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PRESENT-DAY CAREERS

PRESENT-DAY CAREERS

BY
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FOREWORD

THIS book attempts to present a broad picture of the professions which are open to students who have acquired a good general education, and to indicate the type of training which should be undertaken in each case.

Post-war conditions have affected practically every field of education and training, and in many cases developments which had already begun have been greatly accelerated, while it is not always possible to indicate the course that changes will take. Many professions have been and are the subject of Government inquiry, which leads to changes in training facilities, recognised qualifications and conditions of employment. The state is becoming increasingly concerned with all professional training and status. It co-operates with professional institutions in drawing up examination syllabuses, and issuing national certificates, establishes training councils and boards where these are needed, and establishes training centres at all grades. This concern is also expressed in the greatly increased provision of financial assistance for all types of education and training.

Industrial changes in Britain are also affecting the scope of professional employment, and there is a marked demand for more specific scientific and technical training in industry. Britain's economic future is more than ever dependent on her industrial efficiency, and awareness of this fact is being expressed throughout industry in the planning of courses which are designed to allow every man to develop and progress to the limit of his ability. At the same time, the importance of the human factor in industry is appreciated more clearly than ever before, and there appears to be an expanding future for such professions as personnel management and industrial welfare, while the social aspect of business administration is under investigation.

This growing recognition of the importance of human relations is bringing about a great increase in the social services,

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and much attention is being given to improving the training and status of social workers. Salaries for this group are by no means comparable with those of other professions, but are already on the increase.

National trends are causing a greater proportion of persons in all professions to become employed by the state, and this may ultimately produce a greater levelling of salary scales. No attempt is made here to indicate prospective salaries, partly because these vary so greatly and are under revision in many cases, and partly because it is assumed that economic inducement is not the important factor in the choice of a vocation. This is a matter of personal values, and there is scope for progress in every profession ; the worker will be more certain of success in a profession to which he is well adapted by temperament as well as by training.

The author wishes to acknowledge the assistance kindly given by the many organisations and institutions which have supplied information and which are mentioned in the text.

I. W.

CHAPTER I

ADMINISTRATION

BUSINESS ADMINISTRATION

A RECENT development in industrial life is the growing appreciation of the importance of scientific management. It requires a combination of technical knowledge and human understanding, and increasing attention is being given to the problem of professional training for business administration, particularly since the report of the Newson-Smith Committee on the subject in 1945.

There is no formal mode of entry to the profession, since recruitment is normally made from men of suitable qualifications and personality within a firm. It is being increasingly realised, however, that existing qualities of personality, technical knowledge and executive experience can be further enhanced by training in the principles and technique of industrial administration. Some firms encourage the recruitment of university graduates, in both arts and science, with a view to training for administrative posts. The modern approach has found expression in the endowment of a research fellowship in industrial administration at Cambridge University by a number of industrialists who wish to further the development of a scientific approach to problems of business administration and to utilise university-trained executives in industry.

Courses in industrial and business administration are conducted at a number of universities and technical institutions, and information should be obtained from the Registrar of a university or from the local education authority. The Urwick Report on education for management in industry and commerce (1947) has been approved by the Minister of Education who has invited local education authorities to

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establish courses on the lines recommended; the Report stressed the need for an increase in the supply of trained teachers in management. The Ministry of Labour and National Service has conducted a General Business Course and a Specialised Business Course for ex-service men; the last general business course started in September, 1947, and applicants who did not obtain a place in the Government Scheme may qualify for a financial grant towards the new permanent courses which are being established in technical and commercial colleges.

The Institute of Industrial Administration, Artillery House, Artillery Row, London, S.W.1 is an examining body which grants professional qualifications.

An Administrative Staff College has been established at Greenlands, Henley-on-Thames, where a three months' course has been designed for the study of the principles of administration in industry, commerce, trade unions and central and local government by men and women already employed in administration.

The Institute of Industrial Administration held its first summer school for management teachers in 1947.

PUBLIC ADMINISTRATION

Clerical and administrative officers are employed in local and central government departments in increasingly large numbers, and by various types of business firms.

The National Joint Council for Local Authorities' Administrative, Professional, Technical and Clerical Services has approved a scheme of conditions of service which provides that in future the junior entrant to local government service will normally go into the General Division, from which promotion will depend on reports on his work and passing the Promotion Examination, instituted in 1948 by the Council, or an equivalent examination. It is envisaged that candidates who pass the examination, which is equivalent to a Higher School Certificate standard, will form a pool of officials from which higher appointments can be made.

Officers wishing to take a more advanced course may read

ADMINISTRATION

for the Diploma in Public Administration granted by the universities of Bristol, Durham, Edinburgh, Glasgow, Leeds, Liverpool, London, Oxford, Sheffield and the University Colleges of Exeter and Southampton. The course normally lasts for two years. Manchester University provides a B.A. degree in Administration, which can be read by part-time students.

Entry to the Civil Service is by competitive examination, and information is published by the Civil Service Commissioners, Burlington Gardens, London, W.1.

A new scheme for recruitment and training of members of the Colonial Service was published in 1946 (Colonial No. 197), to provide the well equipped reinforcements needed by the Service.

CHAPTER II

AGRICULTURE

AGRICULTURE AND HORTICULTURE

AGRICULTURAL education was described in the Loveday Report (Cmd. 6728) as covering the training of all who contribute to agricultural activity, while the distinctive function of higher agricultural education was stated to be to train persons capable of advancing either the theory or practice of agriculture and of providing the industry with leadership. Agriculture includes, in addition to practical farming of all types, such spheres of work as the agricultural advisory services, estate management, inspection, teaching, research, economics, commerce and engineering. It includes the farm labourer as well as the independent farmer with large capital resources, and officers in the employment of government departments, the national milk testing and advisory scheme, local authorities, commercial firms and educational institutions.

The practical farmer may have acquired his knowledge through apprenticeship, or at a farm institute, while some take the university and agricultural college courses in agriculture or horticulture. For the advisory services and research, a degree is normally essential.

Nine universities and university colleges in England and Wales provide courses in general agriculture or special branches of the subject, leading to honours or pass degrees, extending over three or four years. In addition there are shorter courses leading to diplomas both for specialising graduates and for those not proceeding to a degree. In some cases certificate courses are also provided.

Residential agricultural colleges also offer courses in agriculture, generally extending over two years, for students of sixteen

and upwards. There are also shorter courses. These colleges have their own diploma examinations, and in addition prepare students for the national diplomas. Each has a farm, and some specialise in certain aspects of agriculture. In the case of both universities and agricultural colleges, autonomy and independence are important characteristics of their organisation.

Training of a more practical nature is needed to qualify for the four National Diplomas granted by agricultural societies: The National Diploma in Agriculture (N.D.A.) granted by the Royal Agricultural Society of England and the Highland and Agricultural Society of Scotland; the National Diploma in Dairying (N.D.D.) granted by the two above societies and the British Dairy Farmers' Association; the National Diploma in Horticulture (N.D.H.) granted by the Royal Horticultural Society; the National Diploma in Poultry Husbandry (N.D.P.) granted by the National Poultry Council.

Farm institutes are controlled by the county councils, but supported by grants from the Ministry of Agriculture and Fisheries. They vary greatly in size, and provide courses in general agriculture as well as in special branches, lasting an average of one year, together with shorter courses of varying duration. No defined standard of education is laid down, but practical experience of farming is required from pupils. In some cases there are two-year courses for the national diplomas. Close contact is maintained with practical agriculture; each institute is equipped with a farm, including a dairy herd and poultry, and undertakes demonstrations. The expenses of a considerable proportion of pupils are met by scholarships provided by the county councils and the Ministry of Agriculture and Fisheries.

The whole future of agricultural education is under review. The Luxmoore Committee reported in 1943, proposing that agricultural education should be administered as a co-ordinated system through a national council under the control of the Ministry of Agriculture and Fisheries. Other important recommendations are the provision of a farm institute in each county, reorganisation of courses of study at universities and

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agricultural colleges, and a unified advisory service based on six provinces in place of the existing thirteen. In 1944 two committees were appointed, both under the chairmanship of Dr. Thomas Loveday, to consider respectively agricultural education provided by local education authorities, and higher agricultural education.

The first of these issued in April 1945 a first report on the provision in secondary schools of courses preparatory to agricultural employment. The second issued a report in January 1946, advocating changes in the degree courses and limitation of degree courses to the universities, diploma courses to the colleges, and one year courses to the farm institutes. In consequence of these recommendations, the whole subject of agricultural education is under review, and it is possible that the honours courses in agriculture in universities may be replaced by ordinary degrees lasting for four years instead of three. The Alness Committee on agricultural education in Scotland, which issued a report in December 1945, also recommended that degree courses should be conducted exclusively at the universities, and diploma or shorter courses at the colleges (there are no farm institutes in Scotland); it also recommended the establishment of a single university centre of higher agricultural education in Scotland. It was announced in April 1946 that the Secretary of State for Scotland had decided to accept the recommendations that there should be a clear-cut distinction between the teaching of students aspiring to a degree, and of those taking courses leading after two years' study to diplomas or taking shorter courses; that instruction leading to degrees should be given in universities and shorter courses in agricultural colleges. The recommendation regarding the centralisation of university teaching in Scotland was not accepted.

The Loveday Committee on Higher Agricultural Education in England and Wales made detailed recommendations as to the training of the various personnel connected with agriculture. For practical farmers who enter a university, it advocates an improved ordinary degree in agriculture or horticulture; the dairy farmer and poultry farmer should supplement this course by appropriate practical experience.

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Persons entering estate management, and rural landowners, would profit by an agricultural degree course, followed by professional training. For park superintendents there is the student gardener system at the Royal Botanic Gardens, Kew and Edinburgh, the Royal Horticultural Society's gardens at Wisley, and the John Innes Horticultural Institution, Merton, but the Committee recommends a systematic course of training at an educational centre, leading to a diploma. For persons intending to enter the advisory service, the Committee recommends in general an honours degree in pure science, followed by a graduate course of twelve months in the appropriate agricultural science, with some training in the art of exposition, and probationary experience in the Service. Special training recommended for the bacteriologist includes the first part of an honours degree course in chemistry or a biological science or both, followed by two years of general bacteriology. The husbandry adviser should have an initial degree or the first part of a degree course in pure science, followed by two years in the study of agriculture and agricultural sciences. The poultry husbandry adviser should have an initial degree in agriculture or pure science, followed by a special course of training. The horticultural adviser should have an honours degree in pure science, preferably specialising in botany or chemistry or zoology, followed by two years spent in training in horticultural practice and science, and in gaining practical experience; further specialisation would be possible at advisory centres or research stations during the period of probation. Training similar to that for advisers is proposed for Ministry of Agriculture inspectors. For the agricultural economist the Committee recommends an honours degree in economics followed by a graduate course in agriculture or agricultural economics. The farm management expert should have a good grounding in agriculture or horticulture (a degree course) followed by training in economics; alternatively he may start as a general adviser in husbandry and develop a special knowledge of management through practical experience, private study and investigation. The marketing officer, who will be required in increasing numbers, may be a graduate in commerce with post-graduate training in

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agriculture if he is to specialise in market organisation, or a graduate in agriculture or horticulture with post-graduate training in commerce if he is to specialise in quality control. The agricultural engineer should be primarily an engineer, with emphasis on mechanical engineering, and having post-graduate agricultural training; the farm mechanisation expert, however, will require a degree in agriculture, or horticulture in a few cases, followed by a course in engineering; the Committee advocates greater use of the National Institute of Agricultural Engineering for training and experience.

It is anticipated that, if the recommendations of the Committee on Farm Buildings are implemented, there will be scope for architects, civil engineers, physicists and agriculturalists who have made a special study of farm buildings to enter the Advisory Service. It is thought that the National Agricultural Advisory Service should also include officers trained as agriculturalists, who are interested in geology and soils, have made a special study of farm drainage and water supply and have some knowledge of hydraulic engineering. It is stated also that the Colonial Service needs general agricultural officers, experts in horticulture and specialised branches of husbandry, scientific specialists, and agricultural officers for special duties such as marketing, education and inspection; these should have the same basic training as those preparing for work in Britain, supplemented by courses at the Imperial College of Tropical Agriculture. Research institutes should conduct advanced courses. For teachers in farm institutes and agricultural colleges, some professional training is recommended, as well as greater association with the work of the National Advisory Service.

The Loveday Committee on Agricultural Education to be provided by local education authorities issued an interim report on agricultural and horticultural institutes in January 1947. This report indicates the numbers and types of pupils for whom training should be provided at farm institutes; the forms such training should take; and the choice of suitable sites for the institutes. It is recommended that all institutes should offer three-term courses, and that there should be separate institutes for agriculture and horticulture.

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A system of assessed internal examinations leading to the award of certificates of proficiency is also proposed.

Agricultural Departments have been progressing rapidly in the tropical and sub-tropical Dependencies, and this has resulted in the creation of a considerable demand for trained workers in the Colonial Agricultural Service. Appointments are made by the Secretary of State, and officers may be posted and transferred at his discretion at any time after selection. With few exceptions, candidates for these appointments should have a university or agricultural college training. Specialist and research appointments are available for botanists, plant pathologists and agricultural chemists, with occasional openings for systematic botanists and physiological botanists. Agricultural Officers have agricultural duties of a more general character, and similar appointments for horticultural officers are sometimes available. There are also appointments outside the Colonial Agricultural Service for produce and crop inspectors, mostly in West Africa, and for horticulturalists.

Colonial agricultural scholarships for post-graduate training are offered annually, and Commonwealth Fund Fellowships are available for intending candidates for employment in the Colonial Service. The Imperial College of Tropical Agriculture provides instruction and conducts research in tropical agriculture, designed to support the investigational work of Colonial agricultural departments; it is the recognised centre in the tropics for the post-graduate training of officers selected for the Colonial Agricultural Service. Instruction is also provided for students from the Caribbean area in tropical agriculture and in sugar technology. Inquiries should be addressed to the Registrar, Imperial College of Tropical Agriculture, Trinidad, British West Indies, or to the Secretary at Grand Buildings, Trafalgar Square, London, W.C.2. Information regarding appointments to the Colonial Service may be obtained from the Director of Recruitment, (Colonial Service), Colonial Office, 15 Victoria Street, London, S.W.1.

The post-war heavy demand for agricultural training has led to the adoption of a rule that up to 90 per cent. of the

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available places at university departments of agriculture and agricultural colleges shall be reserved for ex-service men and women and men who have completed a period of at least three years' employment in agriculture since reaching the age of eighteen; this follows the arrangements in force for universities and comparable institutions generally. At farm institutes up to 75 per cent. of the places available are being reserved for the same priority classes. Many boys awaiting entry to these institutions are taking the opportunity to gain practical experience by making use of training facilities on individual farms. The Agricultural Wages (Regulation) Act, 1947, contains a provision that, if the Central Wages Boards fix special rates for learners, such rates shall apply only when the terms of the learner's employment have been approved by the local committees. No premium may now lawfully be received in respect of a worker under a contract of service or apprenticeship in agriculture, except where the arrangement is approved by the Committee.

The Y.M.C.A., in co-operation with the Ministry of Agriculture and Fisheries, offers preparation and training for an agricultural career to boys between the ages of 14 and 17. This "British Boys for British Farms" scheme provides hostel accommodation for selected boys during the training period, which lasts from 8 to 10 weeks. The four hostel centres are: Ham Green, near Bristol; The Mammerton Farm, near Derby; Clifford Chambers, near Stratford-on-Avon; and Burscough, Lancashire. After satisfactory completion of training, the boys are placed in employment on selected farms, and receive the regular rate of wages. During the first eighteen months of employment they are visited by Y.M.C.A. after-care workers. Information may be obtained from the Field Secretary, Y.M.C.A., "British Boys for British Farms," 4 Great Russell Street, London, W.C.1.

The Henry Ford Institute of Agricultural Engineering offers a one year course to boys between the ages of 16½ and 17½ of school certificate standard. The course covers theory and practice of farming, with special emphasis on mechanisation and the best use and upkeep of tractors and farm machines. Free agricultural scholarships are being offered to

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boys, covering the cost of tuition, residence and laundry. Applicants are required to have reached school certificate standard, and to have had some practical agricultural experience.

The Milk Marketing Board provides employment in connection with milk recording and artificial insemination, and also recruits girls to the creamery laboratories. Milk recording is concerned with the administration of the National Milk Records Scheme, and the work involves visiting farms, assisting in the preparation of records, and collecting samples of the milk for butterfat testing. The Board provides a period of training on full pay to suitable candidates, with subsequent courses of instruction and examinations. The initial training for an inseminator lasts for four weeks, normally at one of the Board's centres, and a salary is paid during training. Girl laboratory assistants are recruited either as unqualified assistants at the age of 15 or 16, or with qualifications such as the National Diploma from one of the agricultural colleges; general training is provided, and there is scope for promotion to appointments in charge of laboratories.

Agricultural merchants have the function of acting as general advisers to their customers, and have close contacts with farmers. In order to organise educational work for the benefit of the trade of corn and agricultural merchants, the National Association of Corn and Agricultural Merchants founded in 1945 the Institute of Corn and Agricultural Merchants Ltd. (Cereal House, Mark Lane, London, E.C.3). Its aim is to train the younger members entering the trade in the fundamental scientific principles of agriculture in all its branches, and to keep the merchants apprised of scientific progress and new developments. A correspondence course, specially prepared for the merchants, was instituted in 1945. The Institute has also arranged several special courses of four and six months' duration, in conjunction with the agricultural colleges, comparable in standard with a condensed version of the normal college certificate course. The majority of the students at present taking the courses are ex-service men, most of whom are returning to the trade after their service in

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the Armed Forces. In addition, special summer refresher courses of one, two and three weeks are held at agricultural colleges, for the benefit of senior members of the trade who are unable to spare the time for a longer type of course. Individual lectures are given from time to time. The Institute offers various grades of membership, viz. patrons, fellows, graduate members, members, associates and student members.

The Women's Land Army was recruited during the war to supplement existing agricultural labour, and the acute shortage of agricultural labour in the immediate post-war years has led to its retention. A recruiting campaign conducted in 1946 aimed at raising 30,000 new members. Types of employment include all forms of farm work, such as milking and dairy work, care of livestock, fieldwork, tractor driving, threshing and pest destruction; fruit and vegetable cultivation; and timber production, including timber-felling operations and the measurement of sawn timber. Accommodation is provided on farms, in private billets or in hostels. No previous experience of land work is required, but recruits must be prepared to work in any part of the country. They must be between the ages of 17 and 40, and are expected to sign for two years' service. One month's preliminary training is given, either on an approved farm or garden or at a farm institute or college. Correspondence courses in agriculture and horticulture, organised for the Ministry of Agriculture by the College of Estate Management and the Royal Horticultural Society, are held during the winter months, and proficiency tests are held in the principal types of work. The Women's Land Army Benevolent Fund has as one of its objects to help members who wish to stay on the land and train at a farm institute or agricultural college. Members are eligible for grants for vocational training under the Government's scheme for agricultural and horticultural training for men and women released from war service; applications should be made to the County Branch office of the W.L.A.

The Women's Farm and Garden Association represents the interests of women professionally engaged in agriculture and horticulture. It conducts an advisory service in relation to education and training, an employment bureau, and

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operates a Garden Apprenticeship Scheme for girls unable to take a full college course, arranging for their apprenticeship to head gardeners of large private gardens. Information may be obtained from the Secretary at Courtauld House, Byng Place, London, W.C.1.

FORESTRY

Forestry is closely allied to agriculture, and includes manual work, management and research. The forest worker carries out the actual practical work, the ganger is the leading workman of a gang of workers, the foreman may be in charge of a small area of woods or may act under a forester, the forester is in charge of a large woodland area, and the forest officer is responsible for woods and forests over a large district. Specialist posts are available in research and education, private forestry, and in firms of land agents. Training for foremen and foresters is given in residential training schools, organised by the Forestry Commission. At the end of one year a foreman's certificate is issued, and a forester's certificate at the end of the second year. A year's preliminary practical experience as a forest worker is normally needed, and applications should be made to a forest officer or to the Secretary, Forestry Commission, 25 Savile Row, London, W.1. A boy leaving school may become a juvenile forest worker, before entering the training school at the age of 19. Forest officers require a university degree in Forestry, which may be taken at Aberdeen, Bangor, Edinburgh or Oxford. The first of a series of three-month courses in Forestry was opened in February 1946; these, held on approved private estates, are designed for instructing forest workers, gangers and foremen in the theory and practice of forestry; certificates are awarded by the Forestry Commission, and at the end examinations are held also for the Royal Scottish Forestry Society's Woodman's Certificate.

