the provisions. Everything is prepared for action. Vigorous action is normal. The repression of action probably means short-circuiting and nervous strain. Normal activity for a child on occasion of fear, for example, may be to run away from the object of emotion or to attack it. The latter is morally better and usually safer and more healthful. By attempting always to meet a difficult situation, a habit of the utmost importance for the mental health is soon developed.

7. *Control*

Children should be trained to control their activities and impulses. Natural and helpful control is not by repression and direct inhibition, but rather by indirect control. We control one muscle by contracting an antagonistic muscle; we control one action by doing

something else, one interest by developing other interests; we stop thinking of one thing by thinking of something else. Control means the utilization of the nervous energy in developing a new and healthful form of activity that may take the place of the unwholesome activity. Every interest is potentially a means of self-control.

One of the virtues that should be developed for the sake of the civic character of the American people, as well as the mental health and character of the individual citizens, is this of self-control. Many years ago, speaking at Harvard, Sir Edwin Arnold pointed out this need in substance as follows: Gentlemen of Harvard, in 1775 and 1812 you conquered your fathers. In the years from 1861 to 1865 you conquered your brothers. Will you permit an Englishman to say that your next victory should be over yourselves." Since that time in the experience of the World War the young men of the nation have in part learned to control themselves, but the need for self-conquest is still great both for individuals and for the nation. Peace gives opportunity for such training quite as well as war.

Of course, from one point of view, control means everything in mental hygiene. It is almost synonymous with integration of the personality, it means coördination, whole-heartedness and unity. It is fully developed only by the education and training of a lifetime. It means the control of injurious emotions, inhibitions, and unwholesome mental attitudes, and, on the other hand, the development of wholesome conditioned reflexes and habits, concentration of attention and orderly association in the mental field, and the development of many and significant healthful interests. Another means of self-control is furnished by substitute responses, as al-

ready noted. The mental response of the gentleman may be exactly as effective as the profanity of the boor.

8. *Confidence*

The confidence that results from action and an ordinary degree of success is an essential condition of mental health. In the doing of tasks of every kind, in school activities and accomplishments, forms of skill of every kind, the need of confidence is seen. In swimming, in boxing, and in similar forms of physical exercise, the great step in advance comes when the learner acquires confidence. Although this is known by every teacher of physical training, it is often strangely neglected by the teachers of scholastic subjects. In all forms of learning, however, this attitude is essential. The long tale of failure, discouragement, and the sense of inferiority among pupils in the schools merely makes emphatic the need of the positive attitude of confidence which comes only from success.

9. *Normal Social Relations*

The ninth condition of mental hygiene concerns normal social relations. It is better for a child's mental health to eat and play and work and study with other children than alone or merely with adults. To act with others as follower or leader, to serve, to coöperate, on occasion, to resent, or to fight, represent healthful attitudes and healthful forms of activity; to deceive, to act cruelly, to be suspicious, to hold a grudge, represent unhealthful as well as unsocial mental attitudes. The only child in a family and others who have lacked opportunity for social development, should be given special training

10. *Adjustment*

Although adjustment to the environment is the one thing that sums up all the conditions of mental health, this is made clearer by noting all the characteristics of mental health; and adjustment of society to the individual is desirable as well as adjustment of the individual to society.

In the long run, the mental health of an individual depends largely on obtaining the proper balance between one's strength and the demands of one's environment. As Adolf Meyer has shown, many children will develop into useful, healthful members of the community if too great stress is not placed upon them, but drop into the class of the mentally unsound or defective in a too strenuous environment.[24] Hence this principle demands the proper adjustment of society and industry to the individual variations in ability and energy, and for the individual the solution of the problem of adjusting one's self to one's environment and one's work to one's ability and energy.

The Need of Balance.—So it is with everyone. All of us can endure a certain number of antagonistic attitudes and the like, all of us can bear a certain amount of strain, but if the strain passes that limit, any one will break down. Thus, as Meyer has pointed out, it is essential for everyone that there should be a proper balance between one's environment and one's mental endurance. On the other hand, the degree to which an individual can adjust to a given environment depends upon individual capacity. Lombroso's law of inertia in the mental world is not an empty generalization, for it gives the clue to much of human behavior and many of the apparent peculiarities of human thought. In every-

thing the normal mind tends to adjust, to abbreviate, to eliminate, to economize. As soon as we acquire an accomplishment, whether of motor skill, or the mastery of any subject in the mental field, we at once attempt to short-circuit it by dropping out the less essential steps in the process. Again we abhor change, elaboration, the necessity for making decisions, etc.; hence the desire for fixed forms, for symbols and the like.

Inertia and Adjustment.—There is an active principle also. Lombroso's law of inertia might be sufficient were it not that the human organism is a functioning organism, and for that reason another term is better for generalizing normal activity than the law of inertia, namely, the term adjustment. This, however, is modified in a significant way by the law of inertia because, as we have noted, we dislike effort and attempt to do things in the easiest way. This is well illustrated among primitive peoples. As McGee has pointed out, it is mental activity and effort of the will which primitive people abhor rather than physical effort.[8] In the mental activity of every one of us we have innumerable illustrations of the way the law of inertia has an influence. For a single illustration recall a concrete case of adjustment in your own experience.

Why is the annoyance caused by a change in one's plan for the day's work, for a journey or the like, usually so out of proportion to the material difficulties caused, and the significance of the issues involved? It seems to be chiefly because of this law of mental inertia, which makes us loathe to give up a decision once settled upon, a *parti pris*, a plan to which we have once consented. When once we have made the necessary mental readjustment, have reconciled ourselves to a change of plan, have settled down again, the annoy-

ance seems petty, and often we note with surprise the advantages of the change.

11. *A Normal Sense of Dependence*

The eleventh condition of healthful mental activity is a normal sense of dependence. This, perhaps, is the essential psychological element in religion—a sense of dependence on a supreme being or on the beneficent laws and forces of nature, or on the moral strength of humanity, or the categorical undebatable authority of duty, or one's sense of honor, absolute and worth while for its own sake. If not tampered with, this seems to develop normally in children; first, as dependence on one's own parents, later, as dependence on something higher. The adult's duty in regard to this is chiefly negative—never to cast any reflections upon the parent, or the child's religion, or sense of duty, this sacred shrine of the child's moral life; never to ask a child to act contrary to his conscience or to do a thing contrary to his sense of honor.

The Normal Determined from the Genetic Point of View.—What is normal here as elsewhere can be determined only from the genetic point of view. For the child, dependence on the parent is normal. A survival of this attitude of childlike dependence in adult life is a symptom of a psychopathic mechanism. Again, dependence on one's teacher is natural and normal, but with maturity this should be outgrown. And so in all stages of development the normal can be determined only by the genetic method. Few studies here have yet been made, but it is clear that the normal sense of dependence is relative to the stage of the individual's development.

12. *The Scientific Attitude*

The most important condition of mental health, the most potent factor in integrating the personality, the most difficult attainment of the human mind, a condition involved in and developed from the first condition, that is, attention to the present situation, is the attitude of facing reality. This applies to all men everywhere, in all situations; but it is a hard saying. To face reality is hard enough when we know what it is; but in a world like this, with its kaleideoscopic interplay of conditions and events, we often do not know what reality is, so that for the individual in practical life, what seems a difficult but simple attitude becomes one of facing complexity, suspense, problems, mystery. While in its simplest form it means facing a definite situation, it soon develops into an attitude of trying to find reality. In the child at school we call it the learning attitude; for the scholar, the scientific attitude; for all it means the spirit of the learner.

The scientific training itself is distinctly in the interest of the mental health; but this attitude is repugnant to certain tendencies in human nature, especially the tendency to follow the law of inertia, to hide one's face from disagreeable things, and to avoid difficulties; and it requires a large amount of training to develop it; seldom does it control altogether one's emotional reactions; most rarely of all perhaps does it transfer from one's own special subject to other fields.

The Need of Facing Reality.—In books on mental hygiene this is usually referred to as the attitude of facing reality. It is here called the scientific attitude because in this we have the highest development of the

normal mind in its willingness to face reality; and not merely in the limited field of science so-called, but in hygiene, medicine, education, and business, the aim should be to develop this attitude.

It requires little reflection to show, moreover, that the spirit of the learner, or the scientific attitude, is a prime essential of mental health and normal mental development. While in the early years this means open-mindedness, and the attitude of the learner, it develops into a habit of always correcting one's thinking by reference to the facts of experience. It means not merely use of the scientific method, first-hand observation, study and experimentation under controlled conditions, and verification; but it means a general attitude toward life and toward the world. It means the control and correction of emotional reactions and the vital insight that, after all, our feelings have nothing to do with facts, except in so far as they themselves are significant mental facts.

The Scientific Attitude for Children.—Even in the early years of school life this is an attitude to be emphasized, and children should be given a wide acquaintance with the facts of experience. The formal studies of the school, arithmetic, for example, are given more successfully and more healthfully as regards mental development if the child has first an experience in the concrete facts of nature. And it is a matter of hygiene, as well as of sound pedagogy, to develop this scientific attitude or lay the foundations for it in the early years. This should be remembered in all methods of instruction and training. From the outset children may be trained to correct their thinking by reference to objective facts, to recognize that what they think or imagine does not alter reality, that their own feelings have nothing to do with the facts.

Subordinate Principles

If we should analyze these different principles of course they might be subdivided into many others. Dr. Richard Cabot of Boston, for example, has recently pointed out the need of perspective as a condition of mental health.[6] Just what he means by this I do not know, but obviously one thing involved in mental perspective is the ability to ignore unessential elements in our processes of thinking. This need of ignoring the unessential is the counterpart of the need of attention to the essential and of orderly association; one must focus attention on the essential in order to avoid interference of association.

Again, the principle of normal reaction to feeling might be subdivided into a number of others, especially, as we have noted, the normal physical reaction on the one hand; and, on the other, a normal mental reaction, which in many cases may act as a surrogate of the physical reaction. Again, the principle of the proper alternation of periods of work and rest includes of course all forms of activity from the ebb and flow of attention to the extreme excitement before and the relaxation after the explosion of energy in emotional crises.

Such are some of the essential conditions of mental hygiene. As outlined, they overlap somewhat, and are interrelated. On such simple things, to the ordinary person simple, to the psychologist complex, largely our mental health depends. They touch all the details of everyday work in the home and the school, all matters of discipline, instruction, and learning.

Practical Rules for Mental Health

The principles or conditions of mental health formulated above are, I am confident, in harmony with the mental hygiene practiced by the best psychiatrists. For example, Riggs has formulated an excellent code of rules in substance as follows:[28]

(1) Neither run away from emotions nor yet fight them. . . . It is like guiding spirited horses—you guide, they obey, not their own impulses, but your will.

(2) Be efficient in what you do. . . . In short, do not drive your tacks with a sledgehammer. There is a better, less fatiguing way. Find out how easily you can do things well, and take pride in such skill.

(3) Do one thing at a time.

(4) Make clean-cut practical decisions. . . . Finally decisions must be valued, not as irrevocable oaths or unretractable contracts, but as mere decisions, subject to change in the face of new facts or additional knowledge.

(5) Do not accept hurry as a necessary part of modern life. . . . Quality of work, not quantity, spells success, and quality is destroyed by hurry.

(6) The worst enemy of efficiency, as well as the best ally of nervousness, is worry. Worry is a complete circle of inefficient thought whirling about a pivot of fear. To avoid it, consider first whether the problem in hand is actually your business. If it is *not*, turn to something that is. If it *is* your business, decide next whether it be your business *now*.

(7) Keep work, play, rest, and exercise in their proper relative proportions; not only in the space of decades, but year by year, month by month, week by week, and day by day. . . . Such a life absorbs emergencies without strain.

(8) Shun the New England conscience.

(9) Energy is often wasted by a peculiar process which many people seem to think necessary before they can do anything, especially anything that promises to be difficult. . . .

When a decision has been reached, when something has to be done, waste no time in mobilizing extra energy, just do it.

(10) Lastly, to avoid breaks in character, breaks between your ideals and your everyday actions, recognize that your problem is fundamentally the same as every one else's, no matter what your particular job may be. . . . Do not criticize your part in the play, study it, understand it, and then *play* it, sick or well, rich or poor, with *faith*, with *courage*, and with proper *grace*.

All these are best described as conditions rather than causes, since the causal relations of these different factors are only inadequately determined, and the relative significance and the interrelations of them are not altogether clear. The discussion of these conditions in their causal significance would require an intensive study and analysis of just what each signifies in relation to the others and to the general aim of healthful activity and development, a study, however valuable in itself, not necessary for our present purpose.

The Practice of Hygiene Difficult

To state these principles is easy, to practice them difficult, and to train children to practice them, a task for the greatest artist. For a teacher to do this demands more than constant care and effort; it requires constant self-repression; for healthful mental and moral fiber is built up by a child's own effort, not by the activity of adults. It requires suggestion on the part of the latter rather than demonstration, example rather than exhortation, sympathetic guidance rather than blame, and, in general, training rather than talk.

The child who has normal habits of reaction to his impulses and feelings, who has many interests and the power of self-control furnished by them, the ability to

concentrate attention on the present, habits of orderly association, an active attitude in the face of difficulty, a developing purpose for service and coöperation, and a sense of dependence and unsullied honor, and, withal, an integrated personality, is not only sane, but prepared for happiness, efficiency, and mental health.

Problems and Questions

1. Why is it desirable tentatively to formulate the conditions of health without waiting for adequate investigations?
2. Recall Sherrington's illustration of normal integration of the personality.
3. Would you modify the rule of attention to the present situation in view of the need of prevision for the future?
4. If you personally have had experience of crises involving great danger, was your mental condition one of concentration of attention or the reverse?
5. Report examples of interference of association from your own observation or experience.
6. Give examples of exercises or forms of training that tend to develop habits of orderly association.
7. Give illustrations of the advantages of a normal rhythm in one's work.
8. Report any concrete cases you know of injury to the mental health from extreme repression of feeling.
9. Report examples of substitute forms of reaction or sublimated forms of reaction to feeling and emotion.
10. What is the value of an active attitude toward difficulties?
11. Mention any other general conditions of mental health besides those mentioned in the text.
12. In what way, if at all, from the genetic point of view, would you modify the conditions as formulated here?
13. Translate these general conditions into concrete rules for the school activities of children.
14. Show the relation of these conditions of mental health to the scientific attitude.

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CHAPTER XXI

SUMMARY AND CONCLUSION

THE function of the nervous system is to make protoplasmic connection between the receptor and the effector organs. Thus, primarily, as pointed out by James, it is a mechanism for converting stimuli into reactions. The nervous system has also the great function of coördination and in its higher development the function of association. With the development of the new brain, the neëncephalon, the rudiments of which appeared in the selachians, came the power of association, which increased along with the evolution of the cortex until in the human being both reach the acme of their development. We find no dramatic beginning of associative memory; but, when any species did acquire this power, it became possible for the animal to profit by its own experience. Learning became possible.

We have taken one form of association, namely, the association of stimuli, for illustration. The other forms of association and of learning have been considered only incidentally.

With the development of the power of association of disparate stimuli it became possible to acquire reactions to stimuli that before were indifferent. With the development of the nervous system and this power of association, the development of integration at higher levels became possible.

In the individual, integration and the power of ad-

justment may be developed, physically, by coördinated activity, and mentally, in the doing of purposeful tasks. By the doing of tasks mental attitudes are developed, and they, together with inherited tendencies, determine behavior. Hence they are called determining tendencies. Any stimulus that touches off a determining tendency is called suggestion. The function of education and the function of the teacher are largely suggestion.

Although the activity of an organism is determined by stimuli internal and external, this is only half the story, because stimuli are often in conflict, and in coordinated activity inhibition is as important as stimulation. As often pointed out, they are two halves of the same whole. In biological development we find the two together; in all neural activity we have both stimulation and inhibition. In mental activity the same is true; and in education stimulation and inhibition are both necessary. Our behavior, as James used to say, is the resultant of our impulsions and our inhibitions. Thus we have the overinhibited type and the underinhibited type.

Evidence has been cited for the view that the integration of the personality that makes right adjustment possible is the essential characteristic of the normal mind. An integrated organism is a whole of interdependent parts, not a summation of parts, a whole that is more than the sum of its elements. Tentatively, the thesis has been maintained that the child's mind, like its physical organism, is integrated from the start, although at a low level. It reacts as a whole to its environment.