There are a few appointments in the Colonial Forest Service for specialist officers (*e.g.* for silvicultural research, the preparation of forest working plans and the utilisation of forest products), but normally appointments are made to the

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grade of Assistant Conservator. Appointments are made by the Secretary of State. The work consists chiefly in the demarcation, survey, protection and management of large tracts of natural forest, the exploitation of timber and other forest products, and the formation and tending of plantations. Candidates for appointment as Forest Officers are required to hold a degree in forestry of a British University, but some of the vacancies for Assistant Conservators are filled by graduates in other subjects who have held the Colonial Forestry Scholarships. Successful candidates are selected for probationary appointment as junior Forest Officers for a preliminary tour of service of not more than 22 months, followed by a final course of training at the Imperial Forestry Institute at Oxford.

Vacancies occurring in Forestry Departments are filled on the recommendation of the Crown Agents for the Colonies, 4 Millbank, London, S.W.1. ; for these posts candidates are required to hold the diploma of the Forest of Dean or Benmore School.

The Forestry Commission also runs short training courses lasting three months for men from private estates with three years' experience or ex-servicemen with two years' experience prior to joining up. Successful completion of the course will provide a qualification to take over supervision of a small estate or be second-in-charge of a larger estate.

VETERINARY SCIENCE

The veterinary service is closely allied to agricultural developments. Veterinary surgeons generally work in private practice, but there are some posts under the Ministry of Agriculture and Fisheries, Colonial governments, local authorities and in research and teaching. The diploma of membership of the Royal College of Veterinary Surgeons is the recognised qualification to practise, but some universities offer in addition a concurrent degree course in veterinary science. Further qualifications may be obtained, such as fellowship of the Royal College of Veterinary Surgeons, the College's Diploma in Veterinary State Medicine and Diploma in Tropical Veterinary Medicine and Hygiene, and research

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degrees at the universities. Research scholarships are awarded by the Royal College and by the Ministry of Agriculture and Department of Agriculture for Scotland in conjunction with the Agricultural Research Council.

The Loveday Committee on veterinary education issued a second report in April 1944, and the Chancellor Committee on veterinary practice by unregistered persons reported in March 1945. In April 1946 it was announced that the Government has decided to accept broadly the recommendations of these two committees ; there is to be legislation empowering the Privy Council, after consultation with Ministers and the Council of the Royal College of Veterinary Surgeons, to authorise a university to confer the full veterinary degree which will entitle holders to registration with the Royal College of Veterinary Surgeons. The Government will provide more money to improve the facilities for veterinary education. The Council of the Royal College will be reconstituted, and provision will be made for it to exercise powers of inspection of teaching facilities and examinations at all veterinary teaching centres. The subject of veterinary practice will be dealt with on the lines proposed by the Chancellor Committee.

The majority of vacancies in the Colonial Veterinary Service are filled by selection of Colonial Veterinary Scholars or Students on completion of their training ; the former are graduates in general science, while the latter hold a veterinary qualification and aim at further scientific study. The nature of the work in the Colonial Service is more concerned with prevention or control of disease among animals *en masse*, the administration of regulations, research on animal diseases and livestock improvement and management.

GOVERNMENT TRAINING SCHEMES

The Government has announced schemes for practical training on the land of men and women released from war service. The scheme of agricultural and horticultural training in England and Wales for non-disabled men and women released from war service is designed to provide an avenue

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for entry into the agricultural industry of those without experience on the land ; to improve the prospects within the industry of those with agricultural experience ; and to train the additional skilled labour that an efficient and highly productive agriculture needs. The scheme is administered by the Ministry through the County War Agricultural Executive Committees in co-operation with the Ministry of Labour and National Service. For persons without agricultural experience training will take the form of a year on a farm or other holding approved by the County War Agricultural Executive Committee. For persons with experience who want supervisory or specialist jobs, and those who complete the year's training on a farm with outstanding success, training will take the form of courses of the farm institute type. A target of 100,000 trainees has been set. Trainees are accommodated either on the farms or in lodgings or hostels near the farms, and where practicable arrangements are made for wives to join their husbands. Maintenance and travelling allowances are paid. The Ministry of Agriculture undertakes to take all practicable steps to ensure that satisfactory trainees are found suitable employment on the land on completion of training. Application should be made to the local offices of the Ministry of Labour and National Service, and the final decision as to an applicant's suitability for training will rest with the Ministry of Agriculture and Fisheries acting through the War Agricultural Executive Committee. Members of the Women's Land Army should apply to their County Branch offices. Training for rural industries will be provided under separate schemes.

The agricultural and horticultural training scheme for disabled persons in England and Wales was announced in April 1945 ; arrangements are made for providing training for disabled persons under the provisions of the Disabled Persons (Employment) Act 1944 ; so far as may be necessary, preference for training will be given to men and women discharged or released from war service. The scheme is operated by the Ministry of Agriculture and Fisheries through the County War Agricultural Executive Committees in co-operation with the Ministry of Labour and National

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Service. Applications should be made to local offices of the Ministry of Labour. Applicants who seem unlikely to be capable of earning ultimately the full minimum agricultural wage will not be accepted for training, but exceptions may be made for persons whose disability compels them to undertake open-air work. Successful applicants without experience will be placed on selected farms, market gardens or similar establishments for practical training lasting up to twelve months. Standard allowances will be made during training. Applicants with agricultural or horticultural experience who wish to qualify as foremen, bailiffs, farm managers, etc., may be given one-year courses of the farm institute type at training centres which are being established in a number of counties.

Under the vocational training scheme, advanced horticultural courses are being given at Kew, Wisley and Merton for persons who, by reason of war service, have been unable to complete their training as gardeners or who have suffered interruption in their occupation and need training. Persons entering Wisley and Merton require to have three years' practical gardening experience or training, and four years' for the course at Kew. The courses last for one year, and one hundred places are to be available annually. Applications should be made to the local offices of the Ministry of Labour and National Service. Meanwhile there are no vacancies at Kew for ordinary student gardeners, but when normal training is recommenced student-gardenerships will be open equally to men and women, and applicants will be expected to have passed the Senior General Examination of the Royal Horticultural Society.

Arrangements have also been made under the vocational training scheme for forestry training for men released from war service and suitable disabled men. It is stated that Forestry in the United Kingdom is ready to absorb 5,000 skilled men immediately, and more will be needed if the proposals of the Forestry Commission are to be fully implemented. Inexperienced persons will be given one year of practical training on a forestry estate, and applications should be made to local offices of the Ministry of Labour and National Service. Men showing outstanding ability will be eligible for further

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training to qualify for supervisory employment. Allowances will be paid during training. The scheme is administered by the Forestry Commission in co-operation with the Ministry of Labour and National Service. Jobs as forest workers are guaranteed at the end of the period of training, in private or state forests, at wages not less than those of agricultural workers. A limited number of smallholdings of up to ten acres is available.

Under the Government's Further Education and Training Scheme, assistance is given to those of secondary education standard whose further training was interrupted or prevented by war service. Thus suitable persons may train for posts on the advisory, teaching and technical branches of agriculture, horticulture, forestry and veterinary science.

Similar schemes are in operation in Scotland. The schemes apply to members of the Women's Land Army, who are recommended to take courses in dairying, poultry and gardening.

The Agricultural Resettlement Grants Scheme, administered by the Ministry of Labour and National Service, is intended to assist men and women who were working agricultural or horticultural holdings on their own account for commercial food production before entering war service, and who need help in order to restart a holding, and to assist those disabled by war service to set up in a holding on their own account for the first time. The scheme will give a reasonable amount of assistance to enable applicants to meet their initial expenses in equipping and stocking a holding, including the purchase of such requirements as tools, implements, stock or glass, the maximum grant being £150. The scheme applies to smallholdings and rural crafts only, and not to settlements outside Great Britain or Northern Ireland. Application should be made to the office of a County War Agricultural Executive Committee in England or Wales, to the Department of Agriculture in Scotland, and to the Ministry of Agriculture in Northern Ireland.

ADVISORY SERVICE

The National Agricultural Advisory Service, which was established under the Agriculture (Miscellaneous Provisions)

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Act, 1944, came into operation on 1st October, 1946, and is designed to ensure that farmers will have ready access to technical advice in every aspect of farming. Experimental and demonstration farms are being established under this service, and there will be an increasing number of openings for officers with specialist qualifications in all branches of research and teaching in connection with agriculture. These officers are wholly employed by the Ministry of Agriculture and Fisheries.

Local authorities also provide day and evening classes, and give practical instruction in special operations such as ploughing. Correspondence courses, lectures and demonstrations, discussion groups and clubs and associations also make important contributions to farming practice. Special mention may be made of the important educational work conducted by the National Federation of Young Farmers' Clubs.

CHAPTER III

AIR TRANSPORT

CIVIL AVIATION

PERSONNEL employed in operating civil air transport include flying staff, higher technical staff, aircraft engineers and maintenance staff, and commercial and administrative staff. Employment may be with companies operating air services on internal and overseas routes, with firms engaged in charter and air taxi services, and in other commercial flying activities.

Civil aircraft pilots' licences are granted by the Minister of Civil Aviation, and the requirements are set out in the Air Navigation Direction 1936 (A.N.D. 13) and subsequent amendments. New regulations for the grant of civil aircraft pilots' licences were announced in February 1946. The old "A" and "B" licences are replaced by Provisional Licences for pupils, the Private Pilot's Licence ("A"), the Commercial Pilot's Licence ("B"), and the Air Line Pilot's Licence ("C"). Regulations governing details of requirements for the grant of Civil Aircraft Navigators' Licences are contained in Air Ministry Pamphlet 44. These are granted in first, second and cadet classes.

An Instructor's Certificate is issued by the Guild of Air Pilots, after a flying test, when the Government Licence may be endorsed. The Guild also provides or arranges for educational facilities for members of air crews and maintains an employment bureau. The Guild offers assistance to R.A.F. pilots who wish to make civil aviation their career. Its educational fund was established in 1944 for the education and training of persons who are, have been, or intend to become professionally engaged as air pilots or air navigators in commercial aviation. Particulars may be obtained from

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the Secretary, Guild of Air Pilots and Air Navigators of the British Empire, 4 Hamilton Place, London, W.1.

A Radio Operator's Certificate is granted by the Air Ministry. Information relating to wireless telegraphy may be obtained from the Postmaster-General's Handbook for Wireless Telegraph Operators.

The Royal Aero Club issues a Certificate of Performance to those qualified under agreement with the Fédération Aéronautique Internationale, the international authority governing all private and sporting flying.

Instruction in flying is provided at most of the British flying clubs. The British Overseas Airways Corporation conducts its own training courses for all categories of employees. Instruction is arranged by the Guild of Air Pilots and Air Navigators of the British Empire, which also publishes a booklet *Your Future in Civil Aviation* (price 1s.), a guide to the prospects of employment in civil aviation for those at present serving in the Royal Air Force and the Fleet Air Arm. There are also many commercial training schools providing tuition for civilian airline crews.

The Institute of Transport holds examinations for those who wish to engage in the commercial side of civil aviation, covering such topics as law of transport, economic geography and history, and economics of air transport.

Licensed Aircraft Engineers are employed by flying clubs, aero manufacturing firms, engine manufacturing firms and by airlines, in overhaul or maintenance work. Work in connection with certification of airworthiness is divided between the overhaul and maintenance engineers. The larger aircraft often carry flight engineers. These aircraft engineers must hold licences which are granted by the Ministry of Civil Aviation on the recommendation of the Air Registration Board, and particulars may be obtained from the Secretary, Air Registration Board, Brettenham House, Lancaster Place, London, W.C.2. The following licences are issued: "A"—Certification of safety for flight (airframes only) and of permitted minor repairs, modifications and replacements to airframes; "B"—Certification of airframes after overhaul and of major repairs or modifications; "C"—Certification

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of aircraft engines before flight, and of minor repairs, modifications and replacements ; " D "—Certification of aircraft engines after overhaul and of major repairs or modifications ; " X "—Certification of the overhaul, repair or modification of the various items of equipment (compasses, magnetos, variable-pitch airscrews, instruments and electrical equipment).

The draft Air Navigation (Radio) Regulations require all matters relating to the maintenance of radio apparatus installed in aircraft registered in the United Kingdom to be certified by an aircraft radio engineer, licensed by the Minister of Civil Aviation.

Qualifications for engineers' licences require five years' approved aeronautical experience, with a minimum of two years' practical experience in maintenance for categories " A " and " C ", and in manufacture or overhaul and repair for categories " B " and " D. " For restricted licences the requirements are three years and one year respectively.

The Air Transport Auxiliary Engineers' Training School, White Waltham Airfield, near Maidenhead, is in future to be concerned solely with the training of B.O.A.C. ground engineering personnel in " A, " " C, " " D, " and " X " categories.

ROYAL AIR FORCE

Full details regarding entry to the Royal Air Force should be obtained from the Under-Secretary of State for Air. The Royal Air Force College, Cranwell, which was closed at the beginning of the war, reopened in October 1946 with about sixty vacancies for cadets. Candidates must reach School Certificate standard ; the dates when application should be made to the Civil Service Commission are announced in the Press, and a prospectus may be obtained from the Air Ministry. The Royal Air Force provides openings for all grades of flying personnel, engineers and photographers. It was announced in March 1946 that the Reserve Command of the R.A.F. would be re-established in the immediate future. The twenty auxiliary squadrons which existed before the war would be recreated on their old territorial basis, and for the present the

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Air Training Corps would be maintained at a strength of 75,000. Discussions had been opened with the university authorities to determine at which universities it would be possible to maintain university air squadrons. The utmost importance was attached to these non-regular forces, which it might be desirable and possible to develop to a much greater extent in the future than before the war. It was stated in November 1945 that the Air Training Corps should be the main source of recruits both for air crews and ground services in the regular and non-regular forces (including the Fleet Air Arm), and that officers would continue to be selected from Cranwell, the university air squadrons and from rankers.

R.A.F. Transport Training educates air crews in medium-range transport work, including transport support, and in long-range transport work, including the support of airborne forces. To ensure that large bodies of troops and/or heavy loads of military equipment may be carried with the maximum degree of safety and regularity, the standard of efficiency is high and training includes flying in almost any weather conditions, by day or night, anywhere in the world.

The R.A.F. Transport Training organisation at present consists of four main training units. The Transport Initial Conversion Unit gives all prospective transport flying personnel a ground course. This is devoted to all subjects of special importance in transport flying, and a flying-course is included, emphasising the use of radio-aids in airfield and runway approach on instruments. From the T.I.C.U., according to their previous experience and qualifications, crews go to either a Transport Conversion Unit or to a Heavy Transport Conversion Unit. The T.C.U. carries out conversion on to medium-range transports, using twin-engine aircraft. The H.T.C.U. carries out conversion on to long-range transports, using four-engine aircraft. After passing through the Conversion Unit, personnel take a further course at a Transport Support Training Unit. A proportion of crews from the Heavy Transport Conversion Unit also do this course at a Transport Support Training Unit, and as soon as facilities permit it is intended that all transport crews will undergo the latter course before reaching squadrons. Transport Support

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Training Unit trains in the towing of gliders, dropping of supplies and parachutists, and in air support of airborne forces operating on the ground.

TESTING AIRCRAFT

The Empire Test Pilots' School, established in 1943, is run by the Ministry of Supply, and is designed to train the R.A.F., Royal Naval, civilian, Allied and Dominion Government test pilots. All pilots have to be sponsored by their relevant Government, service or firm. The course is divided into three main periods. Seven months are spent in the School, four to five weeks at the Royal Aircraft Establishment, and four to five weeks visiting firms in the aircraft industry.

The active career of a test pilot is seldom more than ten years, after which he moves to the directing side of a firm, as adviser on the design staff or on the sales side. At present there are only about five vacancies a year in the British Aircraft industry for test pilots. The Royal Air Force and Royal Navy normally permit pilots a tour of three years at a time on test work, and so provide a greater intake of test pilots.

A test pilot requires to be A1 medical category, not over 25 years of age at entry, and to have completed 1,000 hours of flying. The R.A.F. requires four years of service, or preferably a permanent commission. The applicant must be above average as a pilot, have attained matriculation standard in mathematics, and be interested in all technical and engineering subjects appertaining to aircraft. Flying instructor experience and previous M.U. test flying are an asset. He also needs a sound knowledge of English and ability to write a good report. Information may be obtained from the Empire Test Pilots' School, R.A.F., Cranfield, near Bletchley, Bucks.

CHAPTER IV

ARCHITECTURE AND PLANNING

ARCHITECTURE

ARCHITECTURE combines the spheres of art and science, and is primarily concerned with the design of buildings and supervision of their erection (or alteration or extension). Its scope includes practical building, historical development of architecture, properties and uses of materials, methods of construction, heating and ventilation, equipment, legal knowledge and the handling of people and of finance. There are three common modes of entry to the profession, the oldest being through the system of pupilage ; this is allied to attendance at evening classes or correspondence courses, and takes seven to nine years before full qualifications are obtained. Full-time study at a school of architecture leads to professional status in five years, while the third method is by full-time study for three years (up to Intermediate Examination standard) followed by part-time study and employment as an architectural assistant.

Authority to practise architecture in Great Britain is conferred by registration with the Architects Registration Council, after passing one of the professional examinations recognised by the Council. These examinations are conducted and recognised by the Royal Institute of British Architects, which has conducted examinations since 1863, and which publishes a booklet *Membership of the R.I.B.A.* (1945) including a map and schedule showing the distribution of facilities for architectural education. Details of the various regulations, examinations and scholarships may be obtained from the various schools of architecture. The Institute does not provide tuition, but maintains a Board of Architectural Education, which approves courses arranged by universities

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and schools of architecture, and certain of these are recognised for exemption from the Institute's Examinations.

The Architectural Association School of Architecture is a recognised school providing a five-year course in architecture. Entrance to the school is by examination. Students should have passed School Certificate, preferably with a credit in Art and Mathematics, before sitting for the examination. Students must have attained the age of seventeen before entry. The aim of the School is to produce young architects who will eventually make their own contribution to contemporary architecture.

After becoming a qualified architect, employment may be secured as an assistant to a practising architect, with a Government Department at home or abroad, with a public utility or commercial undertaking, or with a local authority. The architect may continue thus, or may ultimately enter private practice. Teaching posts may be secured on the staffs of technical and art schools and universities. The R.I.B.A. card index is available for use in connection with post-war employment, and contains the names of fully qualified architects—Fellows, Associates or Licenciates of the R.I.B.A., and others—who require posts. Particulars of students and probationers of the R.I.B.A. and others seeking posts as assistants are included. Inquiries should be sent to the Secretary, R.I.B.A., 66 Portland Place, London, W.1.

The Royal Academy Architectural School has been reopened, to provide a final course of one year for 10 selected students who have graduated in architecture. The course includes an intensive study of civic architecture, and preparation of designs for buildings of national importance. Candidates must submit portfolios of work and be interviewed by the Director.

BUILDING

The building industry offers varied scope for work in such positions as managers, agents, estimating and costing clerks,

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building inspectors and clerks of works, in addition to work as teachers of building technology. Entry may be made from modern, technical and grammar schools or universities. A full-time course may be undertaken prior to employment and practical experience ; or the student may enter an office of a building contractor or builders' merchant with prior full-time or concurrent part-time study ; or thirdly the student may enter as a craft apprentice, or as a craftsman after training under the Ministry of Labour Vocational Training Scheme, followed by part-time study and promotion through the grades of the industry.

Part-time courses are organised in day and evening classes in technical colleges and schools for those already employed in the industry. Full-time university courses are held at Manchester and Cardiff. Other full-time courses, lasting two or three years, are held in technical colleges, and train youths of about 16 years (at school certificate standard) for eventual progress to positions of responsibility in technical, supervisory, managerial or professional posts in the industry. Full-time courses are also held at Government Training Centres under the Ministry of Labour Vocational Training Scheme, lasting for six months.