The ordinary conception of childhood may well be doubted. While the child is different physically and mentally from the adult, and while both mind and body

are undeveloped, it may nevertheless be found with further investigation that the child's personality is better integrated, at least after the second year of life, when the connection between the new brain and the old brain has been made and the function of association in the cortex developed, than that of the adult. Integration may occur at different levels, and it is not incompatible with a low stage of mental and physical development. It is a functional concept. This is not in conflict, but in harmony, with the view of habit given above, the need of breaking down old habits in the building up of higher habits, and of unlearning in the process of higher learning. All this reconditioning is reintegration; for the organism acts as a whole. Like growth itself the process ever begins anew, and in normal children at ever higher levels.

Apparently the evidence shows, as Koffka maintains that psychogenesis begins with wholes and with integration.[14] In child psychology, however, the theory still survives that its mental processes begin with a chaos of elements, the child's blooming, buzzing confusion, as James called it; and education apparently has never become quite emancipated from the old view of the child as bad and the belief that the function of education is to redeem the child and make him good.

Naturally, if the child itself is an integrated organism, it need not surprise us to find that its perception of objects begins with the perception of wholes. For this view there is much evidence, Köhler and Koffka have collected this from the investigations of children and animals, although it cannot be cited here.[14] A typical example is the observation that Miss Shinn made on her niece. This observer reports that the child at the

age of 25 days had no interest in simple colors, but did have in the human face as a whole.

From the very first of a child's mental development the process is from wholes to parts, or, from what Köhler calls the *Gestalt* to the parts which belong to it. As phenomena, a man, for example, does not exist for the child as made up of organs, but the organs belong to the man. The same is true of many primitive peoples. In their languages one cannot say a hand, but a hand is always designated as the hand of somebody.

It is interesting to recall that in the study of the conditioned reflex Pavlov found that the conditioned response at first is to general rather than to special stimulation. At first the dog responds to associated stimulation of the skin by scratching, with a secretion of saliva; and like stimulation of other parts of the skin gives the same response. Afterwards, however, the process of analysis occurs, and the characteristic response, the flow of saliva, occurs only on stimulation of a definite locality; and in like manner auditory stimuli are analyzed, response at first to a whole, with response later to the differentiated stimuli of definite tones.

If this new theory should prove true, then the special effort in the mental hygiene of childhood should be to preserve the integrity of the child; above all to avoid all the distracting and disintegrating conditions of education, and protect from any form of education that tends to destroy the very characteristics and modes of reaction necessary for the mental health, the things, in a word, that we try so hard to develop in our reëducation of cases of mental disorder. Renewed emphasis will then be placed on freedom for the child in the doing of his own tasks; the need of mental hygiene at the two great epochs of development, early childhood and adolescence;

the preservation at all costs of the integration of the personality which already exists in childhood; and the giving of opportunity for worth while tasks and legitimate self assertion at the period of adolescence, again to give freedom for reintegration of the individual personality.

We have presented the accepted doctrines and used the common terms speaking of the survival of childish attitudes and emotions. The point, however, may well be raised whether this does not do injustice to childhood. At least, there is another side to this. The normal child is really normal, not bad or pathological in its mental and moral condition. Many of its traits should survive. When we subtract the mental attitudes we have taught children, by our own example, how many remain that are undesirable?

To speak more concretely of the child's attitudes that are normal and should survive, it may be noted that the child is trustful and not suspicious; is free from fear except fear caused by violent change of stimulation, a loud noise, for example; is free also from anger except when bound or limited in its activity, where anger is really a defense reaction of its already integrated organism; is free from injurious repressions and inhibitions, from self-consciousness and the vast number of interfering and inhibiting thoughts and feelings related to self that constantly interfere with the adult's activity; has an optimistic attitude toward life, and usually a sense of humor; gives attention to the present situation, and, in its own activity, is orderly in its associations. The child exhibits its highest form of integration in conscious attention. It delights in expending energy in motor reactions involving the whole organism; and in the doing

of its own freely chosen tasks, shows an integration well nigh perfect.

Thus along with our negative hygiene, which attempts to remove the repressions and inhibitions and infantile attitudes that represent survivals from childhood, we should now develop a positive hygiene whose aim shall be to preserve the integrated habits of attention, the attitudes of work and play, from the child's world. An adult who can work with a child's whole-hearted attention, who in hours of recreation can drop back into the child's attitude of play, who can find his wages in his work without distracting thoughts of pay or scholastic reward or tokens of honor, or even the need of defending his own personality, has an asset for the mental health no negative precautions can equal. Mental hygiene, like somatic hygiene, began with the cure of disorder, and with negative precautions; but it has now advanced to positive hygiene and prevention. A form of prevention that preserves the healthful attitudes of childhood is vastly more important than the negative hygiene which has to be brought in to atone for the faults and sins of early education by eradicating childish attitudes that are disintegrating and pathological.

To child and adult alike the most disintegrating influence is that of uncontrolled emotion. The wish of a child known to the writer, that we did not have feelings, has been echoed by many adults. Among the causes of distintegration to-day are failure in one's work, failure to be understood, disparagement of the personality, exposure of one's real faults, slights of "the dear ego", injustice, reflection on one's honor, and the like. With these, emotional complexes are likely to be formed and the beginnings of mental disorder develop.

Cannot control of feeling be acquired while retaining

a normal affective life? With increased knowledge of endocrinology a better hygiene of feeling will be possible. Meanwhile mental training helps. It has been pointed out that a direct reaction or some fitting surrogate is always possible. And an objective mental attitude toward feeling can be acquired. Children can be trained to react at first to their feelings by searching for the facts of the situation and taught the truth of the French maxim: *tout comprendre c'est tout pardonner.* They can be trained in work and play and group activities, taught that to give way to feeling disintegrates the personality, that it marks the behavior of a mind diseased, that those controlled by their emotions lose for the time being their ability to reason correctly, become pseudofeeble-minded, objects of pity rather than blame; and as specially emphasized above, they can be trained to see that their own feelings have nothing to do with reality.

The function of the school as an institution par excellence for giving worth while tasks and the opportunity of the teacher, have been emphasized. Some of the ways in which the school develops unfortunate inhibitions and robs the child of his task have also been noted. The importance for the school of the principles of mental hygiene involving attention to the present situation, orderly association, work, the attitude of facing reality, self-control, and the like, have been illustrated.

Certain possibilities of development and certain limits are set by heredity. To extend these is the function of the eugenist, to make the most of them, the function of the educator and the mental hygienist. Mental hygiene shows that within the limits set for the individual by heredity, not only can mental disorders be prevented, but integration of the personality and positive habits of health can be developed.

To learn to face reality, to acquire habits of attention and orderly association, to develop wholesome interests, to control one's emotions, to coöperate in a normal social group; in a word, integration of the individual character and integration of the social group, are more valuable than the acquisition of all knowledge and the mastery of all conventional accomplishments. Thus the application of the principles of mental hygiene in all forms of education, whether in the home, the school, on the playground, or in industry, is essential for efficiency, happiness, and normal development.

Modern hygiene is positive, its aim is not the mere prevention of disease, but the development of habits of health. Neither mental health nor physical health can be taken for granted. The watchword of both is prevention; but the best means of prevention is usually healthful development—on the physical side, a high health level and habits of health, on the mental side, integration and healthful mental attitudes. The author would emphasize the need of physical health and freedom from infection no less than Dr. Cotton; but would, perhaps, emphasize mental training more. The twofold aim, prevention on the one hand, and the development of healthful function on the other, involve to-day a nucleus of scientific knowledge and hygienic practice suggested by the words stimulation, inhibition, association, integration, task, coöperation, development.

This country rightly has faith in its public schools; but the popular slogan, "The schools must save America," will never come true as long as the schools trust to mere instruction of the individual pupil in conventional knowledge. They will never really save themselves or anything else until they give training for the individual and for the social group according to the

essential doctrines of scientific education and mental hygiene, and this for the home as well as in the school, and from the kindergarten to the university.

Both civilization and democracy are likely to be, as the critics say, mere dreams always liable to become nightmares, unless healthful mental attitudes and integration in the individual and the social group are developed. Without this, peace itself has its conflicts and clashes of interest, which may be more pathological than those of war itself. On the other hand, with such training in education and hygiene, differences of ability and personal opinion and conflicts of interest and judgment become themselves helpful stimuli that make for growth and development in the individual and the group.