The National Diploma and National Certificates in Building are issued by the Institute of Builders in conjunction with the Ministry of Education and the Scottish Education Department. Other technical qualifications in building are the Licenciate Diploma of the Institute of Builders, the Diploma of the Incorporated Clerks of Works Association, and the Building Inspectors' Certificate of the Institution of Municipal Engineers. The Ministry of Labour conducts special training schemes for adults entering the industry.

The Building Apprenticeship and Training Council has stated that 25,000 apprentices a year are needed to enter the building industry, and three reports have been issued making recommendations as to recruitment and training. Information regarding training schemes may be obtained from the Secretary, Building Apprenticeship and Training Council, Lambeth Bridge House, Albert Embankment, London, S.E.1.

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LAND AGENCY

Land Agency includes the management of landed estates which are agricultural, moorland or woodland, the repair of property, alterations and additions, letting and valuation. Qualifications are secured through membership of a professional institution, the Royal Institution of Chartered Surveyors, or Land Agents' Society. Training may be secured by taking a university degree in Estate Management (Cambridge or London), followed by practical experience in a land agent's office ; or by one year's practical experience on a farm, one year at an agricultural college, and two or three years in a land agent's office as a pupil or assistant while working for the professional examinations ; or by three or four years in a land agent's office as an articulated pupil or assistant with concurrent part-time study for the professional examinations. Tuition is provided by the Royal Agricultural College, Cirencester ; Shuttleworth College, Old Worden Park, Biggleswade, Bedfordshire, and other colleges ; and by the College of Estate Management, 11 Great George Street, London, S.W.1., which provide courses for the professional examinations, the London B.Sc. (Estate Management), and postal tuition.

The qualified land agent may obtain further experience as an assistant, before securing a resident or non-resident post with one or more estates, or entering private practice. The Ministry of Agriculture and local authorities employ land agents.

SURVEYING

Surveying has been described as " the art of determining the value of all descriptions of landed and house property, and of the various interests therein ; the practice of managing and developing estates ; and the science of admeasuring and delineating the physical features of the earth and of measuring and estimating artificers' work " (Charter of the Royal Institution of Chartered Surveyors). The student works by full-time study, or part-time study and practical experience, for membership of a professional body, and normally require

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a general education up to School Certificate standard. Land surveyors are employed by the Ordnance Survey Department, Chessington, Surrey, which conducts its own training scheme, taking entrants at the age of 16 ; entrants aged over 20 require to have been trained in surveying, draughtsmanship, printing or photography. The Colonial Survey Service requires entrants of 21 to 28 years with a degree in mathematics, physical science, engineering or geography ; the Diploma in Land Surveying of the Royal Institution of Chartered Surveyors ; a licence to practise as a surveyor in one of the Dominions ; or a degree or distinction regarded as equivalent to one of these. Courses of instruction are given to selected candidates at the Ordnance Survey Office, and at Cambridge in certain circumstances.

BUILDING SURVEYING

Building Surveying involves supervision of building construction, surveys and reports on structural and sanitary conditions of buildings, advice on and supervision of alterations and repairs, reports on disputes over rights of light and air and party walls, preparations of layout plans for development of land for building and drawings of specifications for construction of roads and sewers. The various modes of entry include a two or three years' full-time course to Intermediate Professional Standard at a technical college or the College of Estate Management, together with two years' practical experience and part-time study for the final professional examination ; employment with a firm of architects and surveyors and part-time study ; employment in a building or premises department which undertakes building and surveying, with part-time study ; pupilage with a borough engineer and surveyor, with part-time study ; or in certain special circumstances employment with a large firm of builders and contractors and part-time study for professional examinations. Professional status is gained by membership of the Royal Institution of Chartered Surveyors or of the Incorporated Association of Architects and Surveyors. The Royal Institute of British Architects holds an examination for candidates for

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the office of building surveyor under local authorities. The newly qualified building surveyor may remain with the firm with which he completed his training or join another firm, and ultimately proceed to the head of the surveying department, or he may practise on his own account or in partnership with an architect, or may enter the employ of a Government department, bank or insurance company.

QUANTITY SURVEYING

Quantity Surveying is concerned with the preparation of estimates of the amount of materials and labour required for buildings and other constructional work, pricing bills of quantities, making estimates of costs of buildings, advising on alterations to buildings, preparing architects' specifications, and arbitrating in disputes in connection with building contracts. Training is secured either by a two or three years' full-time course at a technical college or the College of Estate Management, followed by two years' practical experience; or by an articled pupilage or assistantship in a firm of quantity surveyors for four years with concurrent part-time study at a technical college or correspondence course; or in certain special circumstances by employment in a large firm of builders and contractors with part-time study, leading to the professional examinations of the Royal Institution of Chartered Surveyors or the Incorporated Association of Architects and Surveyors. After qualifying the surveyor may practise on his own account or in partnership, or enter a local authority or Government department, or a large firm of building contractors.

URBAN SURVEYING

Urban Surveying involves the management and development of urban estates, the sale or purchase and letting or renting of property, dilapidations, supervision of repairs, sanitation and valuations, and the law relating to land and buildings in towns. It may overlap with other branches of surveying, and professional status is granted by the Royal

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Institution of Chartered Surveyors, the Auctioneers' and Estate Agents' Institute, the Incorporated Society of Auctioneers and Landed Property Agents, and the Incorporated Association of Architects and Surveyors. Training is secured either by an articulated pupilage of four years or junior assistantship with an approved firm of urban surveyors with concurrent part-time study ; or by a two or three years' full-time course of study at the College of Estate Management or at a technical institute, leading to the Intermediate professional examination, followed by two years' practical experience in approved employment with part-time study for the final professional examination ; or by taking a B.Sc. degree in Estate Management (London), or a B.A. Estate Management (Cambridge), followed by two years' practical experience. Employment may be found with a large firm, a local authority, Government department, or in private practice.

TIMBER DEVELOPMENT

The Timber Development Association Ltd., 75 Cannon Street, London, E.C.4., sponsors a three-year course in Timber Technology for those interested in the study of timber, designed to meet the needs of men and women employed in connection with the timber trade or timber consuming industries. Classes are held in Technical Institutions and lead to the award of a certificate on the successful completion of the course and final examination in the third year.

Classes have been established at Aberdeen, Birmingham, Brighton, Bristol, Cambridge, Canterbury, Cardiff, Chelmsford, Edinburgh, Erith, Exeter, Gillingham, Glasgow, Gloucester, Grangemouth, Gravesend, Hammersmith, Hitchin, Hull, Ipswich, King's Lynn, Leeds, Letchworth, Liverpool, London, Lewisham, Luton, Maidstone, Maldon, Manchester, Newcastle, Northampton, Norwich, Nottingham, Portsmouth, Southampton, Stevenage, Sunderland, Torquay, and West Hartlepool. Further classes are being organised at Bolton, Bournemouth, Burton-on-Trent, Derby, Leicester and Yarmouth.

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TOWN AND COUNTRY PLANNING

Town Planning is concerned with the preparation and administration of statutory schemes under the Town and Country Planning Acts, the preparation of development plans, and the issue of consultant advice. The student requires a good general education up to School Certificate standard, and technical training in architecture, civil engineering or surveying is an advantage.

Professional status is obtained through membership of the Town Planning Institute. Diplomas in Town Planning are offered by the Royal Institute of British Architects and the Royal Institution of Chartered Surveyors, and a Certificate by the Institution of Municipal Engineers. Diploma courses are conducted at the universities of Durham, Liverpool, London and Manchester. A B.A. degree with honours in Town and Country Planning has been instituted at King's College, Newcastle-upon-Tyne, with a view to training planners to deal with questions of the use of land for industry, agriculture, education, housing, recreation and so on as well as with layout of buildings, roads and services; the course extends over five academic years. Certain technical and art colleges also offer courses.

The qualifying examination for town planners is conducted by the Town Planning Joint Examination Board, comprising representatives of the Royal Institute of British Architects, the Town Planning Institute, the Royal Institution of Chartered Surveyors and the Institution of Municipal Engineers. The Board is the examining body for the Town Planning Diploma of these institutions.

The Town Planning Institute organises an annual summer school, which acts as a refresher course for practising planners.

The School of Planning and Research for Regional Development trains men and women in the technique of planning. During the war the school conducted a correspondence course for the War Office, and a series of special Three Months' Completion Courses have been run since the war for demobilised men and women. The One Year Diploma Course in Planning, open to approved students holding a university

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degree or professional qualification, commenced in September 1947. A series of short courses, designed for senior members of planning staffs, opened in September 1947; officers of the Ministry of Town and Country Planning will be permitted to assist in the instruction, and local planning authorities are encouraged to facilitate the participation of their officers in the courses. An overseas correspondence course in planning is available for residents in English speaking countries outside the British Isles.

Employment for the fully qualified town planner may be found with local authorities, the Ministry of Town and Country Planning (in Scotland the Department of Health), in private practice and in teaching.

Associated with town and country planning is the work of specialists in the fields of economics, geography, sociology and geology. Research officers, who should hold a university degree and have research experience, are employed by the Ministries of Town and Country Planning and Agriculture and by local authorities. Research assistants and cartographers are also needed.

Landscape architecture is a specialised aspect of town and country planning, concerned with blending structures with the natural features to secure harmonious landscape. The Institute of Landscape Architects holds an examination leading to Associateship of the Institute. A three-year diploma course is available at Reading University, while the School of Planning and Research for Regional Development conducts a two years' evening course in Landscape Design to prepare students for the final examination of the Institute of Landscape Architects.

CHAPTER V

COMMERCE AND FINANCE

ACCOUNTANCY

AN accountant, who is mainly concerned with the preparation and auditing of accounts, may be employed with a private firm of accountants, establish his own practice, join the staff of an industrial company, become a company secretary, or work for a local authority or government department.

The entrant, at the age of 16 or 17, should have a good general education, and should combine practical experience in an accountant's office with study for the professional examination conducted by one of the following bodies, from which details may be obtained : The Institute of Chartered Accountants in England and Wales, Moorgate Place, London, E.C.2 ; The Societies of Chartered Accountants of Scotland (General Examining Board), 142 St. Vincent Street, Glasgow ; The Society of Incorporated Accountants and Auditors, Victoria Embankment, London, W.C.2 ; The Association of Certified and Corporate Accountants, 22 Bedford Square, London, W.C.1 ; The Institute of Municipal Treasurers and Accountants, 1 Buckingham Place, Westminster, London, S.W.1.

COST ACCOUNTANCY

Cost accountancy is a specialised branch of accountancy mainly concerned with methods to secure maximum productive efficiency by a strict control over expenditure. Candidates should have a good general education up to the age of 16. A post may be obtained in the costing department of a works or undertaking, while studying for the examinations of the Institute of Cost and Works Accountants, which grants associateship and fellowship qualifications. The demand for

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cost accountants, which increased greatly during the war, may continue to do so as modern production methods are increasingly valued in industry. There is some scope for private practice.

Details may be obtained from the Director, Institute of Cost and Works Accountants, 23 Queen Square, London, W.C.1.

ACTUARIES

The Actuary is concerned with the application of the theory of probability and compound interest to practical problems. The bulk of the employment is provided by insurance companies, but there is increasing scope in Government departments, commerce, transport and industry generally, as well as in private practice; for, *inter alia*, the actuary is of necessity also a trained statistician and is, in fact, regarded by the Treasury as fitted for statistical work in Government service at all levels.

A good general education up to at least matriculation standard is required, but the would-be actuary should preferably have reached Higher Certificate standard in mathematics before entering employment in a Life Office. The Offices also recruit a number of university graduates in mathematics who are granted certain exemptions from the professional examinations. Professional status is granted by the Institute of Actuaries, Staple Inn Buildings, Holborn, London, W.C.1., and by the Faculty of Actuaries, 23 St. Andrew Square, Edinburgh, from which bodies full details may be obtained.

BANKING

Entrants to banks, normally between the ages of 16 and 19 years, are required to have reached School Certificate standard in general education. Applications should be sent to the Staff Manager or Secretary of the bank concerned.

Professional qualifications are granted by the Institute of Bankers and the Chartered Institute of Secretaries, while

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employees may also read for university degrees in Commerce and Economics. The Institute of Bankers offers a Diploma in Executor and Trustee work and a Banking Diploma, in addition to a Commercial Diploma. Application for details should be sent to the Secretary of the Institute.

Similar conditions are offered by the Institute of Bankers in Scotland, George Street, Edinburgh.

Applications for entry to the Bank of England should be sent to the Chief of Establishments, Bank of England, London, E.C.2.

Successful clerks may be promoted to the grades of assistant manager, manager and general manager, while there are other senior posts for accountants, inspectors, chief cashiers and heads of departments. Qualifications in languages may be utilised in branches in foreign cities and in metropolitan branches dealing with foreign business.

INSURANCE

Entry to an insurance company is generally made at the age of about 16, by those who have reached School Certificate standard. In addition to training within the firm, it is usually considered an asset to work for the professional qualifications offered by the Chartered Insurance Institute, 20 Aldermanbury, London, E.C.2, the Corporation of Insurance Brokers, 3 St. Helen's Place, London, E.C.3, or the Association of Average Adjusters, 70 Old Broad Street, London, E.C.2, from which full details may be obtained.

SECRETARIAL WORK

Training for secretarial work involves practical experience combined with study leading to professional qualifications, which are granted by the Chartered Institute of Secretaries, Princes House, 95 Gresham Street, London, E.C.2, and by the Corporation of Certified Secretaries, Secretaries' Hall, 28 Fitzroy Square, London, W.1. Practical experience may be gained by entering a commercial undertaking or firm of accountants.

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Opportunities for employment are varied, and include work with professional persons, institutions, hospitals, various societies, trade unions, professional or trade organisations, and public and private companies.

Women who wish to become private secretaries generally require some training in shorthand and typing. A university degree and linguistic ability are assets in some branches of the work.

STATISTICS

The use of statistics is becoming rapidly more important and widespread in government, industry and scientific research. The Royal Statistical Society, in a report *The Teaching of Statistics in Universities and University Colleges* (1947) draws attention to the urgent need for expanding facilities for instruction in statistical methods for the benefit of both those studying other sciences and for general practitioners in statistics.

Most universities conduct courses in statistics, in connection with economics.

Information may be obtained from the Royal Statistical Society, 4 Portugal Street, London, W.C.2.

STOCK EXCHANGE

Members of the "House," either brokers or jobbers, must be recommended by other members before being authorised to conduct business, and require considerable capital.

A youth may enter a firm of brokers or jobbers at about the age of 16, having attained a good all-round education.

Practical experience may be supplemented by attendance at classes and study for the examinations of the London Chamber of Commerce. There is no formal professional training.

CHAPTER VI

ENGINEERING

ENGINEERING, which has been defined as the "art by which the properties of matter are made useful to man in structures and machines," is the largest profession offering careers in the field of industrial science, and is varied both in the branches in which the engineer may specialise and in the type of work which he may undertake. Entry to the profession may be made at various stages. Boys entering from school, without any examination qualification, generally become skilled craftsmen, and may rise to professional status by part-time study. It is possible to enter a junior technical school for full-time general technical education, between the ages of 13 and 16, but these provisions will be altered under the new Education Act. Pre-apprenticeship courses are popular, providing a one-year course for boys between leaving school and commencing apprenticeship at about the age of 16, while many firms have instituted apprenticeship training schemes, lasting for three years or longer, in order to facilitate the promotion of those with ability, with mutual benefit both to the industry and the employee; some of these courses are extended to include girl employees. These courses lead to the award of the National Certificates, the Higher Certificate being accepted by some of the professional institutions in lieu of part or whole of the membership examinations, and it is possible for some of the holders to proceed to the universities.

Boys of 16 or 17 who have attended modern or technical schools (according to the interpretation of the 1944 Education Act) may proceed similarly to attain National Certificates through an apprenticeship or may take a National Diploma as full-time students at technical colleges. It should be noted, however, that the Act makes it compulsory for

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every local education authority to provide adequate facilities for further education, full-time or part-time, for persons over compulsory school age not in full-time attendance at an educational institution or receiving satisfactory training.

The boy leaving school at 18 may proceed to a university and take a degree, or may take some practical training prior to a university course, or may become an apprentice and work for a degree or for the National Certificates by part-time study, or may take a full-time course of technical training at a technical college and work for the Higher National Diploma or professional institution qualification. Entry to a university can be secured by the student who has attained matriculation standard ; the course for an engineering degree lasts for three or four years. In some cases technical colleges also provide courses leading to degrees, and particulars should be obtained from the appropriate local education authority or technical college, or in Scotland from the Scottish Education Department, St. Andrew's House, Edinburgh, 1. The degree course requires specialisation in one of the branches of engineering, while in some cases internal diplomas are also granted at the graduate and post-graduate stage.

The majority of engineers, graduates and others, become members of one of the professional institutions, which, while they do not hold regulating powers, provide facilities for the exchange and dissemination of knowledge and ideas, as well as recognised professional standards of attainment. A general educational standard equivalent to that of the School Certificate examination is usually required from candidates for non-corporate membership, while corporate membership is open to those with the requisite academic qualifications and practical experience.

Experience of war-time training in the Forces has had the effect of changing the emphasis from technical education to functional training, and this may have repercussions in industry. Firms are making use of vocational selection of students for various branches of engineering to which they are best suited, and the rôle of training is then to teach them the principles of the job, followed by functional training to

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teach them how to apply those principles to the specific job. This can be applied to every branch of work within the industry, and can produce results more quickly and efficiently than the older more haphazard methods of finding a suitable niche.

Although the numbers of qualified women engineers are comparatively small, they have steadily increased, and the Women's Engineering Society urges that encouragement and training facilities should be freely available to those whose talents lie in this direction. Most branches of the engineering profession are now open to women.

AERONAUTICAL ENGINEERING

Aeronautical engineering comprises the design and construction of aero-engines and airframes, propellers, de-icers, hydraulic and electric systems, etc.; research; and the production of aircraft engines and equipment. Engineers may specialise in the construction of airframes or of aero-engines, while airframe designers may specialise in aeroplane or flying boat design.

The qualified engineer may find employment with firms manufacturing airframes or aero-engines; with civil air transport companies in servicing and repair workshops; with research establishments such as the Royal Aircraft Establishment at Farnborough or the National Physical Laboratory at Teddington; in research and teaching at universities and technical or aeronautical colleges; with the Fighting Services; with a Government department such as the Air Ministry, the Ministry of Supply or the Admiralty; or in technical journalism.

There are two main modes of entry to the profession. A full-time university course in engineering may be followed by or sandwiched with a course of practical training in industry, usually taking five years in all; this may be followed by further research and specialisation, and may lead to posts in design offices and laboratories of aircraft firms or Government

aeronautical research establishments. The other mode of entry is to undertake practical work in an aircraft firm with concurrent part-time technical study, lasting about five years in all. Many large aircraft firms operate schemes of workshop training correlated with day-time technical education leading to the Ordinary National Certificate in Mechanical Engineering, followed by the Higher National Certificate with endorsements in aeronautical engineering, and associate fellowship of the Royal Aeronautical Society. A student wishing to specialise in research should acquire a degree in engineering, mathematics, physics, chemistry or electricity, according to his branch of work, and pass the Royal Aeronautical Society's examination, or gain the Higher National Certificate in Mechanical Engineering.

Full-time courses in aeronautical engineering are available at the universities of Bristol, Cambridge, London, and University College, Southampton, while some technical colleges provide facilities for reading for the London external degree. The Royal Aircraft Establishment Technical College, Farnborough, Hants, provides specialised training and education in aeronautical engineering, and engineering apprentices, on completion of their training, are accepted in the research laboratories and the design offices; applications for admission should be made early in April of the year of entry.

The Department of Aeronautics at the Imperial College of Science and Technology, South Kensington, London, S.W.7, is mainly a post-graduate department, providing one year courses in aerodynamics and the design and construction of aero-engines, with a second year course for students desiring to undertake research. At the College of Aeronautics, Cranfield, Bletchley, Buckinghamshire, two year courses are available for selected students of graduate standard, trained in engineering, physics or mathematics, but a university degree is not an essential qualification. Technical membership of various professional organisations constitutes a recognised qualification; these include the Royal Aeronautical Society, the Institution of Mechanical Engineers, and the Institution of Production Engineers.