Everywhere to-day there is conflict of theory, doubt in regard to democracy itself, pessimism in regard to civilization, hopelessness in regard to the lack of intelligence in the majority of people, and hope only in the superior few. Everything in life and modern education makes for inhibition, hence the reaction and revolt among the young, the pessimism among the old, and in general unrest, intellectual and moral. On the other hand, from lack of social inhibitions developed by normal social training come apparently degeneration of manners and the unspeakable deeds of perverted adolescents that have recently shocked us. In such a condition of education and civilization, why not for one thing at least try to conserve in children what is so important for adults—attention to the present, the instinct of activity and workmanship, and spontaneity in thought and action —and while teaching the alphabets of learning, of morals, and of health, why not at least try to avoid the outstanding forms of injurious inhibition.

If Bateson should prove to be right, that the great difference between the genius and the common man is the fact that the genius is free from inhibitions by which ordinary men are handicapped, then the hope of the world lies more in mental hygiene than it does in conventional education itself.

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INDEX

Aall, A., 447.
Abbot, E. H., 658.
Abbot, E. S., 14, 23, 289, 310.
Accomplishment quotient, 253.
Ach, N., 286, 310.
Active attitude, 662.
Active mental response, 633.
Activity, impulse to, 652.
Adams, Charles F., 591.
Adams, John, 279, 597, 638, 686.
Adelung, J. C., 588, 597.
Adjustment, v, 27 *ff.*, 242, 245, 260, 665; and inertia, 666; of tasks, 231 *ff.*
Adler, A., 23, 206, 451 *ff.*, 484, 486, 541, 551.
Adolescence, 680 *ff.*
Adrian, E. D., 356.
Adults, epidemics among, 337 *ff.*; ignorance of, 434 *ff.*
Æmmer, F., 328, 347.
Affective reactions, conditioned, 111.
Age, anatomical, 247; chronological, 246; moral, 248; physiological, 247; psychological, 248; scholastic, 248; social, 248.
Aims of education, 1, 308, 508; at different periods, 2; confused, 464 *ff.*
Aims of mental hygiene, 18, 20, 464.
Amiel, H. F., 413, 496, 529.
Anatomical age, 247.
Anderson, L. O., 447.
Anderson, V. V., 571, 597.
Andress, J. M., 202, 447, 674.
Anger as an inhibition, 431 *ff.*
Anrep, G. V., 70 *ff.*, 165.
Antagonism of pupils and teachers, 461.
Archer, R. L., 348.
Armstrong, W. J., 686.
Arnett, L. D., 194.
Arnold, Sir Edwin, 663.
Arnold, S. L., 216, 545.
Arps, G. F., 310.
Arrest, emotional, 580; of development, 186.
Associated responses, 403 *ff.*
Association, vi, 56, 63, 409; complex, 174; interference of, 194, 409, 488 *ff.*, 508 *ff.*, 522 *ff.*; many, cause many errors, 508 *ff.*; orderly, 650, 681; orderly, as a condition of mental health, 488 *ff.*; pathological examples of, 492 *ff.*
Associations, free, 627.
Athletics, illustrations from, 492.
Attention, 34, 56, 502; in times of crisis, 643; in dangerous exercises, 643; to present situation, 642.
Attitude, active, 661; an active condition, 292; and school method, 306; child's, 223; contrast with idea, 291; examination, 374; important, 259; objective, 410; scientific, 668.

Attitudes, 13 *ff.*, 18, 344, 372, 374; and the school, 293 *f.*; childish, 582; developed by doing, 307; generic, 302; genesis of, 285; importance of, 284 *ff.*; mental, 283 *ff.*; modified by one's work, 295; of teachers, 302 *ff.*; on the playground, 299; pupils', 301; right, 141; significance for health, 288; significant for learning, 298; variety of, 287; wrong, 525.
Augustine, St., 618.
Automatization, 179; nature of, 180.
Autosuggestion, 314.
Aveling, F. A. P., 348.
Aversions, 363.
Ayres, L. P., 257.

Babinski reflex, conditioned, 600 *ff.*
Babinsky, A., 348.
Babinsky, J., 348.
Bacon, Roger, 585.
Bagley, W. C., 548, 565.
Bailey, Pearce, 23.
Bair, J. H., 489, 529.
Baird, J. W., 13, 210, 284, 310.
Balance, 356; need of, 665.
Baldwin, B. T., 279.
Bandler, S. W., 236, 279, 447.
Bardeen, C. W., 473.
Barker, L. F., 23, 406, 474, 486.
Barnes, E., 565.
Barrie, 540.
Bates, M., 310.
Bateson, W., 386, 447, 685.
Bath, the, 128.
Baudouin, C., 348.
Bechterew, W., 30, 88 *ff.*, 59, 101, 165, 538, 565.
Beck, R., 643 *ff.*, 674.
Beers, C. W., 23, 223.
Behavior, 356 *ff.*
Bergström, J. A., 488 *ff.*, 510, 515, 529.
Bernheim, H., 348.
Betz, W., 310, 536, 619 *ff.*, 639.
Biedl, A., 12, 23.
Binet, A., 249.
Binet-Simon, 100, 255.
Biology, evidence from, 45 *ff.*
Bizarre actions, 619.
Blake, Harrison G. O., 44 *ff.*
Blanchard, P., 537, 565, 598.
Blanton, S., 447.
Blunders in discipline, 552.
Bogen, H., 135, 165.
Bok, E., 275.
Bôkai, J., 324.
Bolton, F. E., 675.
Bönhof, H., 501, 526, 529.
Book, W. F., 177, 192, 196 *ff.*, 202, 285, 301, 310, 379, 447.
Boring, E. G., 249 *ff.*, 279, 310, 597.
Bostock, F. C., 47, 75, 83, 165.
Boswell, J., 494.
Bowditch, Dr., 553.
Bradford, G., 279.
Brain fatigue, 150.
Brav, A., 130.
Breed, F. S., 202.
Breese, B. B., 348, 386, 447.
Brewer, J. M., 258, 279.
Brickley, C., 300, 492, 503.
Brieux, 610.
Briggs (cartoonist), 457.
Brigham, C. C., 686.
Bronner, A. F., 24, 258, 279, 310.
Brown, H., 348, 621, 634, 639.
Bruce, H. A. B., 597.
Bruns, L., 348.
Bryan, W. A., 639.
Bryan, W. J., 658.
Bryan, W. L., 177 *ff.*, 202.
Bunyan, J., 425 *ff.*
Burbank, L., 217, 229, 686
Burckhardt, A., 330.

Burgerstein, L., 194.
Burnham, W. H., 24, 59, 129, 165, 280, 342, 348, 447, 486, 529, 565, 597, 674.
Burt, C., 254, 261, 280, 384 *ff.*, 447, 597.
Burtt, H. E., 280.
Buzzard, E. F., 624, 639.
Byron, Lord, 265, 413.

Cabot, R., 670, 674.
Caillard, E. M., 348.
Calkins, M. W., 52.
Campbell, C. M., 24, 117, 165.
Cannon, W. B., 24, 136, 139, 165, 403, 662, 674.
Carlyle, T., 128, 132, 364, 507, 556.
Cason, H., 92, 165.
Caution, often worry, 646.
Chamberlain, A. F., 674.
Chesterton, G. K., 261, 422.
Child, a new being daily, 649; and animal, 94; conditioned reflex in, 87 *ff.*, 104 *ff.*, 112, 117, 145 *ff.*; integration in, 40 *ff.*
Child's attitude, 223.
Childish attitudes, 582.
Children, conditioned reflex in training of, 145 *ff.*; defective, 95, 462 *ff.*; distractions of, 648; exceptional, 462; scientific attitude for, 669; study of, 40 *ff.*; training of, 647; unusual phenomena in, 154 *ff.*
Chronological age, 246.
Church group, 398.
Claparéde, E., 124, 392.
Clark, L. Pierce, 311, 533, 612 *ff.*, 639.
Classifications for quotients, 253.
Clear instructions important, 525.
Clothing, 128.
Clouston, T. S., 59, 647, 674.
Cole, L. W., 177, 194 *ff.*, 202.
Coleman, W. M., 654, 674.
Coleridge, S. T., 507.
Comenius, J. A., 7, 218, 365, 444, 543, 565.
Compensation, 453, 484, 537; over, 551.
Complexes, 36, 175; emotional, 582 *ff.*; prevention of unfortunate, 175; reputation, 48 *ff.*
Conditioned reflex, vi, 14, 62, 66 *ff.*, 87 *ff.*, 103 *ff.*, 144 *ff.*, 381; and habits, 170 *ff.*; and health, 318 *ff.*; and psychoanalysis, 618; genesis of, 174; hygienic suggestions, 114; importance of, 144 *ff.*; in animals, 74 *ff.*; in training of children, 145; influence of, 361 *ff.*; possible applications, 157; the bath, 128; wider relations, 153.
Conditioned reflexes, neuroses caused by, 604; of other glands, 135; permanent, 80; tricks as, 77 *ff.*; unconscious, 106 *ff.*; and the teacher's influence, 554.
Conditioned vomiting, 601.
Conduct disorders, 561.
Confidence, 664.
Conflict, 427; and insanity, 499 *ff.*; mental, 36, 541; social, 239; ways of reducing, 498 *ff.*
Conscientiousness, 496.
Consciousness, 401 *ff.*
Control, 662 *ff.*
Convention, 382; reason for, 651 *ff.*
Conventional training, 317.
Cook, H. C., 459 *ff.*, 486.
Cooper, C. R., 78 *ff.*, 165.
Coöperation, 241, 243.