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AUTOMOBILE ENGINEERING

Automobile engineering is a specialised form of mechanical engineering, and is concerned with road vehicles and other self-propelled vehicles driven by internal combustion engines, such as farm tractors and military tanks. An all-round knowledge of automobile engineering is advised before specialisation, but a general choice is made between chassis engineering and body engineering.

Part-time students work for the National Certificates in mechanical engineering, possibly with endorsement in automobile engineering. Full-time students may take a university degree in mechanical engineering, or full-time or sandwich courses in technical colleges.

The Institution of Automobile Engineers offers professional qualifications, and details should be obtained from the Secretary. The Institution also publishes a leaflet, *Recommended Course of Training for Automobile Engineers*, which may be obtained from the Secretary. It recommends that intending automobile engineers should matriculate before leaving school, and then obtain training in the theory and practice of engineering in both college and engineering workshop, either following a three-year full-time day course at a technical institute to secure an engineering degree or diploma followed by a pupilage course of three years in an engineering works ; or a three or more years' apprenticeship in an engineering works supplemented by evening or part-time day classes to secure a National Certificate, followed preferably by a full-time course at a technical institution to secure a degree or diploma ; or a sandwich course combining the two. The leaflet includes advice on practical training, lists of institutions offering full-time courses for diplomas and degrees, evening and part-time day courses for National Certificates, and information on recommended evening-class work for automobile students.

CHEMICAL ENGINEERING

The intending chemical engineer should take a university degree, but there are several approaches. He may take a

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degree in chemical engineering, spending part of his vacations at a chemical works. Another line of approach is to take a degree in chemistry or engineering, with a post-graduate year in chemical engineering. Post-graduate research, leading to a research degree, would be advantageous in securing a lectureship.

Chemical engineering is an expanding profession, and facilities for education and training are increasing. The Shell group of oil companies has endowed a school of chemical engineering at Cambridge. Courtaulds have provided a chair at the Imperial College of Science and Technology, while Mr. C. F. Brotherton has given a sum of money to the University of Leeds for chemical engineering development.

The demand for chemical engineers has led the Ministry of Education to arrange for full-time training courses in a number of technical colleges, lasting for one year, and available to men who have graduated in engineering, physics and chemistry, or have other recognised qualifications (i.e. the Higher National Certificate in engineering or chemistry, or a general science degree in mathematics, chemistry and physics). The courses, which are recognised by and operated in co-operation with the Institution of Chemical Engineers, qualify for allowance under the Further Education and Training Scheme. Details are given in the Ministry of Labour leaflet P.L.216, and applications should be made to the Technical and Scientific Register, York House, Kingsway, W.C.2.

Chemical engineers are needed, according to a memorandum by the Institution of Chemical Engineers and associated bodies, for the rehabilitation of the chemical and petroleum industries, in the plant industry, to design chemical plant for direct export, and for overseas work in the British Commonwealth. A syllabus for a degree course in chemical engineering is published by the Institution.

Chemical engineers are also needed to design and operate plant used in the commercial development of chemical products, including bio-chemical and agricultural chemical products. The courses cover chemical engineering processes, chemical plant construction, factory design and construction, and industrial economics.

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The Institution of Chemical Engineers offers various grades of membership and further details should be obtained from the Secretary at the Institution. The Associate Membership Examination of the Institution is held annually. A copy of *Extracts from the By-Laws* and *Hints to Candidates* can be obtained free, and past Examination papers at 1s. per set, from the Joint Hon. Secretaries of the Institution, 56, Victoria Street, London, S.W.1.

CIVIL ENGINEERING

Civil Engineering is mainly concerned with constructional work in connection with transport (roads, railways, tunnels, bridges and harbours), services (water, gas, electricity, and sewerage) and construction of large buildings. The Institution of Civil Engineers' Examinations allow for specialisation in one of the following groups : Constructional and Public Works Engineering ; Aeronautical Engineering ; Chemical Engineering ; Electrical Engineering ; Gas Engineering ; Mechanical Engineering ; Mining Engineering ; Shipbuilding and Marine Engineering ; Structural and Building Engineering.

Professional status is reached through membership of the Institution of Civil Engineers, and of other institutions such as that of Water Engineers. There are various modes of training. A student may enter an engineering concern at the age of 16 as an apprentice or pupil, and, by part-time study over four to five years, work for the Higher National Certificate in Civil Engineering, and ultimately for an external engineering degree ; or having entered a works as an apprentice at 16 and taken a course of part-time study, he may later proceed to a full-time university course for a degree, and become a junior engineer. A student having obtained a Higher School Certificate may proceed at the age of 18 direct to a university, or after one year as an apprentice ; and after taking a degree he may become a student apprentice in the office of a civil engineering concern ; practical experience in a mechanical engineering firm is an advantage. Degree courses in civil engineering are conducted at the universities of Aberdeen, Belfast, Birmingham, Bristol,

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Cambridge, Durham (King's College, Newcastle-on-Tyne), Edinburgh, Glasgow, Leeds, Liverpool, London, Manchester, Oxford, St. Andrews, Sheffield, Wales (Cardiff and Swansea), and the University Colleges of Nottingham and Southampton.

ELECTRICAL ENGINEERING

The main branches of electrical engineering are power generation and distribution, heavy manufacturing, traction, installations, meters and instruments, and telecommunication. The Institution of Electrical Engineers recommends a full-time educational course at a university leading to a degree in electrical engineering, combined with a post-graduate apprenticeship (lasting at least two years); one year of the apprenticeship may be taken before the university course, on the whole of it may be taken afterwards. Additional practical training should be taken during the summer vacations. Students who have not matriculated may pursue similar full-time courses at university and technical colleges, leading to the Higher National Diploma, or to college diplomas. "Sandwich courses" are available in some areas, wherein periods of practical training are alternated with full-time education. The Institution also recommends, for suitable students, a part-time education course at a technical college or school, leading to the Ordinary National Certificate in electrical engineering, and then to the Higher National Certificate; these are taken while serving an engineering or student apprenticeship.

Admission to corporate membership of the Institution of Electrical Engineers is a recognised qualification and full details should be obtained from the Secretary of the Institution, which also publishes a list of universities and colleges having full-time courses, and of colleges providing courses leading to National Certificates and Diplomas. The Institution, in its report on *Part-time Further Education at Technical Colleges* (1945), makes recommendations for provision of education for the groups of craftsmen, technicians, and professional engineers, and for the further education and training of electrical engineers returning from the Services.

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There is increasing scope for women in certain branches of electrical engineering, particularly in connection with design and research, and information may be obtained from the Women's Engineering Society. A Certificate and Diploma in Electrical Housecraft for teachers and electrical demonstrators and saleswomen are awarded by the Electrical Association for Women. Further information may be obtained from the Director, Electrical Association for Women, 20 Regent Street, London, S.W.1, which has published an interim report on *Post-War Reconstruction*, giving opinions on education and careers.

GAS ENGINEERING

Gas engineering may be regarded as a branch of chemical engineering, concerned with "the manufacture and operation of apparatus for the preparation and utilisation of coal gas in every department of domestic and industrial life where a readily and accurately controlled source of smokeless heat is required." The gas engineer may be concerned either with the manufacture, distribution and utilisation of gas, with gas engineering and contracting, with commercial management or with research.

In general a pupil engineer should hold a B.Sc. degree, in chemistry, physics, metallurgy, engineering, mathematics, chemical engineering, mechanical engineering, or fuel technology, according to which branch is chosen for specialisation. The Institution of Gas Engineers has an education scheme for those who enter the industry from the secondary school, and boys recruited at 16 to 18 years can enter either the commercial or engineering and chemical branches, and work for the Associateship Diploma of the Institute of Chemistry, or the Diploma in Gas Engineering (Manufacture or Supply) of the Institution of Gas Engineers. The Institution offers various grades of membership, and various certificates in gas engineering, full details of which may be obtained from the Secretary at the Institution, 1 Grosvenor Place, London, S.W.1, from whom guidance on careers may be obtained.

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Corporate members of the Institution are described as chartered gas engineers.

Education for gas engineering may undergo changes in line with those proposed in the organisation of the industry. The Committee on the Gas Industry has made recommendations which seem to point to a wider separation of the functions of management from those of the professional engineer, when the industry is organised in larger regional units. The Institution of Gas Engineers has agreed to the introduction of an associate membership examination, and to proficiency tests in gas technology for technical personnel.

HEATING AND VENTILATING ENGINEERING

Heating and ventilating engineering is concerned with the heating, ventilation and air-conditioning of buildings, refrigeration, hot water supplies and centralised fire prevention. This is strictly a branch of mechanical engineering, and training in the principles and practice of mechanical engineering is necessary. Two years' practical training on site work is recommended. The Education Board of the Heating and Ventilating Industry is responsible for organising training for craftsmen and for professional heating and ventilating engineers. A three years' part-time course leads to the Ordinary National Certificate in Mechanical Engineering and may be followed in a technical college. A six months' full-time course of specialised instruction comprises the second part of the training, and has been introduced at the Borough Polytechnic, 103, Borough Road, London, S.E.1. Financial assistance is provided by the Association of Heating, Ventilating and Domestic Engineering Employers to students employed by firms who are members of that Association. Information may be obtained from the Secretary, Education Board of the Heating and Ventilating Industry, 103, Borough Road, London, S.E.1. Professional status is obtained by membership of the Institution of Heating and Ventilating Engineers. After completion of training, employment is sought with Government departments, local

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authorities, and consultants and contractors in heating and ventilating engineering.

LOCOMOTIVE ENGINEERING

Locomotive Engineering, another branch of mechanical engineering is concerned with design, research, supervision, management or administration for railway companies, firms of locomotive contractors, and makers of locomotive accessories. Apprentices must have received a good general education to School Certificate standard, and practical training of at least three years' duration ; this may be obtained in the workshops of a firm of locomotive contractors or a railway company.

Membership of the Institution of Locomotive Engineers requires the qualifications which are listed in Appendix G. Further details of these and general information regarding forms of training may be obtained from the Secretary of the institution.

MARINE ENGINEERING

Marine Engineering is the branch of mechanical engineering concerned with the machinery installed in ships. The personnel concerned includes engineer officers in the Royal Navy, engineers employed by shipping companies, by firms of marine engine builders and repairers, and engineers employed by Government departments, public undertakings, etc. The only branch coming within the scope of this chapter is that concerned with firms of marine engine builders and repairers, for which the scope includes design, development, administration, production and repair. The training is similar to that for mechanical engineers, but sea-going experience is an asset to design or development.

The chief centres of marine engineering are inevitably located in the shipbuilding regions, where facilities for higher technical education are provided in the universities and technical institutions. Early workshop training and technical education to the Ordinary National Certificate standard,

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however, may be obtained respectively in any heavy mechanical engineering works and technical college.

The Institute of Marine Engineers offers qualifications, and further details should be obtained from the Secretary, or from the Secretary, Institution of Engineers and Shipbuilders in Scotland, Elmbank Crescent, Glasgow, C.2, or from the Secretary, North-East Coast Institution of Engineers and Shipbuilders, Bolbec Hall, Newcastle-on-Tyne.

MECHANICAL ENGINEERING

Mechanical Engineering is the largest of the main branches of the engineering profession, while a knowledge of mechanical engineering is essential for other professions in industry.

Practical training is recommended to precede full-time technical training, while some branches require special practical experience at a later stage. Professional qualifications offered by the Institution of Mechanical Engineers are listed in Appendix G.

The Institution of Mechanical Engineers has issued a report on training, in which it suggests that the teacher should become a practising engineer at regular intervals, and greater use be made of industrial refresher courses. It also believes that there should be wider provision for craft courses in technical colleges, and a certificate scheme on a national basis for craft students.

Mechanical engineers may obtain posts in the Admiralty, Post Office, Air Ministry, War Office and other Government departments, while in industry they may fill such posts as managing director, chief engineer, general manager, works manager, designer, research worker, consulting engineer, planning engineer, or inspector, or may become technical journalists, or lecturers or teachers.

MINING ENGINEERING

Mining engineers in the coal industry were usually employed by mining companies, but will now come under the National Coal Board. There are also openings as inspectors

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under the Ministry of Fuel and Power, in teaching and in technical journalism. Entry to the profession may be gained either by doing practical work underground for five years in a mine, with concurrent part-time study at a technical college, or by taking a university degree or diploma followed by practical training for three years; the latter period may be reduced by doing some of the practical work during vacations. Both types of students take the Certificate of Competency, issued by the Ministry of Fuel and Power to those who pass the examinations of the Board for Mining Examinations. The first class certificate is a qualification for management of mines, while the second class is needed for under-management. Professional status is granted by the Institution of Mining Engineers, of which particulars are given in the appendix. Further details may be obtained from the Secretary at Salisbury House, Finsbury Circus, London, E.C.2.

Those who wish to specialise in metalliferous mining should attend a course at one of the institutions specialising in metalliferous mining, i.e. the universities of Birmingham, Durham, Edinburgh, and Leeds, the Royal School of Mines in London, and the School of Metalliferous Mining at Camborne, Cornwall. Employment in various capacities is generally found with a mining company, as well as in inspection and teaching; most of the openings are to be found abroad.

Those wishing to specialise in oil prospecting and production should follow a university course in oil engineering, or a combination of geology and engineering. Post-graduate courses in oil exploration and exploitation are available at Birmingham. Professional status is granted by the Institute of Petroleum.

MUNICIPAL ENGINEERING

Municipal Engineers are concerned with the construction and maintenance of roads and bridges, sewerage, sewage disposal, town and country planning, construction and maintenance of swimming baths, flood prevention, river works,

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supervision and erection of residential and business premises, street lighting, refuse collection and disposal, water supply, construction and maintenance of tramway tracks, surveying and other related work. In addition to qualifications in municipal and civil engineering, a knowledge of mechanical and electrical engineering is advantageous, while qualifications in architecture are useful. The recommendations made in the report of the Joint Committee of the Institution of Civil Engineers and the Institution of Municipal Engineers relating to engineering training of municipal engineers came into operation in July 1944. The scheme is administered by the two Institutions, and a standing joint committee is responsible for preparing and maintaining an index of engineers of local authorities willing and able to provide persons with practical engineering training under the stated conditions, and for keeping a register of indentures or undertakings of persons undergoing such training. The index of engineers is confined to corporate members of either or both of the Institutions. Persons receiving training are classified as pupils under indenture (including apprentices); graduate assistants under an undertaking (A); and engineering learners under an undertaking (B). Every engineer to a local authority wishing to be included in the index must undertake to give adequate practical training and to supervise such training with a view to signing a certificate on completion thereof; he shall accept a limitation of the number of persons training under him at the same time, on a given basis. A pupil must be over sixteen, and the duration of his indentures must be at least three years and last up to the age of 20; he will undergo a probationary period of at least three months, pass the common preliminary examination or its equivalent, follow approved theoretical studies at a technical college or otherwise, and enter for sections A and B of the Associate Membership Examination of the Institution of Civil Engineers or the Testamur of the Institution of Municipal Engineers. A graduate assistant must hold an approved engineering degree, spend two years under an undertaking, receive practical training in all branches of the work and experience in the various departments of the office and on the works equivalent

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to those enjoyed by persons serving a pupilage. An engineering learner must be over 17, pass the Common Preliminary Examination or the equivalent, train for at least three years, study at a technical college or otherwise, and enter for Sections A and B of the Associate Membership Examination of the Institution of Civil Engineers or the Testamur of the Institution of Municipal Engineers. Professional status is granted by the Institutions of Civil Engineers and Municipal Engineers. Employment is sought with local authorities, and the degree of specialisation will vary with the size of the authority. Further specialised qualifications are obtained by membership of the Institutions of Highway Engineers and Sanitary Engineers.

NAVAL ARCHITECTURE

The term Naval Architecture covers the design and construction of every kind of ship and vessel, from the largest battleship or Atlantic liner to the smallest coastal motor boat or harbour launch. A good general education is required, and training, as for other engineering courses, is partly theoretical and partly practical, of which the former may be gained at a technical college or university, and the latter in a shipyard. Some experience in marine engineering works is advantageous. Ordinary and Higher National Certificate courses may be pursued in technical colleges in the shipbuilding regions, or degree courses at the universities of Glasgow, Liverpool and Durham (Newcastle Division).

His Majesty's ships are primarily designed by the Royal Corps of Naval Constructors, who undergo a three years' course at the Royal Naval College, Greenwich. Candidates must pass an entrance examination in mathematics, engineering science and practical knowledge of shipbuilding. Details may be obtained from the Secretary of the Admiralty (C.E. Branch).

The Institution of Naval Architects offers various grades of membership, and awards and administers annually a number of scholarships in Naval Architecture and Marine Engineering. Full details may be obtained from the Secretary. Other bodies which offer membership are the Institu-

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tion of Engineers and Shipbuilders in Scotland, Elmbank Crescent, Glasgow, C.2, and the North-East Coast Institution of Engineers and Shipbuilders, Bolbec Hall, Newcastle-on-Tyne.

PRODUCTION ENGINEERING

Production engineering is concerned with production generally, to organise manufacture on an economic basis, and its sphere includes chiefly works management, production management, planning, workshop layout, jig and tool design, estimating, time-study, rate fixing, motion study, inspection, purchasing and store-keeping.

Students should have varied workshop experience, followed by specialisation. Higher National Certificates may be taken, while some technical colleges offer "Post Higher" training. The Institution of Production Engineers offers qualifications which are listed in Appendix G. Details should be obtained from the Secretary.

RADIO ENGINEERING

Radio Engineering is a specialised branch of Physics. In a report on *Post-War Development in Radio Engineering*, with reference to education and training, the British Institution of Radio Engineers states that the radio industry offers better prospects than it did prior to 1939, and believes that the degree course facilities in physics and radio in the universities should be used, as well as courses of study in radio engineering and servicing in the technical colleges. It recommends the establishment of a nationally-recognised examination in radio science. The five main categories of workers in radio engineering that are distinguished are: (a) Senior research and other advanced workers drawn mainly from the universities; (b) ancillary staff, recruited mainly from young persons aged 17 to 20 of an educational standard equivalent to the Higher School Certificate, and who study for the National Certificates with endorsement in radio engineering; (c) technicians, recruited at the age of 16 and over with an educational qualification equivalent to matriculation, and who study for the City and Guilds of London Institute Certificate or the British Institution of Radio

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Engineers Graduateship examinations ; (*d*) skilled craftsmen, who work for the first certificate in radio engineering, and the first two City and Guilds examinations in radio communications, the radio service examination of the City and Guilds of London Institute, and the certificate of the Radio Trades Examination Board ; and (*e*) semi-skilled and unskilled labour.

Information regarding qualifications may be obtained from the Secretary of the British Institution of Radio Engineers, which also maintains a register of employers' and employees' requirements.

Many radio manufacturers have their own trainee schemes, lasting three, four or five years, leading to National Certificates and City and Guilds of London Institute Certificates in technical electricity and radio communication. It is estimated that some post-war employment may be anticipated in civil aviation for radio engineers, and there are opportunities for radio research in connection with navigation and other aids. The Institute of Aeronautical Engineers offers an optional paper on R.D.F.* work in its examination. The British Broadcasting Corporation conducts a training department for engineering staff already employed by the Corporation. The Radio Trades Examination Board, 9 Bedford Square, London, W.C.1, offers a radio servicing certificate for candidates of 17 years and upwards.

REFRIGERATING ENGINEERING

Refrigerating engineering is a branch of mechanical engineering which requires sound knowledge of the fundamentals of engineering, particularly of the theory of heat engines, and some interest in biological sciences. Employment may be found in the design and manufacture of refrigerating machinery, equipment and accessories, and in the construction of insulated space for cold storage of various types, as well as of air-conditioning plant (a branch of heating and ventilating engineering).

* Radio Direction Finding.

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The student should obtain a qualification in mechanical engineering, then obtain employment with a firm specialising in his particular interest. Few courses are held in technical institutions. Details may be obtained from the Secretary, Institute of Refrigeration, which has a qualified membership class.

STRUCTURAL ENGINEERING

Structural Engineering is concerned with the erection of public and industrial buildings, bridges, theatres, water towers, hangars and similar structures. Knowledge of architecture, physics, chemistry, metallurgy, and geology is advantageous, in addition to the "strength of materials" and "theory of structures" branches of engineering science. The Institution of Structural Engineers issued in 1928 and revised in 1934 a report on education, professional training and employment in structural engineering. This states that training may be taken at a university where a general science degree should be followed by a technical post-graduate course in engineering or building, after which entry to a firm of practising structural engineers would provide the practical experience necessary to prepare for the examinations of the Institution of Structural Engineers. Alternatively training may be taken by entry to a technical college at about 16 years, where a three years' full-time course would be followed by employment with a firm and part-time study at a technical college for the professional examinations, or by entry to the office of a structural engineering firm, with part-time study at a technical college for five years for the professional examinations. The two latter courses would lead to the Ordinary and Higher National Certificates in Building or Engineering. Employment may be obtained with a Government department, local authority, public utility undertaking, industrial concern, civil engineering contractor, or a firm of consulting engineers.

WATER ENGINEERING

Water Engineering is concerned with the conservation of water in lakes, rivers and artificial reservoirs, well supplies,

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making the water available in pure form in the communication pipe to the consumer's premises ; the construction of dams and water towers, sinking of wells, erection and equipment of pumping stations and laying of trunk mains and distribution pipes ; and of land drainage and irrigation. For this work civil engineers require specialised knowledge of hydraulics and geology, pumping machinery, electricity and chemistry and bacteriology. Training may be gained either by acquiring a university degree in civil engineering followed by employment as an assistant under agreement to a qualified water engineer ; or by becoming, on leaving school, an articled pupil to a practising water engineer for four or five years, and attending part-time courses at a technical college, thus combining practical experience and study for the examinations of the Institution of Civil Engineers. Professional status is granted by the Institution of Water Engineers, which issued a report on recruitment and training in 1944, recommending entry to the profession by means of a university or engineering college course, followed by practical training ; for university students and pupils the report recommended a short pre-entry practical training (one year) and a course of practical training at the end of the university course or pupilage, lasting two years ; the water engineer should aim at securing as varied an experience as possible up to the age of 30. Employment is secured with municipal authorities, water companies, consulting engineers and Government departments at home and abroad.

CHAPTER VII

INDUSTRY AND SCIENCE

THE whole system of technical education is under review by the professional bodies, and is receiving much attention from the Government. The 1944 Education Act makes provision for the technical education of young persons up to the age of 18. In 1945 there were over 200 technical colleges in Great Britain, and the number of National Certificates in engineering awarded during 1942-45 was 60 per cent above the pre-war figure. Plans were announced for national technical education in 1945, making provision for all workers from craftsmen to research workers and managers. The Percy Committee on Higher Technological Education, reporting in July 1945, recommended a standing organisation to survey industry and co-ordinate the education of scientists and technologists, and the establishment of a number of "Colleges of Technology." The Scottish Council on Education has recommended the national planning of technical education, and means for increasing the numbers of potential research workers. The Barlow Committee on Scientific Manpower made important recommendations in 1946 for increasing the output of scientific graduates, and for improving research facilities. It was announced in 1946 that the status of technical colleges was to be raised and their influence in the industrial field extended. The major technical colleges will provide for both local and regional needs. Where the demands for courses or advanced instruction are limited, provision will be concentrated on a national basis; in some cases the requisite provision will be made in new or separate institutions, but the Minister of Education has asked authorities to offer accommodation in existing colleges for use as national schools or departments for particular branches of technology. A national council for technology is to be established to co-ordinate the work of the regions and ensure

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that a comprehensive national view is taken, and it will determine whether the technical colleges should award a diploma or degree.

Government appreciation of the importance of research has received practical recognition in the form of increased grants to the universities, and in 1946 the Chancellor of the Exchequer announced new terms of reference to enable the University Grants Committee to play a more positive and influential part in the new phase of rapid expansion and planned development of the universities, which are being pressed to increase the numbers of students by 100 per cent as well as the volume of scientific research. The Government has stated that it is in general agreement with the conclusions of the Barlow Committee's recommendations regarding scientific manpower.

In order to implement these, the Ministry of Labour and National Service in 1947 conducted a survey of scientific and technological manpower, so as to obtain an analysis of the existing scientific and technological manpower in Britain, which will form a basis for estimating the directions in which expansion should take place in universities and technical colleges.

In order to bring about closer links between industry and scientific education, the Ministry of Education in 1946 announced a scheme to encourage more full-time teachers to return to industry, so as to keep in touch with industrial developments and to freshen their industrial and commercial experience ; the scheme allows special leave up to a maximum of six months with full pay and six months without pay. Interchange schemes between industry and university research workers have been adopted by some universities.

Students who continue their full-time education up to the age of 18 may enter a technical college or university for full-time study, or may undertake a sandwich course of periods of technical training alternating with full-time study at a technical college. The university student may receive practical training either before, after, or during the vacations of his university course. Many technical colleges have provision for reading for university degrees, either as full-time or

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part-time study, and details of these should be obtained from local colleges or from education offices. Increasing attention is being paid to the need for technicians and scientists with the best possible training to undertake the direction and development of industry, and many universities have commenced schemes of expansion directed particularly towards increasing facilities for scientific education, while financial assistance is provided for in the Education Act. Graduates with a broad scientific education, together with specialised knowledge of the appropriate branch, may proceed to the highest positions in research, production, planning and other branches of industry, as well as to the research associations, Government departments and university and technical teaching staffs. The Advisory Bureau for Research has formed a department with the object of encouraging advanced study and specialisation, and is prepared to offer guidance to university graduates in undertaking specialist studies.

Many of the professional associations have instituted examinations, or accept equivalent examinations, which qualify students for membership. Corporate membership of these bodies implies a recognised standard of competence, and courses of study leading to the examinations are provided at technical colleges. The organisations are dealt with individually in the appropriate sections of this article.

A white paper (Cmd. 6679), published in 1945, describes the complete reorganisation of the Scientific Civil Service, with increased salary scales and improved openings. The scientific officer class is recruited from highly qualified scientific graduates, on a salary scale comparable with the administrative class. The experimental officer class is recruited partly from science students aged about 18, and partly from university graduates and persons with experience in industry and engineering. Recruitment is centralised in the Civil Service Commissioners.

BIO-CHEMISTRY

The bio-chemist may take an honours degree in bio-chemistry at a university, or an honours degree in chemistry

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with the subsidiary subjects of botany, zoology or physiology, and a post-graduate course in microbiology. An honours degree in chemistry may be accompanied by physics and mathematics as subsidiary subjects, and followed by post-graduate work in a biological science. A period of research is a useful asset.

Openings are to be found in food manufacturing industries, in combines dealing with milk, in firms marketing agricultural fertilisers, insecticides, etc. and in firms manufacturing medicines.

BIOLOGY

Biology, the study of living things, while of increasing importance in the educational field, has fewer openings in industry than chemistry or physics. It is necessary to read for a university degree in botany and zoology, but some knowledge of chemistry and physics is necessary. Openings may be found in fishery research and marine biological investigations, in universities and technical colleges, in agriculture, and with Government departments and firms that are interested in these subjects.

BREWING

Brewing comprises a wide range of subjects. Those who aspire to become Brewers should obtain (a) an approved degree in science, with chemistry as a main subject, followed by a post-graduate course of one year at either the British School of Malting and Brewing (University of Birmingham) or the Heriot-Watt College, Edinburgh; or (b) the Diploma of Brewing of the British School of Malting and Brewing (University of Birmingham) or of the Heriot-Watt College, Edinburgh; or (c) the Associate Membership of the Institute of Brewing. An approved degree in science and the aforesaid diplomas exempt from the Associate Membership examination of the Institute of Brewing.

Amongst the many technical colleges at which some

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portion, at least, of the training for the Associateship Examination may be taken, special mention should be made of the College of Technology, Manchester and the Sir John Cass Technical Institute, London. Full details of training and scholarships may be obtained from the Secretary of the Institute. The Institute offers various classes of membership.

CHEMISTRY

For the chemist, a full-time course leading to a university degree in science, with honours in chemistry, is recommended. Physics and mathematics are recommended as subsidiary subjects to be studied, while a period of post-graduate research is an asset. Part-time study at a technical college may be undertaken by those employed in a laboratory or works, leading either to an external degree or to one of the following qualifications.

The Royal Institute of Chemistry conducts an associate-ship examination. Full details regarding the Institute's grades of membership should be obtained from the Registrar of the Institute. Technical colleges offer three or four years' full-time courses leading to degrees, diplomas and to the Associateship of the Institute. For students who have not reached matriculation or an equivalent standard, part-time courses lead to the National Certificates in chemistry.

Chemists may be employed as lecturers and teachers, as production and research workers in industry and agriculture, as scientists in Government departments and local authorities, and in independent practice. The requirements of industry are for chemists of varied types to undertake work in connection with dyes, textiles, chemicals, paints, rubber, explosives, plastics and, in fact, in practically all industries. Industrial chemists may be employed as analytical chemists, research chemists, control chemists, consulting chemists, and chemical engineers (see appropriate section). Government departments and research associations provide numerous openings. The Royal Institute of Chemistry maintains an appointments register and a list of laboratory assistants, and

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issues a booklet, *The Profession of Chemistry*, containing detailed recommendations as to the education and training of a chemist, with a synopsis of possible careers.

The qualifications of the Royal Institute of Chemistry—the Fellowship (F.R.I.C.) and the Associateship (A.R.I.C.)—are officially recognised by Government and other authorities both at home and in other parts of the British Commonwealth. Chemists who have obtained good honours degrees, or equivalent qualifications, with chemistry as the principal subject, and have received adequate training in certain allied sciences, may be admitted to the Associateship without further examination. Those who have not obtained such qualifications, or who desire to show that they have passed an examination conducted by the Institute itself, with its insistence on a high standard of practical laboratory efficiency, may take the examination for the Associateship. Associates of at least three years' standing may be admitted to the Fellowship, either by taking a further examination in a special branch of chemistry or by submitting the results of work sufficient to justify exemption therefrom.

A public analyst must hold the Diploma of Fellowship or Associateship of the Royal Institute of Chemistry, and the Institute's certificate in the Chemistry (including Microscopy) of Food and Drugs. Appointments are available with local authorities, food manufacturers, Government departments and in private practice.

After obtaining a qualification in chemistry, the student may undertake specialisation, with further study, in such subjects as agricultural chemistry, glass technology, brewing and fermentation, textiles, metallurgy, etc., and may then enter a works appropriate to his training. Laboratory assistants may enter employment at the age of 16 to 18, the general requirements being good general education with special ability in science. Government departments and most laboratories employ junior assistants from the age of 19, of Higher School Certificate or Intermediate B.Sc. standard. These may achieve further advancement if they follow part-time training at technical colleges for external degrees or similar qualifications.

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FUEL TECHNOLOGY

The fuel technologist is concerned with the use of fuel resources for heating, lighting and power, and the work includes production of fuel in the form in which it is to be used, and the efficient and economic use of fuels for providing power and heat. It is a profession which presents an increasing number of opportunities for scientists. Those specialising in coal technology may find employment with industrial firms, industrial research laboratories, electrical undertakings, the Fuel Research Board, the National Coal Board, the Ministry of Fuel and Power, firms of consulting engineers, or in teaching or technical journalism.

University training may consist of a chemical engineering course with post-graduate training in fuels, a mechanical engineering course followed by post-graduate work in fuel chemistry and technology, or a special course in fuel technology. Training for non-university students includes the Ordinary and Higher National Certificates in Mechanical or Electrical Engineering or Chemistry or associate membership of a professional institution.

Those wishing to specialise in oil technology may take a degree course in oil engineering, chemical engineering, pure science followed by two years' post-graduate work in petroleum technology, mechanical engineering followed by post-graduate work in fuel chemistry and technology, or a special course in fuel technology. Non-university training consists in the Ordinary and Higher National Certificates in Mechanical or Electrical Engineering or Chemistry. Professional status is granted by the Institute of Petroleum.

The Regional Joint Education Committee of the Ministry of Fuel and Power and the Institute of Fuel are principally concerned with the development of facilities for training in all grades of fuel technology. Applicants should write to the Secretary of the Regional Joint Education Committee for the region in which he resides, or to the Education Committee of the Institute of Fuel, 18 Devonshire Street, London, W.1. The Institute conducts qualifying examinations for associate membership.

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GLASS TECHNOLOGY

Training in glass technology consists in (a) Honours degree course leading to B.Sc. Tech. in Glass Technology; (b) Pass degree of B.Sc. Tech.; (c) Diploma in Glass Technology. These are available at the University of Sheffield, which also provides courses for post-graduate research and special summer courses. Local centre courses are conducted in the glass industry centres. Appointments may be obtained in factories or in research.

HOROLOGY

The horological industry, now being revived in Britain, is the first for which the Ministry of Education has established a National College—at the Northampton Polytechnic, London, E.C.1, to teach the subjects of horology and instrument technology.

The British Horological Institute has been responsible for promoting the development of technical training for craftsmen, and is the recognised examining body for the award of certificates in horological subjects. The Institute conducts correspondence courses in horological technology, and maintains an employment bureau. Details may be obtained from the Secretary, 35 Northampton Square, London, E.C.1. Specialist courses are conducted by firms concerned with this branch of industry, and by technical schools.

There is a three-year general course for students aged over 16, who have attained a School Certificate standard of education, or who have completed a Technical Secondary School Course. A two-year advanced course is designed for students over 19 years who have obtained a National Certificate or Diploma in Engineering or its equivalent.

INDUSTRIAL ART AND DESIGN

In the past openings for the designer in industry have been limited, but there will probably be increasing opportunities in the future. The growing appreciation of the

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value of good design has found expression in the establishment of the Council of Industrial Design, to assist industry to improve the design of machine-made goods. One of its objects is to set up design centres for trades to which they can be of use.

A student may generally specialise at an art school in a particular branch of design for which he has special aptitude. The following training courses are available: Ministry of Education Art Teachers' Diploma, including a National Diploma Examination in Design; Associateship of the Royal College of Art, South Kensington, London (candidates complete a three years' training in a recognised art school); London University Diploma in Fine Art; B.A. Degree in Fine Art (Durham [Newcastle Division] and Reading); Diploma of the Colleges or Schools of Art in Scotland (Aberdeen, Dundee, Edinburgh, Glasgow). The trained designer may practise as a consultant, or as a specialist in one industry.

The Scottish Advisory Council has recommended the establishment of a central college in Scotland for the further training of post-graduate students in industrial design.

The Council of the Society of Industrial Artists published a Report (1944) on the education and status of the designer in industry, and recommended the establishment of a preliminary basic course standard in all approved local art schools, of specialist courses in regional colleges for completing the training of designers for employment in any one industry, and of an advanced course in a central college for completing the training of independent practitioners or consultants. Diplomas would be granted by a Board of Industrial Design Education. The specialist course would last for three years, and the non-specialist consultant course would extend to four years. Refresher courses and post-graduate travelling fellowships are also recommended.

The proposed Glass Design Research Department at the Edinburgh College of Art is intended to serve the whole glass industry in the United Kingdom. The courses, designed for post-graduate students and industrial craftsmen, will bridge the gap between student training and full industrial

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experience, and will also provide refresher courses for members of the industry.

The National Register of Industrial Art Designers, established in 1937 by the Board of Trade, maintains a register of qualified designers for industry, and brings registered designers into touch with manufacturers and others seeking their services

In 1936 the Council of the Royal Society of Arts, with a view to enhancing the status of industrial designers, instituted the distinction of Royal Designers for Industry. This distinction, "R.D.I.", equivalent in the realm of industrial design to "R.A." in the realm of the Fine Arts, is conferred on British designers "who have attained high eminence and efficiency in creative design for industry." The number of persons who may hold the distinction at any one time is limited to 40.

The Central Institute of Art and Design, London, conducts design refresher courses in co-operation with the Council of Industrial Design.

The Council of Industrial Design, in its report for 1946-47, records that some agreement has been reached with the Ministry of Education regarding the training of designers. The training committee of the Council aims at the addition of design endorsements to national certificates in engineering.

ADVERTISING

Entry to advertising may be made by men with commercial experience, or by youths who follow a subsequent course of practical training within the advertising department of a firm or with an advertising agency. Courses in advertising and art are provided at commercial and technical institutions.

Examinations are conducted by and details may be obtained from The Advertising Association, Ludgate House, 110-111 Fleet Street, London, E.C.4, and The Institute of Incorporated Practitioners in Advertising, 48 Russell Square, London, W.C.1.

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METALLURGY

Metallurgy deals with the application of the principles of chemistry and physics to metals and metallic processes. It covers the extraction of ores, their nature, properties, and behaviour, and the fabrication of metals. The two main branches of the profession are extraction metallurgy, covering all activities up to the production of the ingot or an equivalent stage, and physical metallurgy which deals with the study and treatment of metals after they have been produced in ingot or other form.

The Iron and Steel Institute, in its report on the Training of Metallurgists, describes the present great need for "men skilled in the science of metallurgy" and "knowledgeable in the art of working metals", to undertake research and development of the metallurgical industry, to fill responsible positions in production, and to be employed in the various metal industries and in teaching. This report recommends the acquisition of a university degree, with works experience both before and during training. The course should include the study of basic scientific subjects, followed by specialisation in metallurgy. Thus a graduate in physics or chemistry should take a two years' post-graduate study of metallurgy. With reference to non-university training, the report states that there should be more extensive part-time facilities and its recommendation for the creation of a National Certificate in Metallurgy has been implemented.

Scope for metallurgists is to be found in the iron and steel works, in iron foundries, in the brass and copper trades, and in aluminium, nickel, zinc, tin and other light metals industries, as well as in specialised trades such as electric lamp and radio valve works, and in scientific instrument works.

The Councils of the Iron and Steel Institute and of the Institute of Metals have assisted in the establishment of the Institution of Metallurgists, which is a qualifying body, membership of which is dependent on evidence of suitable qualifications or on passing an examination. Information may be obtained from the Secretary, Institution of Metal-

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lurgists, 4 Grosvenor Gardens, London, S.W.1. The Institution also established an appointments register in January 1947, and inquiries should be sent to the Registrar, Appointments Register, at the above address.

A Joint Committee on Metallurgical Education has been formed by the Iron and Steel Institute, the Institution of Mining and Metallurgy, the Institute of British Foundrymen, the Institute of Metals and the Institution of Metallurgists, with the objects of co-ordinating the views of the Institutes and advising their Councils on the training of metallurgists and encouraging the extension of liaison between the universities, the metallurgical industries and the technical colleges. Further information and copies of its brochure, *Metallurgy—A Scientific Career in Industry*, can be obtained from the Secretary, 4 Grosvenor Gardens, London, S.W.1.

Particulars of the National Certificates in Metallurgy can be obtained from the Secretary, Joint Committee for National Certificates in Metallurgy, 4 Grosvenor Gardens, London, S.W.1.

The Institution of Mining and Metallurgy is a qualifying institution in respect of metals other than iron, and having a special reference to extraction processes up to and including the refining of metals. Information may be obtained from the Secretary, Salisbury House, Finsbury Circus, London, E.C.2.

The Institute of Welding offers various grades of membership.

The British Cast Iron Research Association is keenly interested in staff training and in releasing to industry both graduate and non-graduate staff suitable for technical and executive control. Young non-graduates are employed as laboratory assistants while training; they are expected to acquire a professional qualification by part-time study. Young men are also sent by members for training for a short or long period. The British Foundry School, which was founded on the initiative of the Association in 1935, closed at the outbreak of the war, but is reopening. Approximately a hundred men holding responsible positions in the industry have been students of the School, ex-members of the British

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Cast Iron Research Association staff, or nominees of members trained by the Association. The Council envisages arrangements whereby regular movement of staff into industry and from industry to the Association will take place, together with an extension of the above-mentioned plans for training staff and representatives from industry.

The Institute of British Foundrymen has taken an active part in the provision of foundry technical education and has been instrumental in the establishment of classes at technical colleges in a large number of centres throughout the country. The Institute has also been instrumental in establishing the City and Guilds of London Institute examinations in Foundry Practice and Pattern-making, and endorses Ordinary and Higher National Certificates in Mechanical Engineering in respect of foundry subjects. It also endorses Higher National Certificates in Metallurgy in respect of those subjects.

A National Foundry College has been established at the Wolverhampton and Staffordshire Technical College, Wulfruna Street, Wolverhampton, to provide for technical education and research in connection with the Foundry Industry (Ferrous and Non-Ferrous).