Coöperative group, advantages of the, 547 *ff.*
Coördinated activity, 412, 419 *ff.*; thinking, 631.
Correlation, 513 *ff.*; principle of, 518.
Cotton, H. A., 674, 684, 686.
Coué, E., 637, 639.
Courtis, S. A., 257.
Crampton, C. W., 247.
Crile, G. W., 12, 24, 403, 413 *ff.*, 447.
Criminology, 16.
Culler, A. J., 489, 523, 529.
Curriculum, crowded, 365.
Curtis, H. S., 674.
Cutsforth, T. D., 169.
Cytovitch, S., 157, 166.

Dallenbach, K. M., 510.
Dalton plan, v, 206, 216 *ff.*, 267, 525.
Darwin, C., 265.
Dashiell, J. F., 202.
Davenport, C. B., 59.
Dawson, C., 424, 643, 645.
Defeat, heroes of, 475.
Defective children, 95; neglect of, 462 *ff.*
Defense mechanisms, 43; of the teacher, 480 *ff.*
Defense reactions, 537.
Delayed reactions, 98.
Democratic group, 270.
Democratic ideal, 273.
Dependence, normal sense of, 667.
Development, 248; fetish of symmetrical, 465 *ff.*; lower stages of, 590 *ff.*; stages of, 568.
Development quotient, 252.
Dewey, Evelyn, 216, 229.
Dewey, John, 166, 205, 267, 274, 278, 280, 486, 597, 648, 674.
Dexter, E. G., 565.
Didactic habit, 217.
Direct action, 424; cure by, 428.
Discipline, 343, 532 *ff.*, 550; and mental health, 532 *ff.*; blunders in, 552; hygienic method difficult, 558; in animals, 552; maxims, 561 *ff.*; methods, 555; preventive, 545; principles of, 558 *ff.*; rules for, 549; suggestion in, 340 *ff.*
Disease, 570; imitations of, 323 *ff.*
Disintegration, v, 42; forms of, 36 *ff.*
Dissociation, 39, 499.
Distractions of children, 648.
Dodge, R., 414.
Doing, 307.
Dolbear, Amos E., 465 *ff.*, 486.
Donaldson, H. H., 29, 58.
Dontchef-Dezeuze, M., 166, 202
Dreams, reporting one's, 627.
Dresslar, F. B., 674.
Drugs, 118, 413.
Dunlap, K., 447.
Dvorak, H. D., 265.
Dwight, T., 504.

Ear, hygiene of, 131.
Ebbinghaus, H., 514, 529.
Edgeworth, Mrs., 191.
Education, aims of, 27, 206, 308; and habit, 187; and suggestion, 312 *ff.*; hygienic aims, 148; unconventional, 580.
Edwards, A. S., 348.
Edwards, Jonathan, 618.
Efficiency, unhygienic, 504.
Eggleston, E., 191.
Ego, 48, 50.
Einstellung, 285, 291, 607.
Elephants, trained, 78 *ff.*

Eliot, C. W., 308, 468.
Ellis, H., 348.
Emerson, R. W., 219, 272 *ff.*
Emotional arrest, 580; complexes, 582; inhibitions, conditioned, 417; reactions, 393; reactions conditioned, 102.
Endocrine glands, 11 *ff.*, 30, 136, 395, 414.
Environment, rich, 216; suggestion by, 335.
Epidemics, 324 *ff.*; among adults, 337.
Epilepsy, the task in, 611 *ff.*
Erasmus, D., 444.
Erb, W. H., 653, 674.
Error, habits of, 182; interference and, 523; symbols as a source of, 153.
Examination, attitude, 374, 377 *ff.*; health, 7, 360, 459.
Examinations, 372 *ff.*, 377 *ff.*
Exceptional children, neglect of, 462.
Excitation and inhibition, 352.
Exhortation, excess of, 542.
Expression, relief by, 413.
Eyestrain, 130.

Failure, antitoxin of, 478; as a condition of mental health, 451 *ff.*; causes of, in the school, 454 *ff.*, 458 *ff.*; danger of, 480; extrascholastic conditions of, 469; inhibition of, 379; real preventive of, 481; social, 468 *ff.*
Fatigue, 37, 390, 501; as a protection, 392; brain, 149 *ff.*; of the retina, 391.
Fay, D. W., 24.
Fear, 69, 295 *ff.*, 363, 417 *ff.*, 436, 572 *ff.*; as an inhibition in the school, 435 *ff.*; devices for inhibiting, 418 *ff.*; fatigue as a protection from, 392; handicap of, 442; in the school, 432 *ff.*; inhibitions of, and their cure, 621; instruction in hygiene may cause, 433; mechanism of, 417 *ff.*; means of preventing, 420 *ff.*; movement to abolish, 443; of a mental act, 430 *ff.*; results of haste and, 238.
Feebleminded, 150, 302 *ff.*, 569 *ff.*
Feeling, normal reaction to, 655.
Fernald, W. E., 182, 453, 564.
Fernberger, S. W., 311.
Feuchtersleben, E., 674.
Finkenbinder, E. O., 519 *ff.*
Finzi, J., 33, 59.
Fisher, B., 166.
Fisher, G., 257.
Fisher, Irving, 20.
Fletcher, J. M., 436 *ff.*, 448.
Foch, F., 222.
Folkman, N. F., 166.
Folsom, J. K., 53, 59.
Food, 116.
Forel, A. H., 210, 230, 616, 675.
Frankfurt plan, the, 522.
Franz, S. I., 202, 686.
Free associations, 627.
Free speech, safety valve of, 658.
Freedom, 212 *ff.*, 236 *ff.*, 276.
Freeland, G. E., 230, 675.
Freud, S., 15 *ff.*, 24, 42, 53, 55 *ff.*, 59, 206, 402, 405, 409 *ff.*, 497, 501 *ff.*, 529, 621, 630, 639, 660, 675.
Freudians, vi *ff.*, 38, 179, 383, 407, 620, 627, 629 *ff.*, 632 *ff.*
Frings, J., 448.
Froebel, F., 205.
Froment, J., 348.
Froude, J. A., 426 *ff.*, 448.
Fryer, D., 258, 280.
Fullerton, G. S., 553.

Galton, F., 249.
Gamble, E. A. McC., 509, 530.
Gault, R. H., 348, 597.
Gazius, 5.
Gehring, J. G., 431 *ff.*, 448.
Geissler, L. R., 524.
Generic attitudes, 302.
Genetic point of view, 245, 473, 667.
Genung, G. F., 225.
Gesell, A., 230, 248, 251, 252, 256, 280, 359, 448, 675.
Gestalt, 680.
Gilles, 319.
Glands, 11 *ff.*, 30, 62 *ff.*, 395.
Glaser, O. C., 203.
Glueck, B., 16, 24.
Goddard, H. H., 686.
Goethe, 413, 616.
Golden rule, 225.
Gomperz, T., 530.
Gordon, R. G., 348.
Gorgas, Col. W. C., 222.
Gould, G. M., 130, 166.
Grant, Gen. U. S., 421.
Green, G. H., 448.
Greenwood, J. M., 368.
Gregory, A. E., 27.
Group, 269 *ff.*, 397; church, 398; coöperative, 547; leaders, 271; repressions, 658; school, 397.
Groves, E. R., 686.
Growth, 30.
Gurlitt, L., 348.
Guthrie, E. R., 110, 169, 487.
Gutzmann, H., 203.