OIL AND COLOUR CHEMISTRY

The Oil and Colour Chemists' Association, 7 Whiteheads Grove, London, S.W.3, has issued two reports* on technical education, in which recommendations are made to help the industry to attain a higher technical standard, to raise the status of chemists, to give guidance to the student, and to assist young chemists to continue their studies. The recommendations include an apprenticeship scheme for boys and girls who enter the industry at the age of 14 to 18, who should choose a works or laboratory apprenticeship.

The Association gives courses of post-graduate lectures.

* *First Report on Technical Education*, 1943.

Second Report on Technical Education : The Apprenticeship Scheme, 1944.

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PATENT AGENTS

The majority of those entering this profession have university degrees in science or engineering, or equivalent professional qualifications. The Intermediate examination of the Chartered Institute of Patent Agents is then taken after one year of service, and the Final after three years of service with a patent agent. The Register of Patent Agents bears only about 400 names and the annual entry was about 15 to 20 before the war.

In addition to qualified patent agents, there are technical assistants, who may later qualify as patent agents, and who have some qualification in engineering, physics or chemistry. Those who pass the final examination of the Institute are eligible for election to fellowship, and those who pass the intermediate examination are eligible for election to associate-ship.

Full details may be obtained from the Secretary, Chartered Institute of Patent Agents, Staple Inn Buildings, London, W.C.1.

PHYSICS

A university training is desirable for a physicist, but it may in some cases be taken on a part-time basis at a technical college by a student who may work as a laboratory assistant. A period of post-graduate research is a useful adjunct. Full professional status may also be reached by following a three-year part-time course at a recognised technical college for the Ordinary, and a further two years' course for the Higher National Certificates in Applied Physics.

The Institute of Physics recommends that a student should follow a general university course in science before entering an honours school of physics, and that mathematics should be one of at least two other scientific subjects which should be studied. Those proposing to enter industry or Government service might take a course in the technique of physics applied to engineering or other industries, or a course in some technological subject, such as physical metallurgy or glass technology. An intending research physicist will

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need experience in research at a university, industrial establishment or some other centre, usually leading to a higher degree. The Institute also recommends, in its pamphlet *The Education and Training of Physicists* (1943) that the Ministry of Education should make available short advanced courses in both theoretical and experimental physics, suitable for men and women in industry or Government service. It considers that it should not be a primary function of technical colleges to educate students for external university degrees, while facilities for obtaining education at technical schools followed by advanced courses (full-time, sandwich and part-time) at technical colleges should be extended. Courses should be given in branches of technical physics on the lines of those provided for the National Certificates and Diplomas, while students at technical colleges should be enabled to obtain a recognised professional qualification in physics. Students in physics should have more direct contacts with industry. The National Certificate in Applied Physics meets some of these recommendations.

The Institute of Physics offers qualified membership to those with the necessary qualifications. The Institute also maintains an appointments register, open to fellows, associates, students and prospective employers, as well as an advisory service for members and students. It also issues a Laboratory Arts Certificate to laboratory and technical assistants in physics and practical mathematics, simple wood and metal work, glass blowing, and laboratory organisation and technique. Details of these services may be obtained from the Secretary at the Institute.

The newly qualified physicist usually begins his career as an assistant in a works laboratory or in a development or research laboratory, and may ultimately proceed to a more responsible post. In a university he may begin as a demonstrator or junior lecturer. In the D.S.I.R. and other Government departments, or in research association laboratories he may begin as a junior scientific officer. There are also openings as meteorologists at the Air Ministry, in Colonial Service, as teachers, in the x-ray and radium departments of hospitals and in research laboratories.

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Institutions such as Faraday House and some of the polytechnics provide full-time training in physics as applied to electrical and radio engineering, while laboratory experience and education on commercial apparatus is provided at the Marconi School, which accepts students from outside the firm.

The engineering applications of x -rays are divided into two main groups, according to the technique employed, namely radiography and x -ray crystal analysis. As a background to training in industrial radiography, some knowledge of science, particularly physics, up to at least matriculation standard, is desirable. During the war, however, training methods have made it possible to train intelligent students who lack that background. Courses of specialised training for industrial radiographers are held at the Kodak School of Industrial and Engineering Radiography and these are designed to conform to the requirements of the authorities controlling radiological inspection. A course in the application of x -ray crystal analysis to industrial problems is also arranged from time to time, but it is stressed that most industrial x -ray crystal analysis is undertaken by physicists with research experience. Inquiries should be addressed to the Kodak School of Industrial and Engineering Radiography, Kodak Limited, Wealdstone, Harrow, Middlesex.

PLASTICS

The plastics industry, which is par excellence the product of modern scientific research, requires a wide range of qualifications in its personnel, including chemists, physicists and engineers, as well as craftsmen, administrators and designers.

The Institute of the Plastics Industry has launched a scheme to provide means to implement its education programme, the fund being administered by the Joint Executive Committee composed of members of the British Plastics Federation and the Institute of the Plastics Industry. Details of the Institute's membership grades appear in Appendix G. The Institute awards a diploma to the student of 16 years of age who has passed the City and Guilds of London Institute

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examinations in Plastics, stages I and II, and has attended a prescribed course of study.

The scheme of training for pupil apprentices developed by the Institute provides a systematic course of practical training in a works, supplemented by appropriate technical training, to equip youths entering the industry to become fully trained and to proceed to the higher positions in the industry. Names of firms with training facilities may be obtained from the Secretary of the Joint Executive Committee at the Institute of the Plastics Industry. A longer apprenticeship is arranged for boys of a lower educational standard, leading to certificates.

RUBBER TECHNOLOGY

The Institution of the Rubber Industry offers qualifying membership to chemists, physicists, and engineers in the rubber industry. Training for the diplomas granted by the Institution can be carried out by full-time study at one of the recognised rubber trade schools situated in London, Manchester and Glasgow, or by part-time study under the guidance of a Fellow of the Institution. A scheme to assist part-time and full-time students with the cost of their studies has recently been established, and full-time scholarships leading to the Associateship, tenable at the Northern Polytechnic, Holloway, London, are now being offered annually to suitable candidates.

TEXTILE TECHNOLOGY

A university degree in textile technology may be taken at the universities located in the textile manufacturing regions. The Textile Institute is the recognised professional body of the textile industry. Members may take an examination to qualify for associateship, and the Institute is empowered to grant certificates of competency in the practice, teaching or profession of textile technology. Associates and Fellows may style themselves "Textile Technologists". Full details may be obtained from the Secretary of the Institute.

Technical colleges and schools in the textile manufacturing

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regions specialise in the various branches related to the types of manufacture undertaken in the district, and information should be sought from local colleges and education authorities. Furthermore, various branches of chemistry and engineering are closely related to the textile industry. Openings in textile technology include posts as industrial controllers, inside managers, textile designers, merchants, and research workers in universities, industry and the research associations.

The Textile Institute co-operates with the Ministry of Education on matters connected with technical training for textiles, and is jointly responsible, with the Ministry, for National and Higher National Certificates in Textiles. The Institute also awards scholarships, studentships and research grants, and organises annual competitions for design.

As soon as circumstances permit the British Cotton Industry Research Association is to offer a number of Shirley Scholarships for the training of young men for managerial positions in the industry. The "Trainee year" will have fixed dates of commencement and termination with a fixed course of lectures, demonstrations and laboratory work. Members of the Institute staff have been prominent as lecturers at Textile Society meetings and a successful experiment has latterly been tried of giving a series of special lectures to the technical staffs of member firms in the various textile districts. It is intended to develop this scheme and thus broaden the bridge between the Institute and the industry. It is also intended to strengthen the links between the Institute and the academic world by the offer of a number of external Shirley Fellowships.

CHAPTER VIII

HEALTH SERVICES

MEDICINE

THE registrable qualification to practise medicine is either a bachelor degree in medicine and surgery, taken together at a university, or a diploma issued by one of the licensing corporations. Before commencing a course of medical study, a student must have passed a recognised preliminary examination in general education, normally of university matriculation or entrance standard in arts or pure science. The General Medical Council also requires an additional examination in chemistry, physics and one or two other subjects of general education; this may be taken before or after entry to the university, but professional study cannot begin until the examination has been passed. A student must register with the university school of medicine, and/or with the examining body for whose qualification he is to read.

The total length of the course at the university may not be less than five years, while in many cases it lasts up to six years, and a medical degree combined with another degree may take seven or eight years. Part of the course includes clinical study which may be undertaken at certain recognised public hospitals or dispensaries. In some cases it is possible to take a Bachelor of Science degree concurrently. When the final examination has been passed, the student registers with the General Medical Council, which keeps the Medical Register of "legally and duly qualified medical practitioners."

The qualified practitioner may enter general practice, but is advised to have practical experience in a hospital before doing so. Careers in the public service include appointments in hospitals, central Government departments, local government, Colonial governments, and H.M. Forces, offering scope for practice, research and administration; the public services

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will absorb an increasing number of doctors when the Government's National Health policy is implemented.

Research appointments may be secured under the Medical Research Council, the Lister Institute, and the universities. Post-graduate diplomas are issued by the universities, the Royal Colleges and other bodies, after further study and examination, for those who wish to become specialists or consultants, to undertake research, or to enter some special branch of medicine such as public health or industrial medicine. Information may be obtained from the Dean, British Post-Graduate Medical School, Ducane Road, Shepherd's Bush, London, W.12, and from the Secretary, the Medical Research Council, 38 Queen Street, London, S.W.1.

Particulars of entry to health services abroad may be obtained from the Director of Recruitment (Colonial Service), Colonial Office, 2 Park Street, London, W.1; the Medical Adviser, India Office, London, S.W.1; the Secretary, Military Department, India Office, 4 Central Buildings, London, S.W.1; the High Commissioner for Southern Rhodesia, Rhodesia House, 429 Strand, London, W.C.2; and the Consulting Physician to the Sudan Government, 93 Harley Street, London, W.1.

A scheme of post-graduate training for medical officers released from the Forces has been prepared by the Health Departments, universities and other bodies concerned. The scheme includes resident salaried posts for up to six months at teaching hospitals, or other hospitals approved by the universities, for those who joined the Forces within a year or so of obtaining a medical qualification; refresher courses at approved hospitals for those who had become established in general practice before joining the Forces; and posts of the "registrar" type in teaching and other hospitals approved by the universities for those who were trained for a specialist career when they joined the Forces or are accepted as suitable for such training on release. The Addresses to which medical officers should apply for information may be obtained from the Ministry of Health, Whitehall, London, S.W.1, or from the Department of Health for Scotland, St. Andrew's House, Edinburgh.

HEALTH SERVICES

UNIVERSITY COURSES IN MEDICINE

<i>University</i>	<i>Courses</i>
Birmingham	M.B., Ch.B. (6 years); M.D.; Ch.M.; Ph.D.; M.D. (State Medicine); D.P.H.; C.P.H.
Bristol	M.B., Ch.B. (5 years); Ch.M.; M.D.; Ph.D.; D.P.H.; D.P.M.; D.M.R.; Testamur in Applied Bacteriology.
Cambridge	M.B., B.Chir. (6 years); M.D.; M.Chir.
Durham (King's College, Newcastle-on-Tyne)	M.B., B.S. (5 years); M.D.; M.S.; D.Ch.; B.Hy.; D.P.H.; D.Hy.; D.Psy.; Ph.D.; M.B., B.S., B.D.S. combined (7 years).
Leeds	M.B., Ch.B. (5½ years); B.Sc.; M.D.; Ch.M.; Ph.D.; D.P.H.; D.P.M.; Diploma in Dietetics.
Liverpool	M.B., Ch.B. (6 years); M.D.; Ch.M.; M.Ch.Orth.; Ph.D.; D.P.H.; V.D. Pathologist Certificate; D.T.M. & H.; M.Rad.
London	M.B., B.S. (5½ years); M.D.; M.S.; Ph.D.; D.C.P.; D.M.R.; D.P.M.; D.P.H.; Diploma in Bacteriology; Diploma in Dietetics; Clinical courses for students of Oxford and Cambridge.
	at Charing Cross Hospital Medical School, 62 Chandos Place, W.C.2.
	Guy's Hospital Medical School, London Bridge, S.E.1.
	King's College, Strand, W.C.2.
	King's College Hospital Medical School, Denmark Hill, S.E.5.
	London Hospital Medical College, Turner Street, E.1.
	London (Royal Free Hospital) School of Medicine for Women, Hunter Street, Brunswick Square, W.C.1.
	Middlesex Hospital Medical School, W.1.
	Queen Mary College, E.1.
	St. Bartholomew's Hospital Medical College, E.C.1.
	St. George's Hospital Medical School, S.W.1.
	St. Mary's Hospital Medical School, W.2.
	St. Thomas's Hospital Medical School, S.E.1.
	University College, Gower Street, W.1.
	University College Hospital Medical School, W.C.1.
	Westminster Hospital Medical School, S.W.1. (also externally).
Manchester	M.B., Ch.B. (5½ years); M.D.; Ch.M. M.Sc.; D.P.M.; D.P.H.; Certificate in Venereal Diseases; Diploma in Bacteriology.
Oxford	B.A. must be obtained first; M.B., B.Ch.; D.M.; M.Ch.; D.O.

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<i>University</i>	<i>Courses</i>
Sheffield	M.B., Ch.B. (5½ years); Ch.M.; M.D.
Wales	M.B., B.Ch. (5½–6 years); D.P.H.; T.D.D. (University College of South Wales and Monmouthshire, Cardiff; Welsh National School of Medicine, Cardiff).
Aberdeen	M.B., Ch.B. (5 years and 2 terms); M.D.; Ch.M.; Ph.D.; D.P.H.
Edinburgh	M.B., Ch.B. (5 years); M.D.; Ch.M.; B.Sc. or M.A., M.B., Ch.B. combined (7 years); M.B., Ch.B., and any 2 other degrees (8 years); D.M.R.; D.P.H.; D.T.M. & H.; D.T.V.M.
Glasgow	M.B., Ch.B. (6 years); M.D.; Ch.M.; D.P.H.; B.Sc. in Public Health.
St. Andrews	M.B., Ch.B. (5 years); M.D.; Ch.M.; B.Sc.; M.B., Ch.B. combined; D.P.H.; D.P.D.
Belfast	M.B., B.Ch., B.A.O. (6 years); M.D.; M.Ch.; M.A.O.; D.P.H.; D.P.M.

NON-UNIVERSITY MEDICAL SCHOOLS :

- West London Hospital Medical School, Woverton Gardens, Hammersmith, W.6.;
- Anderson College of Medicine, Glasgow; St. Mungo's College, Glasgow;
- School of Medicine of the Royal Colleges of Edinburgh, Surgeons' Hall, Edinburgh.

LICENSING BODIES AND EXAMINATION BOARDS FOR THE CONDUCT OF EXAMINATIONS :

The UNIVERSITIES listed above ;

THE EXAMINING BOARD IN ENGLAND, 8–11 Queen Square, London, W.C.1.

(Formed by the Royal College of Physicians of London and the Royal College of Surgeons of England).

L.R.C.P.(Lond.), M.R.C.S.(Eng.); the double qualification gives admission to the Medical Register.

Post-graduate Diplomas: D.P.H.; D.T.M. & H.; D.O.M.S.; D.P.M.; D.L.O.; D.M.R.D.; D.M.R.T.; D.A.; D.C.H.; D.Phys.Med.; D.I.H.

SCOTTISH CONJOINT BOARD, 18 Nicolson Street, Edinburgh, 8.

(Formed by the Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow.)

HEALTH SERVICES

L.R.C.P.(Edin.), L.R.C.S.(Edin.), L.R.F.P. & S.(Glas.); the triple qualification gives admission to the Medical Register.

Post-graduate diplomas; D.P.H.

SOCIETY OF APOTHECARIES, Black Friars Lane, London, E.C.4.

Diploma in Medicine, Surgery and Midwifery (L.M.S.S.A. Lond.)

Post-graduate Diploma in Obstetrics and Gynaecology (M.M.S.A.).

Post-graduate Diploma in Industrial Health (D.I.H.).

POST-GRADUATE DIPLOMAS ISSUED BY THE ROYAL COLLEGES:

Royal College of Physicians: M.R.C.P.;

Royal College of Surgeons: F.R.C.S.;

Royal College of Obstetricians and Gynaecologists: F.R.C.O.G., M.R.C.O.G., D.R.C.O.G.;

Royal College of Physicians of Edinburgh: F.R.C.P.(Edin.);

Royal College of Surgeons of Edinburgh: F.R.C.S.(Edin.);

Royal Faculty of Physicians and Surgeons of Glasgow: F.R.F.P.S. (Glas.).

M.B., B.M., Bachelor of Medicine; Ch.B., B.S., B.Chir., B.Ch., Bachelor of Surgery; B.Sc., Bachelor of Science; B.A., Bachelor of Arts; M.D., D.M., Doctor of Medicine; M.S., Ch.M., M.Chir., M.Ch., Master of Surgery; M.Sc., Master of Science; D.Ch., Doctor of Surgery; B.Hy., Bachelor of Hygiene; D.Hy., Doctor of Hygiene; B.A.O., Bachelor of Obstetrics; M.A.O., Master of Obstetrics; M.Ch.Orth., Master of Orthopaedic Surgery; B.D.S., Bachelor of Dental Surgery; Ph.D., Doctor of Philosophy; D.A., Diploma in Anaesthetics; D.C.H., Diploma in Child Health; D.C.P., Diploma in Clinical Pathology; D.L.O., Diploma in Laryngology and Otolaryngology; D.M.R.(E.), Diploma in Medical Radiology (and Electroradiology); D.O., Diploma in Ophthalmology; D.O.M.S., Diploma in Ophthalmic Medicine and Surgery; D.P.D., Diploma in Public Dentistry; D.P.H., Diploma in Public Health; D.P.M., Diploma in Psychological Medicine; D.Psy., Diploma in Psychiatry; D.T.M., Diploma in Tropical Medicine; D.T.H., Diploma in Tropical Hygiene; D.T.V.M., Diploma in Tropical Veterinary Medicine; T.D.D., Tuberculous Diseases Diploma.

DENTISTRY

The Dental Board of the United Kingdom is responsible for the registration of dentists who gain the qualifications recognised by the General Medical Council. The qualification for registration is either the L.D.S. or the B.D.S. Students must register at the school of dentistry to which they desire to be admitted, under the same conditions as for medical students. The educational standard required for entry to

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the L.D.S. is generally rather lower than for the degree. Professional study may be commenced either at a recognised dental hospital or school, or as a pupil of a registered dental practitioner.

Higher diplomas are available for those wishing to equip themselves for higher posts and for research.

Careers may be followed in private practice, under local authorities, with industrial firms or in H.M. Forces.

The Teviot Committee on Dentistry, in its Final Report (Cmd. 6727) recommends that there should be an entry of 900 students a year, which will necessitate an increased provision of facilities for teaching. Recommendations are made for the financial assistance of students, and for more dental research. The Report also deals with the craft of dental mechanics, which should be entered *via* apprenticeship concurrently with part-time technical and scientific instruction, and with the occupation of dental attendants, who should be instructed by dental hospitals and other institutions and granted certificates of proficiency.

UNIVERSITY SCHOOLS OF DENTISTRY :

<i>University</i>	<i>Courses</i>
Birmingham	L.D.S. (4 years) ; B.D.S. (5 years) ; M.D.S.
Bristol	L.D.S. (4 years) ; B.D.S. (4½ years) ; M.D.S.
Durham (King's College, Newcastle-on-Tyne)	L.D.S. (4 years) ; B.D.S. (5 years) ; M.B., B.S., B.D.S. combined (7 years) ; M.D.S.
Leeds	L.D.S. (4 years) ; B.Ch.D. (5 years) ; M.Ch.D.
Liverpool	L.D.S. (4 years) ; B.D.S. (5 years) ; M.D.S.
London	L.D.S. (4 years) ; B.D.S. (4 years) ; M.S. (Dent.) ; L.R.C.P.(Lond.) , M.R.C.S.(Eng.) , L.D.S. , R.C.S.(Eng.) , combined (7 years).
at Guy's Hospital Dental School, London Bridge, S.E.1.	
King's College Hospital Medical School, Denmark Hill, S.E.5.	
London Hospital Medical College, Turner Street, E.1.	
University College Hospital Medical School, W.C.1.	
Royal Dental Hospital School of Dental Surgery, W.C.2. (also externally).	
Manchester	L.D.S. (4 years) ; B.D.S. (4 years) ; M.D.S. ; D.D.S.
Sheffield	L.D.S. (4 years) ; B.D.S. (5½ years) ; M.D.S.
St. Andrews (Dental School, Dundee)	L.D.S. (4 years) ; B.D.S. (5 years) ; M.D.S. ; D.P.D. ; M.B., Ch.B., B.D.S. or L.D.S. and D.P.D. combined.