Haberman, J. V., 24, 134, 166, 601, 639.
Habit, 170 *ff.*, 198 *ff.*; and education, 187; economy of, 181; plasticity, 185.
Habits, 171 *ff.*; acquisition of, 178; as conditioned reflexes, 170 *ff.*; conflict of, 193; formation of, 171 *ff.*; generic vs. specific, 190; group of, 176; hierarchy of, 177; hygienic, 114; interference of, 192; obsolete, 192; of error, 182; permanence of, 172; persistence, 196; unconscious, 175.
Hahn, 257.
Hall, G. Stanley, 8, 116, 166, 205, 226, 448, 686.
Hamel, I. A., 89, 166.
Hamilton, A. E., 280.
Hargreaves, H. L., 348.
Harper, W. R., 475.
Harriman, D. E., 477, 486.
Harris, C., 398, 448.
Harris, W. T., 205, 514, 530.
Hart, B., 499 *ff.*, 530.
Harter, N., 177, 202.
Hartmann, K. R. E. von, 401.
Hartwell, E. M., 448.
Haste, 238, 511 *ff.*
Hazlitt, W., 705.
Head, H., 355.
Health, 317 *ff.*; and suggestion, 317; dangers to, 5; examination, 6 *ff.*, 360 *ff.*, 459; highest condition of, 197; public, 19.
Healy, Wm., 16, 541, 549, 565.
Hegel, G. W. F., 205.
Heilbronner, K., 166, 602, 604 *ff.*, 639.
Heine, Fräulein, 512.
Helmholtz, H. L. F. von, 357.
Helps, A., 585.
Herbart, J. F., 205.
Heroes of defeat, 475.
Higher mental processes, 134.
Hillegas, H. B., 257.
Hirschlaff, L., 530.
History of hygiene, 4.
Hoepfner, 439 *ff.*
Holding the breath, 602.
Holmes, E. G. A., 236.
Holmes, O. W., 127, 377.
Holt, E. B., 210, 686.

Home, attitudes modified by, 297; mistakes at, 463 *ff.*
Homesickness, 107 *ff.*
Hoover, H., 206.
Hopkins, M. A., 535.
Horses, educated, 81.
Horton, C. E., 448.
Hough, T., 115, 146, 166.
Humor, sense of, 399 *ff.*
Humphrey, G. E., 105, 111, 117, 158, 230, 239 *ff.*, 280, 348, 639, 686.
Hunter, W. S., 98, 166, 203.
Huntington, E., 262.
Hurry, 365.
Huxley, T. H., 265, 651.
Hyde, W. DeW., 642.
Hygiene, 21 *ff.*; history of, 4; instruction in, 433; practice of, difficult, 672 *ff.*; teachings of, simple, 483 *ff.*; training in, 2.
Hygienic aims in education, 148 *ff.*
Hygienic habits, 114.
Hygienic method difficult, 558.
Hygienic suggestions, 114, 137.

Ibrahim, 602.
Idiot, 569.
Ignorance of adults, 434 *ff.*
Imbecile, 569.
Imitations of disease, 323.
Impatience as an inhibition, 431 *ff.*
Impulse to activity, 652; to complete an act, 478; to lie, 586.
Inability to face reality, 540.
Individual, neglect of the, 462.
Individual differences, 127.
Individualism, extreme, 243.
Inertia and adjustment, 666.
Inferiority, sense of, 400, 451 *ff.*, 474, 484, 537.
Inhibition, 69 *ff.*, 75, 123, 352 *ff.*, 388 *ff.*, 417 *ff.*; cure by removing, 439 *ff.*; devices that remove, 436 *ff.*; indirect causes, 384 *ff.*; inhibiting the, 389; internal, 72; methods for removing, 441; of failure, 379; of the will, 579; retroactive, 512; with a simple question, 374.
Inhibitions, 55, 234 *ff.*, 431 *ff.*, 606; emotional, 417; injurious, 139; of fear and their cure, 621; release from, 395.
Insanitary conditions, 363.
Insanity, 499.
Instruction in hygiene may cause fear, 433; not for the child, 342; overemphasis of, 460.
Integration, 29, 31 *ff.*, 42, 206, 243, 681; in children, 40 *ff.*
Intelligence, tests of, 249 *ff.*, 254.
Intelligence quotient, 252.
Interference of association, 409, 488 *ff.*; and error, 523; and worry, 526; in the untrained, 506 *ff.*; pathological, 492; with the automatic, 438 *ff.*

Jacks, L. P., 586 *ff.*, 597.
James, William, v, 173, 181, 189, 199, 203, 257, 261, 311, 387, 394 *ff.*, 448, 496, 581, 677 *ff.*, 686.
Janet, P. M. F., 348, 530, 642, 675.
Jarrett, M. C., 60.
Jastrow, J., 193 *ff.*, 203.
Jelliffe, S. E., 59.
Jennings, H. S., 675, 686.
Johnson, G. E., 269, 280.
Johnson, Samuel, 494.
Jones, C. T., 597.
Jones, E. E., 134, 167, 257.

Jones, G. E., 687.
Jowett, B., 448.
Jung, C. J., 206, 530.

Kalischer, O., 75, 167.
Kankeleit, A., 381.
Kant, I., 219, 651.
Kantor, J. R., 111, 167.
Kemp, T. H., 259.
Kempf, E. J., 24, 31, 60, 106 *ff.*, 140, 167, 618 *ff.*, 640.
Kerr, J., 349.
Kerschensteiner, G., 230, 267 *ff.*, 278, 280, 597.
Kilpatrick, W. H., 60, 205, 230, 307.
Kirkpatrick, E. A., 146, 167, 675.
Kline, L. W., 448.
Knee-jerk, conditioned, 89 *ff.*
Knowlson, 365.
Köhler, W., 679 *ff.*
Koffka, K., vii, 679 *ff.*, 686.
Kohs, S. C., 280.
Kosog, O., 349.
Kraepelin, E., 653.
Krasnogorski, N., 14, 71, 88 *ff.*, 92 *ff.*, 160, 167, 184 *ff.*, 251, 357.

Lackey, 257.
Laignel-Lavastine, M., 25.
Lamb, Charles, 364, 622, 640.
Lashley, K. S., 88, 167, 180, 202 *ff.*
Lay, W., 629.
Learned responses, 85.
Learning, 298; individual differences in, 195; kinds of, 146; of homonyms, 519.
Lee, J., 318.
Lessing, T., 132, 167.
Lewes, G. H., 506.
Lie, impulse to, 586.
Lipmann, O., 349.
Livingstone, D., 222.
Locke, John, 363, 409, 442, 448.
Lombroso, C., 498, 665 *ff.*
London, Jack, 475.
Lucas, K., 356.
Luckey, B., 578, 598.
Luckey, G. W. A., 487.
Ludovici, A. M., 273.
Lyans, C. K., 311.

McCall, W. A., 280.
McCollum, E. V., 17, 25.
MacCurdy, J. T., 640, 675.
MacDougall, R., 349, 530.
McDougall, W., 349.
McGee, W. J., 666.
McLaughlin, H. P., 203.
MacMillan, D., 222.
MacMunn, N., 236.
MacVannel, J. A., 187, 188, 203.
Maggiora, A., 506.
Mann, Horace, 536, 553.
Martin, E. D. 280.
Martin, L. J., 167.
Mateer, F., 14, 25, 88 *ff.*, 99 *ff.*, 167, 203, 598, 686.
Mather, F. J., 584, 598.
Maupin, O., 203.
Maxims, 560 *ff.*
Mead, C. D., 203.
Mechanism of defense, 333 *ff.*; of fear, 417 *ff.*; of reflex in the child, 105.
Memory reflexes, 93; in animals, 94; in child, 94; in defective children, 95.
Mental attitudes, 257, 283 *ff.*; and the school, 293 *ff.*; conditions, 233; genesis of, 285 *ff.*; suggestion and, 344.
Mental conflict, 541.
Mental defects, 534.
Mental health, 283, 405; discipline and the, 532 *ff.*; essentials for, 207; orderly as-

sociation as a condition of, 488 *ff.*; rules for, 671; success and failure as conditions of, 451 *ff.*
Mental hygiene, 3, 8, 563, 682; and education, 211; bases of, 28; essentials of, 207; function and aims of, 18 *ff.*; necessary for proper discipline, 550; principles of, 641 *ff.*
Mental measurements, 246 *ff.*, 254 *ff.*, 263 *ff.*; response, active, 633; second breath, 394; tests, 258 *f.*, 263 *ff.*; training, 683; work, 652.
Mercier, F. A., 168.
Methods, contrasted, 555 *ff.*
Methods, disciplinary, 555.
Meumann, E., 25, 86, 110, 168, 349, 369, 380, 448, 471 *ff.*, 487, 610, 640, 686.
Meyer, Adolf, 615 *ff.*, 640, 665, 675, 686.
Meyer, Max, 170, 203, 449.
Miehling, H., 349.
Miller, Joaquin (C. H.), 383, 449.
Misconduct, causes of, 533 *ff.*, 561.
Mistakes at home, 463 *ff.*
Misunderstandings, 51, 241.
Mitchell, S. W., 493, 530.
Moede, W., 311.
Monroe, W. S., 257, 280.
Montessori, M., v, 205, 230, 267.
Moral age, 248.
Morgan, J. J. B., 449.
Morgulis, S., 69, 72, 168 *ff.*
Moron, 569.
Mosso, A., 11, 69, 168, 506, 685.
Mott, F. W., 31, 60.
Mozart, J. C. W. A., 131.
Müller, G. E., 489, 510 *ff.*, 530.
Münsterberg, H., 199, 516, 530.
Mursell, J., vi, 55 *ff.*, 60, 640.
Myers, G. C., 349.
Myerson, A., 449.

Napoleon, 423, 470, 496, 609.
National Committee for Mental Hygiene, 36, 223.
National Kindergarten Union, 237.
Neglect of types, 461; of exceptional, 462; of defective, 462; of individual, 462.
Neumann, H., 243.
Neuroses, incipient, 333; caused by conditioned reflexes, 604.
Newman, Cardinal, 645.
Nietzsche, F. W., 261.
Normal, from genetic point of view, 667; mind, 27 *ff.*, 38; reaction to feeling, 655; sense of dependence, 667; social relations, 664.
Normality, 53 *ff.*

Objective attitude, 410.
O'Brien, F. P., 454 *ff.*, 487.
Obsession and conflict, 427.
Obsessions, 490.
O'Higgins, H., 449.
Orderly association, 488 *ff.*, 650.
Osler, W., 118, 642.
Overemphasis of instruction, 460; of the machine, 467 *ff.*; of the subject, 459.
Overinhibition, 360, 385.

Parents, 214.
Parker, S. C., 281, 306 *ff.*, 311.
Parker, S. W., 576.
Parkhurst, H., 230, 525 *ff.*, 531,
Parkyn, 505.
Pathological examples of association, 492.
Pathological reflexes, 600 *ff.*
Pathology of success, 476.

Paton, S., 46, 60, 168, 365, 449, 675.
Patri, A., 215 *ff.*, 218, 230, 269, 345, 417, 539.
Patrick, G. T. W., 281.
Paulsen, F., 344.
Pavlov, J. P., 14, 16, 61 *ff.*, 122 *ff.*, 139, 155, 160 *ff.*, 168, 320, 393, 449, 680.
Pavlov, Mme., 123.
Payne, 365.
Pear, T. H., 25.
Pearson, H. C., 519, 531.
Perrin, F. A. C., 203.
Perry, A. C., 565.
Personality, 226; study of, 52 *ff.*
Perspective, lack of, 505.
Pestalozzi, H., 205.
Pfister, O., 25, 53, 404.
Pflüger, E. F. W., 353.
Pfungst, O., 81.
Physical condition, 17, 245; conditions, 232; defect, 570; disorder, 533 *ff.*
Physiology, evidence from, 28 *ff.*
Pike, F. H., 181.
Pilzecker, A., 489, 510 *ff.*
Plasticity, 185; of nervous tissue, 150.
Plato, x, 240, 273, 385, 501.
Playground, attitudes on, 299 *ff.*
Porter, General, 421.
Porter, W. T., 25.
Pratt, G. K., 687.
Precocious development, 579.
Prejudices, 363.
Preschool life, 256.
Pressey, L. C., 281.
Pressey, S. L., 307, 311.
Preventive discipline, 545 *ff.*
Preventive training, 614.
Preyer, W., 457.
Prideaux, E., 349.
Principles of mental hygiene, 641 *ff.*
Prizes, 463.
Proal, L. J. C., 609 *ff.*
Project, and task, 208.
Project method, 210.
Pryor, J. W., 247.
Pseudofeeble - mindedness, 567 *ff.*, 683; other aspects of, 584 *ff.*; prognosis of, 593 *ff.*
Psychiatry, contributions of, 13, 38.
Psychic lesion, 660.
Psychoanalysis, 15, 617 *ff.*, 638; aim of, 620 *ff.*; and the conditioned reflex, 618; reasons why it works, 629 *ff.*: tasks involved in, 624 *ff.*; the place for, 635.
Psychoanalyst, 635 *ff.*
Psychological age, 247.
Psychology, contributions of, 13; evidence from, 33; of questioning, 369.
Public health, 19 *ff.*
Puffer, J. A., 549, 565.
Punishment and exhortation, excess of, 542; may mean opportunity, 554; merely first aid, 548 *ff.*
Pupil's attitude, 301.

Question, inhibition with a, 374.
Questioning, psychology of, 369 *ff.*; unpedagogical, 367 *ff.*; Yamada's study of, 370 *ff.*

Rage, 69.
Rasmussen, K. J. V., 643.
Rasmussen, V., 603, 640.
Raymond, E., 349.
Reaction, necessity for, 655; to feeling, 630, 655.
Reactions, 393; delayed, 98.
Reading, mental attitudes in, 306.

Réal, A., 565.
Reality, inability to face, 540; need of facing, 630, 668 *ff.*
Recognition method, 513.
Reflexes, conditioned, 61 *ff.*; favorable and injurious, 132; mechanism of, 105; memory, 93; pathological, 600 *ff.*; permanent, 80 *ff.*; true, 91; unconditioned, 66 *ff.*
Relief by expression, 412.
Repetition, 65 *ff.*
Repression as a cause of fear, 660.
Repressions, group, 658.
Reputation complex, 48 *ff.*
Resek, F., 601, 640.
Responses, associated, 403 *ff.*; conditioned, 88; learned, 85; pathological cases, 406; substitute, 403 *ff.*; victim of substitute, 407.
Responsibility, 218 *ff.*, 242.
Rest, alternation of work and, 653, 670.
Retina, fatigue of, 391.
Reymert, M. L., 565.
Rhythms, 654 *ff.*
Rice, J. M., 257.
Richards, A., 463 *ff.*
Richards, E. L., 433 *ff.*, 449, 565.
Richardson, R. F., 186, 203.
Richet, C., 157.
Riggs, A. F., 60, 431, 614, 640, 671 *ff.*, 675.
Rikimaru, J., 675.
Rivers, W. H. R., 349.
Roback, A. A., 386, 449, 489, 531.
Robinson, E. S., 379, 449.
Root, W. T., 281, 577, 598.
Rosanoff, A. J., 53, 60.
Rotch, T. M., 247.
Rousseau, J. J., 185, 190, 201.
Rowe, S. H., 203.
Rows, R. G., 622, 640.
Royce, J., 34, 193, 203, 426 *ff.*, 449, 649.
Ruediger, W. C., 533.
Rules for discipline, 549.
Russell, E. H., 7, 44, 339.
Ruttman, W. J., 531.

Sanctis, S. de, 492.
Sands, I. J., 565, 598.
Sanford, E. C., 81 *ff.*, 168.
Schaefer, E. A., 25.
Schaeffer, A. A., 203.
Schallenberger, M. E., 56.
Schleiermacher, F., 568, 648, 675.
Schoedel, J., 327, 349.
Scholastic age, 248.
Scholastic measurements, 257.
School, and mental attitudes, 293 *ff.*; causes of failure in, 458 *ff.*; fear in, 432 *ff.*; fear as inhibition in, 435; inhibitions developed in, 358; suggestion in, 316 *ff.*
School entrance, health examination at, 360; group, 397; method, 306; work, 296 *ff.*, 305, 454.
School hygiene, suggestion and, 320; for teacher, 342.
Schumann, F., 530.
Scientific attitude, 668; for children, 669.
Scientific thinking, 585.
Scott, C. A., 276, 281.
Scott, Sir Walter, 361.
Scott, W. D., 349, 367.
Scott, W. L., 566.
Sears, C. H., 566.
Seashore, C. E., 350.
Seelig, M., 30.
Seguin, E., 355, 568, 598.
Self, business, 47; child, 46; conception of, 34 *ff.*; conventional, 48; educated, 47; social, 47.