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<i>University</i>	<i>Courses</i>
Belfast	L.D.S. (4 years) ; B.D.S. (5 years) ; M.D.S.
Edinburgh	L.D.S. (4 years) ; B.D.S. (5 years).
Glasgow	B.D.S. (5 years).

NON-UNIVERSITY DENTAL SCHOOLS :

Glasgow Dental Hospital and School, 211 Renfrew Street, Glasgow, C.3.

LICENSING BODIES UNDER THE DENTISTS ACT 1878 :

University Authorities listed above.

The Royal College of Surgeons of Edinburgh, 18 Nicholson Street, Edinburgh, 8. (L.D.S., F.R.C.S.(Edin.)).

Royal Faculty of Physicians and Surgeons of Glasgow, 242 St. Vincent Street, Glasgow, C.2. (L.D.S., R.F.P.S.(Glas.)).

Royal College of Surgeons of England, 8 Queen Square, London, W.C.1. (L.D.S., R.C.S.(Eng.)).

L.D.S. ; Licence in Dental Surgery.

B.D.S., or B.Ch.D. : Bachelor of Dental Surgery.

M.D.S., or M.Ch.D. : Master of Dental Surgery.

Ph.D. : Doctor of Philosophy.

D.D.S. : Doctor of Dental Surgery.

D.P.D. : Diploma in Public Dentistry.

L.D.S., R.C.S.(Eng.) : Licence in Dental Surgery of the Royal College of Surgeons of England.

L.D.S., F.R.C.S.(Edin.) : Licence in Dental Surgery of the Royal College of Surgeons of Edinburgh.

L.D.S., R.F.P.S.(Glas.) : Licence in Dental Surgery of the Royal Faculty of Physicians and Surgeons of Glasgow.

NURSING, MIDWIFERY AND HEALTH VISITING

NURSING :

The training of Student Nurses is conducted in hospitals approved as Training Schools. The training is prescribed by the General Nursing Council for England and Wales (23 Portland Place, London, W.1) ; the General Nursing Council for Scotland (5 Darnaway Street, Edinburgh, 3) ; and the Joint Nursing and Midwives' Council for Northern Ireland, in accordance with the provisions of the Nurses Registration Acts of the respective countries, which Acts are administered by the Councils.

The minimum period of training in a hospital approved as a Complete Training School is of three years' duration, except in the case of fever training which is of two years'

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duration. On completion of training and having passed the examinations of the appropriate Council the nurse's name is entered upon the Register of Nurses maintained by that Council. The Register is composed of the following parts : General Part ; Part for Male Nurses (general trained) ; Part for Mental Nurses (which includes a section for Nurses for Mental Defectives) ; Part for Sick Children's Nurses ; Part for Fever Nurses.

The training of pupil Assistant Nurses is provided for in the Nurses Act 1943, and is conducted in hospitals and institutions approved for the purposes of such training by the General Nursing Council for England and Wales, or by the General Nursing Council for Scotland. The training, which is essentially practical in nature, is of two years' duration. On completion of the course and having passed a test, at which the candidate's work throughout her training is taken into account, the Assistant Nurse's name is placed on the Roll of Assistant Nurses maintained by the appropriate General Nursing Council.

The Royal College of Nursing maintains a Department of Education to provide post-certificate lectures and courses of study in every branch of nursing, to improve methods of teaching and to educate leaders for posts of responsibility. The College works in close co-operation with the leading schools of nursing and with the universities. The following whole-time courses are offered : Nursing Administration and Industrial Nursing preparing for the certificates of the College ; Dietitians preparing for the Diploma of the College ; Sister Tutors preparing for the Diploma of the University of London ; and Health Visitors preparing for the certificate of the Royal Sanitary Institute. The following part-time courses are also offered. Teaching of Parentcraft and Venereal Diseases in preparation for the certificates of the College, and lectures in preparation for the Diploma in Nursing of the University of London.

Diplomas in Nursing are granted by the universities of Birmingham, London and Leeds ; Edinburgh and Manchester universities have established courses for sister tutors.

The Tuberculosis Association offers a Certificate for

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Tuberculosis Nursing, after a period of training of two years. State-registered nurses can qualify for the Certificate in one year.

The orthopaedic nurse may, in addition to State registration, take the Certificate of the Central Council for the Care of Cripples, which is also open to physiotherapists.

Special training for industrial nursing is not insisted upon, but a short intensive course of instruction in industrial health for nurses under the age of 27 is being sponsored by the Minister of Health. Special courses are also arranged by the Royal College of Nursing and the Birmingham Accident and Rehabilitation Centre. These last from three to twelve months.

The Government has recommended wider employment of men as nurses and assistant nurses in hospitals, sanatoria and similar institutions, in addition to mental hospitals, where male nurses are most frequently employed. It has also suggested the establishment, with the approval of the General Nursing Council, of a training school for male pupil assistant nurses in specified hospitals and one for male nurses to train for the Tuberculosis Association Certificate examination. Measures announced in January 1946 to help men to take up nursing as a career, include reduction in the period of training for those with suitable war hospital experience, and financial assistance towards the cost of training. Those still in the Forces should apply through the Services, and those demobilised should obtain information from the Health Departments. A one-year course of training leads to State registration for ex-service nursing orderlies.

In September 1945 the Minister of Health announced a scheme for giving financial assistance to State-registered nurses who wish to train as sister tutors or male tutors. Information may be obtained from the Secretary, Ministry of Health, Division 3c, Whitehall, S.W.1.

Pre-nursing courses are being established by some education committees, lasting three years for girls between 14½ and 15 years of age, and one year for girls of 17 years.

A nursing recruitment service has operated in England since 1940, under the King Edward's Hospital Fund. A

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similar scheme was announced for Scotland in January 1946, to advise on opportunities in the profession and on suitable courses of training. It is under the responsibility of the Nuffield Provincial Hospitals Trust.

Qualified State-registered nurses may find employment in hospitals, beginning as staff nurses and being eligible for promotion to be assistant matron or matron. They may also enter hospitals under the Prison Nursing Service or the Ministry of Pensions Nursing Service.

District nursing sisters, employed by local nursing associations, are required to be general State-registered. Special training is given by the Queen's Institute of District Nursing, 57 Lower Belgrave Street, London, S.W.1.

A nurse may also undertake private work, as an independent worker, a salaried nurse attached to an institution, a member of a Nurses' Co-operation, or as a visiting nurse. Many authorities have introduced schemes for part-time employment of nurses and orderlies.

The Ministry of Health is considering the provision of a single national qualification for home nurses.

Appointments of State-registered nurses are made to the defence services, *i.e.* to the Queen Alexandra's Royal Naval Nursing Service, Queen Alexandra's Imperial Military Nursing Service, and the Princess Mary's Royal Air Force Nursing Service. Details may be obtained from each of these bodies.

Those appointed to the Colonial nursing services will be partly engaged in training locally recruited nurses. General State registration qualifications are necessary, with additional midwifery qualifications if possible, while other specialist qualifications are an asset.

Recommendations for improving the Colonial nursing service training were made in 1945.

It was announced in June 1945 that the Civil Nursing Reserve, which was established in 1939, would remain in being for the present, but with improved conditions of service. The hours of work and salaries and other conditions for all nurses have recently been regulated and improved, following the recommendations of the two Rushcliffe Committees and the Taylor Committee.

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Further information on training centres for nursing may be obtained from the local Juvenile Advisory Committee of the Ministry of Labour and National Service or of the local education authority, the Nursing Recruitment Centre (21 Cavendish Square, London, W.1), the Nursing Recruitment Advisory Service for Scotland, 2 St. Andrew Square, Edinburgh, 2, a Resettlement Advice Office of the Ministry of Labour and National Service, or from one of the Nursing Appointments Offices of the Ministry of Labour and National Service listed below :

LONDON : Spencer House, 27 St. James's Place, S.W.1 ; ABERDEEN : 6 Queens Gate ; BIRMINGHAM : 236-9 Broad Street ; BRIGHTON : 3 Lansdowne Road, Hove ; BRADFORD : Britannia House, Broadway, Leeds Road ; BRISTOL : 46 Pembroke Road, Clifton ; CAMBRIDGE : 16 Station Road ; CARDIFF : 8 Cathedral Road ; COLCHESTER : 31 St. John Street ; COVENTRY : 12, Manor Road ; DUNDEE : 30 Meadowside ; EDINBURGH : 5, Rothesay Terrace ; GLASGOW : 450 Sauchiehall Street ; HULL : Mail Buildings, Jamieson Street ; LEEDS : Lloyds Bank Chambers, Vicar Lane, and 15-19 The Headrow ; LEICESTER : 10 Salisbury Road ; LIVERPOOL : Cotton Exchange, Bixteth Street ; MANCHESTER : Royal Exchange Buildings, Bank Street, St. Anne's Square ; NEWCASTLE-ON-TYNE : 153 Barras Bridge ; NORWICH : 5 Queen Street ; NOTTINGHAM : Commerce Chambers, Upper Parliament Street ; OXFORD : Exeter College, Annexe, Turl Street ; PLYMOUTH : 1 Thorn Hill Road, Mannamead ; PRESTON : 9 West Cliffe Terrace ; READING : 23 Valpy Street, and Oxford Street Chambers, Oxford Road ; SHEFFIELD : The White Building, Fitzallan Square ; SOUTHAMPTON : 16 Westwood Road ; SWANSEA : Metropole Chambers, Salubrious Passage, Wind Street ; TUNBRIDGE WELLS : 31 Upper Grosvenor Road ; WOLVERHAMPTON : 3 Queen Street ; WREXHAM : 30 Grosvenor Road.

MIDWIFERY :

The courses of training, conduct of examinations, issue of certificates, and the conditions of admission to the Roll of Midwives are regulated by the Central Midwives' Board for England and Wales, The Central Midwives' Board for Scotland, and the Joint Nursing and Midwives' Council for Northern Ireland. Pupils are registered through training institutions approved by the appropriate Board, and must generally be over twenty years of age. Training is in two

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parts: (a) 18 months, or six months for S.R.N.s or State-registered Sick Children's Nurses with three years' general training or any equivalent which may from time to time be recognised by the General Nursing Council for England and Wales; followed by (b) six months for all candidates. Successful candidates are granted certificates (S.C.M.), and after they have submitted evidence to the Board that they have been found proficient in the administration of nitrous oxide and air analgesia, are admitted to the Roll of Midwives. Additional courses are held for the Midwife Teachers' Certificate Examination, for S.R.N.s and S.C.M.s of three years' standing, with satisfactory experience in teaching, and refresher courses are normally organised locally.

The Ministry of Health grants financial assistance for midwives demobilised from the Services to enable them to undergo a refresher course lasting up to three months. Information may be obtained from the General Secretary, College of Midwives, 57, Lower Belgrave Street, London, S.W.1, or from the Secretary, Department of Health for Scotland (M. and C. Branch, Room 27), St. Andrew's House, Edinburgh. The scheme is open to other State-certified midwives who have not practised recently.

Under the National Health Service, Institutional midwifery will be the responsibility of the Regional Hospital Board, while the domiciliary service will continue to be in the charge of the local authorities.

Special Government allowances are announced for trainees.

HEALTH VISITING :

Health visiting is concerned with the education of the people in healthy living, and home visiting is the most important part of the work. Health visitors work in maternity and child welfare centres, and may also act as school nurses and tuberculosis visitors.

Students must have a good general education, and must be either (a) trained nurses with the Certificate of the Central Midwives' Board (Part I), in which case the training lasts for six months (to be extended to nine months), (b) women who have undergone an approved course of training in public

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health work lasting two years, with six months' hospital training, and who have obtained the Certificate of the Central Midwives' Board (Part I). In practice it is found that the majority of local authorities, who are the appointing authorities, require those with nursing qualifications. Information may be obtained from the Women Public Health Officers' Association, 7 Victoria Street, S.W.1, from the Royal Sanitary Institute, Buckingham Palace Road, London, S.W.1, and from the Royal Sanitary Association of Scotland.

The Government grants financial assistance to State-registered nurses who wish to take a whole-time course of training as health visitors. Applicants must be under the age of 35, be registered on the General Part of the State Register or on the Part of the Register for Sick Children's Nurses, have obtained or intend to obtain the First Certificate of the Central Midwives' Board, and have a good general education. Applications should be sent to the Secretary, Ministry of Health, Division 4A(III), Whitehall, London, S.W.1. Applications for the six Government scholarships of £100 for State-registered nurses in Scotland who want to train as health visitors should be addressed to the Secretary, Department of Health for Scotland (M. and C. Branch, Room 27), St. Andrew's House, Edinburgh 1.

INSTITUTIONS RECOGNISED BY THE MINISTER OF HEALTH FOR THE TRAINING OF HEALTH VISITORS WHO ARE TRAINED NURSES :

Battersea Polytechnic, S.W.11; Bedford College for Women, Regent's Park, N.W.1; Birmingham City Council; College of Nursing, 1a Henrietta Place, W.1; Bristol City Council; Cardiff Welsh National School of Medicine, Institute of Preventive Medicine; County of Durham Board for the training of Health Visitors; Essex County Council; Hull University College; King's College of Household and Social Science, W.8; Leeds University; Liverpool School of Hygiene; Manchester College of Technology; National Health Society, London; Newcastle-on-Tyne City Council; Nottingham University College; Shoreditch Metropolitan Borough Council; Glasgow University; Edinburgh University; Bristol University.

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APPROVED INSTITUTIONS WITH TWO-YEAR COURSES :

Bedford College, Regent's Park, N.W.1 ; King's College of Household and Social Science, W.8 ; Battersea Polytechnic, S.W.11.

NURSERY NURSING :

The training in nursery nursing—the care of healthy children up to 5 years of age—has recently become a national responsibility. The Ministries of Health and Education have set up a National Nursery Examination Board which is to be responsible for all arrangements connected with the examination for the newly instituted National Nursery Certificate. The Ministries themselves are to approve the training schools.

Training in nursery nursing is to be given in day and residential nurseries, nursery schools and nursery classes ; it is free of charge and an annual allowance is given to resident and non-resident students, who are usually between the ages of 15 and 18 years of age, although some authorities will take them younger or older. The length of training is two years, at the end of which time students can sit for the National Nursery Certificate, provided they have reached the age of 17 years. Application should be made to the local Employment Exchange or Juvenile Employment Bureau, since the Ministry of Labour and National Service does the placing of students in nurseries under this scheme.

Nursery training colleges, as distinct from this provision, offer training lasting 18 months to students who are over 17½ years of age ; there is a two years' training for younger girls at some of the colleges. Each college has its own curriculum, some specialising in dietetics, some in nursery school work and so on. At the end of the course satisfactory students receive the College Certificate, and are then eligible to sit for the Nursery Nurse's Examination held at the Royal Sanitary Institute in conjunction with the Association of Nursery Training Colleges. Students are also eligible to take the National Nursery Certificate Examination. The Government is offering grants for free training in the colleges affiliated to the Association of Nursery Training Colleges to women who have done national service during the war ; particulars may

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be obtained from the Nursing Appointments Office, Spencer House, St. James's Place, London, S.W.1.

Qualified nursery nurses may secure appointments on the staffs of nurseries and children's homes, or in private families, or may undertake further training as general or sick children's nurses. The Child Welfare Workers' Employment Bureau, run by the National Society of Children's Nurseries, places qualified nursery nurses in nurseries, children's homes and private families.

Further information may be obtained from the Hon. Secretary, National Society of Children's Nurseries, 117 Piccadilly, London, W.1, and from the Secretary, The Association of Nursery Training Colleges Limited, 8 Chester Road, Northwood, Middlesex.

Residential homes run by the constituent organisations of the Associated Council of Children's Homes (*i.e.* Waifs and Strays Society, etc.) participate in the Government training scheme.

The Mothercraft Training Society, which is affiliated to the Association of Nursery Training Colleges, in addition to the course for nursery nurses conducts courses in mothercraft for trained nurses and midwives. Details may be obtained from the Nursing Director, Mothercraft Training Society, Cromwell House, Highgate, London, N.6.

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SANITARY INSPECTORS :

The examination for the sanitary inspectors certificate for appointments in England and Wales is conducted by the Royal Sanitary Institute and Sanitary Inspectors Examination Joint Board, 90 Buckingham Palace Road, London, S.W.1. Candidates for examination must be in possession of an educational qualification approved by the Board, have completed an approved course of theoretical training (such courses at present extend over periods of from one to three years), and must also undergo practical training in the public health department of a local authority for a minimum period of one year.

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A similar examination for sanitary inspectors for appointments outside England and Wales is held by the Royal Sanitary Institute, 90 Buckingham Palace Road, London, S.W.1. This Institute also conducts the following examinations for qualified sanitary inspectors: Inspection of Meat and Other Foods,* Tropical Hygiene,* Membership Qualification in the Advanced Knowledge of Carrying out a Sanitary Inspector's duties. Other examinations held by the Institute are those in Sanitary Science as applied to Buildings and Public Works, General Hygiene and Sanitation, Food Hygiene, Smoke Inspection,* School Hygiene, Nursery Nursing, Nutrition in Relation to Catering and Cooking, and Examinations for Health Visitors for appointments in England and Wales, with a similar examination for health visitors and school nurses for appointments overseas.

Any of the above mentioned certificates qualify for election to Associateship of the Institute. Certificated sanitary inspectors and health visitors who have been for seven years Associates are eligible for election to Membership. The examination in Sanitary Science alone qualifies for election to Membership.

PHARMACY :

The qualifying examinations for entry to the profession of pharmacy are those leading to the qualification " Pharmaceutical Chemist " (registration under the Pharmacy Act, 1852), or the qualification of " Chemist and Druggist " (with registration under the Pharmacy Act, 1868). If a University degree in pharmacy is taken, then the student will be examined in Forensic Pharmacy only at the Pharmaceutical Chemist qualifying examination. The degree course occupies three or four years after matriculation. Before registration with the Pharmaceutical Society, it is necessary in addition to have completed a practical course of study, in an approved pharmacy or hospital, of at least 4,000 hours, either before or after the examination (if taken before, it must be under articles of pupillage).

A university degree is not a necessary qualification and a

** Certificated Sanitary Inspectors who hold one of these certificates also qualify for membership.*

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student may alternatively take the Pharmaceutical Chemist Qualifying Examination. The period of study is the same as for a degree. If the Chemist and Druggist Qualifying Examination is taken, the period is one year shorter. An examination in general education (*e.g.* matriculation) is necessary before commencing the courses.

The registers of Pharmaceutical Chemists and of Chemists and Druggists are maintained by the Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, W.C.1.

Degrees in Pharmacy may be taken at the universities of Glasgow, Leeds, London (internal or external), Manchester and Wales (University College of South Wales and Monmouth, Cardiff). Post-qualification diplomas granted by the Pharmaceutical Society by Examination are the Diploma in Bio-chemical Analysis, and the Diploma in Pharmaceutical Analysis.

In addition to work in retail pharmacy, there are openings in hospitals, firms of manufacturing chemists, as public analysts under the Food and Drugs Acts, and a limited number of posts in teaching, the Navy, Civil Service, and with the staffs of pharmaceutical papers and organisations. For some of these further qualifications, such as a degree in science, may be advantageous.

MEDICAL AUXILIARIES :

The Board of Registration of Medical Auxiliaries (B.M.A. House, Tavistock Square, London, W.C.1) has prepared and published a register of persons properly qualified and competent to undertake various forms of treatment auxiliary to that of the medical profession. The approval of organisations and registration of members is on a voluntary basis, but the National Register of Medical Auxiliary Services contains the names of over 12,000 medical auxiliaries. These are :

(a) *Radiographers* : Radiographers are technical assistants employed in the *x*-ray departments of hospitals or clinics responsible for diagnostic and therapeutic *x*-ray work. The qualifying body is the Society of Radiographers, 32 Welbeck Street, W.1. The training course covers two years.