Self-analysis, 634.
Self-education, 315.
Selves, conflict of, 50 *ff.*; different, 46 *ff.*; relation of different, 50.
Senses, hygiene of the, 129.
Serenity, desire for, 650.
Shaw, B., 185, 214, 423.
Shepard, J. F., 449.
Sherrington, C. S., 29, 31 *ff.*, 60, 71, 169, 352 *ff.*, 449, 673.
Shields, T. E., case of, 589, 596, 598.
Shinn, M., 679.
Shock, 394, 606.
Sidis, B., 449, 607.
Simmel, G., 60, 276.
Singer, H. D., 334.
Sleep, 122 *ff.*, 161, 392.
Small, M. H., 322, 350.
Smith, F. C., 281.
Smith, G. E., 10, 25.
Smith, S., 110, 169, 487.
Social age, 248.
Social conflict, psychology of, 239.
Social education, 241, 268; failure, 468; misunderstandings, 51 *ff.*; principles, 244; relations, normal, 664; task, 231 *ff.*; training, 267 *ff.*
Sociology, evidence from, 40.
Socrates, 367, 618.
Southard, E. E., 60, 297.
Southey, R., 127.
Special abilities, 251 *ff.*, 255, 266.
Spencer, Herbert, 261, 265.
Stackhouse, 622 *ff.*
Stanley, H. M., 222.
Starch, D., 151, 257.
Stearns, A. W., 350, 609, 640.
Stecher, L. I., 279.
Stevens, A. H., 400.
Stevens, R., 301, 311.
Stevenson, J. A., 230.
Stiles, P. G., 390.
Stimulation, 71 *ff.*, 352; lack of, 577; over, 579.
Stimuli, 70; diffusion of, 68; effect of special, 333; widening circle of, 602 *ff.*
Stimulus, associated, 68, 680; of a new idea, 631; of success, 632; response to indifferent, 63; to thinking, 632.
Stockton, J. L., 366, 449.
Storing and discharge, 96.
Stratton, G. M., 109, 169.
Strayer, G. D., 454, 487, 533, 566.
Study, how to, 151; supervised, 152.
Stuttering, 320 *f.*, 435 *ff.*
Subject, overemphasis of, 459 *ff.*
Sublimation, 403 *ff.*, 663.
Substitute responses, 407, 663 *ff.*
Success, and worry, 474; as a condition of mental health, 451 *ff.*; as a stimulus, 479, 632; conditions of, 470; illustrations of, 471; pathology of, 476; psychology of, 456 *ff.*; stimulus of, 632; teacher and, 470.
Suck, H., 350.
Suggestion, and education, 312 *ff.*; and the conditioned reflex, 318; and school hygiene, 320 *ff.*; and the mental attitudes, 344 *ff.*; as teacher's function, 338 *ff.*; by environment, 335 *ff.*; in discipline, 340 *ff.*; in regard to health, 317.
Suicide, 321, 607 *ff.*; partial explanation, 610 *ff.*
Superior child, 265 *ff.*
Superiority, control by integrated, 272; in the group, 269.
Supernatural, halo of the, 632.
Surrogate, 407.
Sutherland, A., 657, 675.

Swift, E. J. 177, 204, 267.
Swift, W. B., 439 *ff.*, 450.
Symbols, 153.
Symmetrical development, fetish of, 465 *ff.*
Sympathy, 631.
Szegö, K., 324.

Tact, lack of, in teachers, 541.
Taine, H. A., 34, 60.
Tarkington, B., 119, 543, 590.
Task, ix *ff.*, 56, 215, 220 *ff.*, 461, 562, 650; adjustment of, 245; an autobiographical, 627; and project, 208 *ff*; and responsibility, 218; in epilepsy, 611 *ff.*; in pathological cases, 599 *ff.*; in psychoanalysis, 624 *ff.*; lack of concrete, 461; loss of, 225 *ff.*; made interesting, 628; need of a, 636; school, 205 *ff.*; significance of, 283; social, 231 *ff.*; wider significance of, 615 *ff.*
Teacher, 240, 338, 341 *ff.*; 470, 481; antagonism between pupil and, 461; as cause of inhibition, 379; as stimulus, 381; attitudes, 302; conditioned reflexes, 554; instruction for, 342 *ff.*; lack of tact in, 541.
Teachers of hygiene, 3.
Terman, L. M., 60, 251 *ff.*; 264, 266, 281, 454, 462, 566, 598, 675, 686.
Terrien, 323.
Tests, 249 *ff.*; 254 *ff.*; 263 *ff.*; in preschool life, 256;; inadequacy of, 260 *ff.*; of special abilities, 255; reliability of, 258.
Thayer, Judge W., 636.
Thiemich, M., 350.
Thierry, E. M., 350.
Thinking, coördinated, 631; scientific, 585; stimulus to, 632; twisted, 587; uncorrected, 584.
Thom, D. A., 204, 334.
Thomas, W. I., 311.
Thorndike, E. L., 257, 281, 312.
Titchener, E. B., 189, 311, 312 *ff.*; 350.
Todd, H. M., 294, 311.
Tolman, E. C., 450.
Tompkins, E., 439, 450.
Trabue, M. R., 255 *ff.*; 281, 598.
Training, 407; conventional, 317; in hygiene, 2; of children, 647; preventive, 614; social, 268 *ff.*; suggestions for, 407.
Treatment, pedagogical, 331.
Tricks as conditioned reflexes, 77.
Triplett, N., 41, 60, 566.
Trotter, W., 500, 531.
Trüper, J., 350.
Trumbull, M., 298 *ff.*; 311.
Twitmyer, E. B., 89 *ff.*, 107, 153, 169.
Types, neglect of, 461.

Unconditioned reflexes, 66 *ff.*
Unconscious, 402; conditioned reflexes, 106, 108; habits, 175 *ff.*; traces, 514.
Unconventional education, 580.
Uncorrected thinking, 584.
Unfamiliar, the, 376 *ff.*
Unlearning, 183.
Untrained, interference in the, 506 *ff.*

Varendonc, J., 350.
Ventilation, New York Commission, 17.
Verworn, M., 25, 311, 450, 531.
Vocational fitness, 258.

Vogt, 657.
Vorstellung, 285.

Wagner, R., 265.
Wallas, G., 660, 675.
Wallin, J. E. W., 687.
Walton, G. L., 421, 495, 531.
War, 20, 334; and its lesson, 9 *ff.*
Warren, 608.
Warren, H. C., 61, 169, 687.
Watson, J. B., 8, 25, 53, 55, 60, 75, 88, 101 *ff.*, 125, 136 *ff.*; 140, 162, 169 *ff.*; 194, 204, 312, 359 *ff.*; 381 *ff.*; 418 *ff.*; 445, 450, 687.
Watt, H. J., 510, 531.
Weber, E. H., 353.
Wells, F. L., 36, 39, 60.
Wells, H. G., 265.
Wheeler, R. H., 156, 169.
Whipple, G. M., 151, 264, 281, 687.
White, W. A., xi, 25, 59, 169, 452 *ff.*; 484, 640.
Whiting, 468.
Whitlock, Brand, 557, 566.
Wile, I. S., 482, 487.
Will, inhibition of the, 579.
Williams, F. E., 8, 25, 566, 676, 687.
Williams, T. W., 605 *ff.*, 640.
Wilson, G. R., 659, 676.
Wilson, H. L., 425, 450.
Wilson, Woodrow, 401.
Witmer, L., 281, 572 *ff.*, 598.
Wolf, F. A., 504.
Wood, E., 545.
Woodrow, H., 247, 687.
Woodworth, R. S., 404, 450, 687.
Woody, T., 257.
Work, 670; and rest, 653; attitudes modified by, 295; gospel of, 616.
Worry, 297, 474, 491, 494; and interference, 526; and success, 474; caution is often, 646.
Woskressensky, L., 449.

Yamada, S., 370 *ff.*, 450, 531
Yerkes, R. M., 100, 169.
Young, K., 60, 281 *ff.*, 687.

Zanotti, F. M., 61.
Zappert, J., 640.
Zollinger, E., 350.