(b) *Dispensing Opticians* : Dispensing Opticians confine their activities to dispensing the prescriptions of medical men

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and the manufacture of appliances. The qualifying body is the Association of Dispensing Opticians, 36 Cavendish Square, London, W.1. Candidates for the final examination must have had four and a half years of practical experience.

(c) *Chiropodists*: Qualified chiropodists may work in private practice, in hospitals, in municipal clinics or in welfare departments of industrial concerns. The qualifying body is the Society of Chiropodists, 21 Cavendish Square, London, W.1. The course covers two years at an approved school of chiropody.

(d) *Speech Therapists*: Most qualified speech therapists work under local education authorities as part of the School Medical Service; others work in private practice and in hospital speech clinics. The qualifying body is the College of Speech Therapists, 68 Queen's Gardens, London, W.2. The training course lasts for two to three years.

(e) *Orthoptics*: Orthoptists' work is concerned with the development of binocular vision and the correction of muscular imbalances, and as they are registered medical auxiliaries it is only done under the direction of an ophthalmic surgeon or general practitioner practising ophthalmology. Orthoptists are employed in hospital and local authority clinics and/or engage in private practice. The qualifying body is the Orthoptic Board, Secretary, Miss Craig, Midgarth, Oxshott, Surrey. Training lasts for two years.

(f) *Dietitians*: The qualifying body is the British Dietetic Association, 342 Abbey House, Victoria Street, London, S.W.1. Training depends on previous qualifications, and is often taken by those possessing qualifications in domestic science, pure science, nursing or institutional management. Dietitians may be employed as caterers in hospitals or schools or institutions, in special diet work in hospitals, as supervisors of canteens and school meals, on dietary surveys and in food education. Diplomas in dietetics are offered by the universities of Leeds and London, and by various domestic science colleges.

OCCUPATIONAL THERAPISTS:

Occupational therapy aims at the rehabilitation of the patient by transferring his focus of attention from himself

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and his disability to some external interest. The qualifying body is the Association of Occupational Therapists, 251 Brompton Road, London, S.W.3. The qualifying examination is the Diploma of the Association of Occupational Therapists. Candidates must have a good general education, and undergo a course of training for three years, which may be taken at one of the following centres, to which direct application should be made :

Dorset House School of Occupational Therapy, Chunnhill Hospital, Oxford ; The Occupational Therapy Centre, 12-14 Merton Rise, London, N.W.3 ; The School of Occupational Therapy, St. Andrew's Hospital, Northampton ; St. Loyes School of Occupational Therapy, Newstead, Matford Avenue, Exeter ; The Liverpool School of Occupational Therapy, Victoria Road, Huyton, near Liverpool.

PHYSIOTHERAPISTS :

The qualifying body is the Chartered Society of Physiotherapy, Tavistock House (North), Tavistock Square, London, W.C.1, which offers certificates in the following subjects : Massage and Medical Gymnastics ; Electrotherapy conjointly ; Light and Electrotherapy ; Electrotherapy for Blind Candidates ; Hydrotherapy ; Teacher of Massage and Medical Gymnastics ; Teacher of Medical Electrotherapy ; and Teacher of Hydrotherapy. The training for a qualified physiotherapist lasts three years, while a further 18 months or two years of training lead to qualifications as a teacher. The Government offers financial assistance for the teacher training.

OPTICIANS :

The qualifying examinations, which conform to the standard required by the Ophthalmic Benefit Approved Committee (which keeps a list of Opticians), are :

- Fellowship of the British Optical Association (F.B.O.A.) ;
- Fellowship of the National Association of Opticians (F.N.A.O.) ;
- Fellowship of the Scottish Association of Opticians (F.S.A.O.) ;

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Fellowship of the Worshipful Company of Spectacle Makers (F.S.M.C.) ;

Membership of the Institute of Chemist - Opticians (M.I.C.O.) (for qualified pharmacists only).

Training lasts from two to three years, and may be taken at a technical college, with practical experience with a practising optician.

DISPENSING :

The Society of Apothecaries offers a Certificate in Dispensing for candidates with practical experience in pharmacy who have followed a nine months' course in chemistry.

MEDICAL LABORATORY TECHNOLOGY :

Medical laboratory technology includes clinical, public health, manufacturing and academic laboratory work, which includes care and maintenance of apparatus, carrying out of tests, and carrying out of processes. Courses and examinations are conducted by the Institute of Medical Laboratory Technology, 15-16 Buckingham Street, London, W.C.2.

HYGIENE :

The Royal Institute of Public Health and Hygiene is an examining body which issues certificates and diplomas in General Hygiene, School Hygiene, and Mothercraft and Child Welfare.

PHYSICAL EDUCATION :

Men and women with qualifications in physical education are employed as teachers, organisers of physical training in schools, organisers of recreative physical training, and remedial gymnasts. The full course of training lasts for three years, and there are also shorter courses for certain classes ; information may be obtained from the Ling Physical Education Association, Hamilton House, Bidborough Street, London, W.C.1. The Ministries of Health and Labour are giving a six months' course of training to selected ex-service physical training instructors who wish to become remedial gymnasts in hospitals.

INSTITUTIONAL MANAGEMENT

Courses of one to two years are conducted at most

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domestic science colleges, while a degree in Household and Social Science, is offered by King's College of Household and Social Science, University of London, and a degree in Domestic Science by Bristol University.

There are various openings, mainly for women, in schools, colleges, hospitals, hostels and other institutions, and in connection with the school meals' service. Full details may be obtained from the Institutional Management Association, 29 Gordon Square, London, W.C.1.

CATERING

The Minister of Education in 1946 approved a scheme to improve standards of catering, including training facilities leading to recognised qualifications. Training is being organised on a regional basis, and includes courses on basic training, specialised training for certain sections of the industry, and for executive posts. The basic training scheme will lead to a national certificate for students who pass the City and Guilds Institute examination.

Information may be obtained from the National Council for Hotel and Catering Education, 185 Piccadilly, London, W.1.

Courses in industrial catering are offered by the South-East London Technical Institute, Lewisham Way, London, S.E.4, and by many domestic science and technical colleges. Information may be obtained from the Industrial Catering Association, 28 Ennerdale Road, Richmond, Surrey, and from the National Society of Caterers to Industry, 83 Pall Mall, London, S.W.1.

DOMESTIC SCIENCE DEMONSTRATING

A domestic science diploma is usually required by those who wish to demonstrate cooking and food products.

The Electrical Association for Women, 35 Grosvenor Place, London, W.1, offers a Certificate and Diploma in Electrical Housecraft. Information relating to training for gas demonstrating may be obtained from the British Commercial Gas Association, Gas Industry House, 1 Grosvenor Place, London, S.W.1.

CHAPTER IX

LAW

IN order to become a barrister, it is necessary to become a student at one of the four Inns of Court, *i.e.* the Inner Temple, Middle Temple, Lincoln's Inn or Gray's Inn. The regulations may be obtained from the Under Treasurer of the Inn concerned. Subjects of the Bar Examination may be studied at the Inns of Court School of Law, or privately or at a university.

It is general to read in chambers for a year after being called to the Bar, as a preliminary to practising, while other fields of work are to be found in the Civil Service, local government and Colonial Service.

Details of entry are found in the schedule to the Consolidated Regulations of the Inns of Court, obtainable from the Council of Legal Education, 15 Old Square, London, W.C.2. Information regarding the Scottish Bar may be obtained from the Clerk of Intrans, Advocates' Library, Parliament Square, Edinburgh. Information regarding Northern Ireland is obtainable from the Under Treasurer, Honourable Society of the Inns of Court of Northern Ireland, Royal Courts of Justice (Ulster), Belfast.

In order to become a solicitor, it is necessary to obtain practical experience as an articled pupil in a solicitor's office while studying for the examination of the Law Society. The period of articles, five years, may be shortened for holders of a university degree or certain other qualifications. Details may be obtained from the Law Society, Bell Yard, London, W.C.2.

The Council of the Law Society provides refresher courses for members of H.M. Forces, and maintains employment registers. There are openings in private practice, local government as Clerks and Town Clerks, and in the Civil Service.

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Details regarding Scotland may be obtained from the Clerk, General Council of Solicitors, 15 York Place, Edinburgh, and regarding Northern Ireland from the Secretary, Incorporated Law Society of Northern Ireland, Royal Courts of Justice, Belfast.

POLICE

Men and women candidates entering a police force must satisfy certain conditions regarding height and age, and pass an entrance examination or hold an exempting qualification such as a School Certificate. Men must be over five feet eight inches in height, and women over five feet four inches.

Training is given after appointment, and probationary service lasts for two years, during which certain examinations are held. Qualifying examinations are also held for promotion to sergeant and inspector rank. The Newsam Committee on Higher Training for the Police Service in England and Wales, reporting in 1946, recommended the establishment of a residential police college to provide courses for inspectors and those of higher ranks, and for junior officers, and emphasised the desirability of promoting outstanding young officers for college training. A White Paper, issued in March 1947, outlined the Government's decision to establish a police college, to include a junior residential course of six months, and a senior residential course of three months.

Detailed information regarding entry to the profession may be obtained from the Home Office or the Scottish Home Department, or from the Chief Constable of a local town; the Commissioner of Police of the Metropolis (Recruiting Branch), New Scotland Yard, London, S.W.1; or The Commissioner of Police for the City of London, 26 Old Jewry, London, E.C.2.

CHAPTER X

SOCIAL SERVICES

THE social services are being increasingly staffed by persons holding university degrees, diplomas or certificates in social science, and a preference is generally shown for candidates with university qualifications. In most cases the university course is designed to provide a general background for the specialist training, lasting about one year, which follows. Training may be followed by careers in both central and local government and with voluntary organisations. They include those of factory inspectors; hospital almoners; housing managers; juvenile employment officers; psychiatric social workers; public assistance officers; welfare workers for the blind, deaf and mentally deficient; moral welfare workers; personnel managers and welfare workers in industry; wardens of settlements and community centres and youth leaders; and secretaries of relief committees and charity organisations. Particulars of courses may be obtained from the organisations concerned, the universities and from the Joint University Council for Social Studies and Public Administration, 5 Victoria Street, London, S.W.1. The William Temple College, Hawarden, near Chester, provides a one-year course of theological and social studies; information may be obtained from the Secretary, Room 155, Church House, Dean's Yard, Westminster, London, S.W.1. Detailed information on training and employment in social work is also contained in the Report on Employment and Training of Social Workers by the Carnegie U.K. Trust (Comely Park House, Dunfermline, Fife). The Trust is considering the possibility of establishing a Carnegie School of Social Work for the training of social workers.

SOCIAL SERVICES

AFTER CARE WORK

The After Care Association (Physically Handicapped Youth) employs two types of workers. Executive employment officers are required to hold a certificate in social service, and to have some experience of industry. Social workers, who are employed in home visiting, are not required to hold a social science certificate although it is desirable, but should have good experience and some knowledge of health services.

Information may be obtained from the Secretary, After Care Association, 2 Old Queen Street, Westminster, London, S.W.1.

CARE OF CHILDREN

The whole question of the training of those responsible for the care of children deprived of a normal home life has been under review since the publication of the Curtis Report, and in August 1947, the Home Office announced the establishment of a Central Training Council in Child Care. This Council is responsible for the organisation of courses and selection of students for training. Five training centres for "house mothers" conduct a fourteen months' course for those between the ages of 18 and 35; a national certificate in child care is awarded. There is also a one-year university course for boarding-out officers, who are responsible for the inspection of foster homes; applicants, between the ages of 21 and 40, should be graduates or have a social science diploma or equivalent qualification. Men between the ages of 25 and 35 may apply for both courses. Financial grants towards the cost of training are made. Information may be obtained from the Central Training Council, Home Office (Room 416), London, S.W.1.

The Inspectorate of the Home Office Children's Department is recruited from persons with suitable experience and with a qualification in social science or domestic science or institutional management, or other recognised training in educational or social work. Information may be obtained

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from the Establishment Office, Home Office, Whitehall, London, S.W.1.

The Provisional National Council for Mental Health, 39 Queen Anne Street, London, W.1, conducts short courses for boarding-out visitors.

The National Council of Associated Children's Homes conducts a training scheme for its own staffs and for the personnel of local authority homes, as well as for new entrants.

The Home Office approved schools are run by local authorities and by various voluntary bodies. Posts available include those of head teachers, assistant teachers, house-masters, instructors, farm bailiffs, clerks, welfare officers, matrons, cottage mothers, and nurses, for which the usual qualifications and training are necessary. There is no specific training for the work, but new teachers are given training in approved schools, and refresher courses are organised by the Ministry of Education and local authorities. Information may be obtained from the Chief Inspector, Children's Branch, Home Office, Whitehall, London, S.W.1. Similar work is available in remand homes. The Committee on Remuneration and Conditions of Service in Approved Schools and Remand Homes recommended in 1946 improved conditions of salary, accommodation for staff and amenities, and it proposed special training of one year for work in these schools.

CHURCH WORK

Social and moral welfare work is undertaken by lay workers in the Church of England (who take the Inter-Diocesan Certificate of Recognition issued by the Central Council for Women's Church Work, 5 Victoria Street, London, S.W.1), in the Church of Scotland (information from the Secretary, Women's Home Mission Committee, 121 George Street, Edinburgh, 2), the Congregational Church (information from the Secretary, Federation of Congregational Women, 17 Memorial Hall, Farringdon Street, London, E.C.4) and in the Presbyterian Church of England (information from the Hon. Secretary, Downs Way, Seale Hill, Reigate, Surrey). Similar work is undertaken by deaconesses

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in the Church of England (information from the Secretary, Council for the Order of Deaconesses, The House of St. Joseph, Hindhead, Surrey), the Church of Scotland, the Methodist Church (information from the Warden, Deaconess College, Ilkley, Yorkshire), and in the Baptist Church (information from the Organising Secretary, Women's Department, Baptist Church House, 4 Southampton Row, London, W.C.1).

EDUCATION OF THE BLIND

Home teachers of the blind work for the Certificate of the College of Teachers of the Blind, Dorton House, Dorton, Nr. Aylesbury, Bucks., while some voluntary associations for the welfare of the blind provide training for their own employees. These include the Southern Regional Association for the Blind, 14 Howick Place, Westminster, London, S.W.1 ; The Northern Counties Association for the Blind, 17 Blenheim Terrace, Leeds, 2 ; The Western Counties Association for the Blind, Garston House, Knowles Hill, Newton Abbot, Devon ; and the Wales and Monmouthshire Regional Council for the Blind, 12 Clifton Place, Newport, Monmouthshire.

FAMILY CASE WORK

Specialised training lasts for one year, after the taking of a Social Science Certificate, Diploma or Degree. Information may be obtained from the Training Secretary, Family Case Workers' Association, Denison House, 296 Vauxhall Bridge Road, London, S.W.1. Information regarding the one and two-year courses conducted by the Y.W.C.A. may be obtained from the Head of Training, Y.W.C.A. College, 12 Netherhall Gardens, London, N.W.3, or the Personnel Secretary, Y.W.C.A. National Offices, Great Russell Street, London, W.C.1.

HOSPITAL ADMINISTRATOR

The hospital administrator is the senior non-medical administrative officer at a hospital. There is no specific training, and the general method of entry is to secure an appointment

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as a junior clerk in a hospital, and work for the professional examinations of the Institute of Hospital Administrators or of the Poor Law Examinations Board (the latter for local authority hospital staff). The examinations of the Chartered Institute of Secretaries, and a qualification in Public Administration taken at a university are also useful.

The Institute of Hospital Administrators issues a diploma in Hospital Administration. In accordance with the recommendations of the Report of the Joint Committee on the Training and Qualification of Hospital Administrators (October 1945) the Institute's examinations have been revised to provide for a standard examination common to all sections of the hospital service in place of the former sectional examinations conducted by the Institute. At the same time, the Institute's Examination Committee has been reconstituted to include representatives of Government departments, employing authorities, universities, etc. The examination is conducted annually in two parts, Intermediate and Final. Entry to the examinations is restricted to persons on the Institute's Register of Students, who must produce evidence of general education of matriculation or school certificate standard. Before entry to the Final examination candidates must have completed not less than three years in approved hospital service. Upon passing the Final examination and subject to completion of not less than five years' approved hospital service, students become eligible for election to Associateship of the Institute. Refresher courses are also organised by the Institute.

Candidates for the Poor Law Examinations must have had one year's administrative experience in a hospital or two years' under a local authority.

King Edward's Hospital Fund provides a series of bursaries for training in hospital administration, tenable at the larger voluntary hospitals.

HOSPITAL ALMONER

The work of the hospital almoner is concerned with the personal and social difficulties of patients. In addition to intensive work with patients, the almoner is concerned with

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arrangements for convalescent, sanatorium and other institutional treatment, after-care and comfort of the acutely and chronically ill, provision of surgical appliances, and with home nursing or supervision and the supply of extra nourishment. There are also administrative responsibilities, and general responsibilities, including participation in the social aspect of medical research, training of students, hospital policy and liaison work between the hospital and social organisation and public authorities. Training lasts for eleven months after the taking of an approved degree or diploma. Information may be obtained from the Institute of Almoners, Tavistock House (North), Tavistock Square, London, W.C.1, which is also organising an emergency course of training for older students between the ages of 25 and 35.

HOUSING MANAGEMENT

Housing Management is concerned with the administration of housing estates, from both the business and social service point of view and involves the control of lettings, collection of rents, maintenance and general relations between landlord and tenant. Training lasts for at least one year, and the student should be over 18 years and have a general education up to School Certificate standard.

The Society of Women Housing Managers, 13 Suffolk Street, London, S.W.1, undertakes the training of women students and provides a two-year course comprising both theoretical and supervised practical tuition. Students are placed in selected offices to work under a member of the Society, and are trained in methods based on the work of Octavia Hill. The qualifying examinations recognised by the Society are the Women Housing Managers' Certificate, the Professional Examinations of the Royal Institution of Chartered Surveyors, and the B.Sc. (Estate Management) of London University.

The Institute of Housing, 18 Ashley Place, Victoria Street, London, S.W.1, arranges practical training under a member of the Institute, and theoretical training by correspondence courses, lasting two to three years, for those

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employed in the housing department of a local authority or by a housing association.

Employment is available with local authorities, Government departments, housing associations, public and private trusts and private persons.

LIBRARIANSHIP

A student may enter a library at the age of about 17, having attained a School Certificate standard of education (generally including a foreign language), while for university and technical library work a university degree is usually required. Professional status is acquired through the Library Association, which conducts Entrance, Registration and Final Examinations. Tuition is given at various technical colleges, and at the University College School of Librarianship, London. Correspondence courses are arranged by the Association of Assistant Librarians, of which details may be obtained from Mrs. S. W. Martin, Carnegie Library, Herne Hill Road, London, S.E.24. The University of London School of Librarianship, University College, Gower Street, W.C.1, provides a full-time course leading to the Diploma in Librarianship, lasting one year for graduates and two years for others, while part-time students may spend three or four years on the course. The College also conducts a one-year refresher course for ex-service librarians who are working for the final examination of the Library Association.

MORAL WELFARE

Employment may be found with diocesan and other moral welfare associations and committees, probation committees and other services. Training consists in one to three years' residential courses for women in Social and Moral Welfare in which the Social Science course of Liverpool University may be included.

Information may be obtained from the Josephine Butler Memorial House, 6 Abercromby Square, Liverpool, 7.

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NEIGHBOURHOOD WORK

Appointments as wardens of community centres or settlements, or as secretaries of community associations are secured after training courses lasting one year. They are organised by the Joint Committee on Recruitment and Training for Neighbourhood Workers. Inquiries should be addressed to the Honorary Secretary, Joint Committee on Recruitment and Training for Neighbourhood Workers, 26 Bedford Square, London, W.C.1.

While the training scheme is developing, the Society of Neighbourhood Workers recommends that people who are to be considered as applicants for secretaryships should have some theoretical training, some practical experience in social service, and some training or experience in administration, finance and book-keeping.

The Ministry of Education and Scottish Education Department arrange courses of various lengths.

PERSONNEL MANAGEMENT AND WELFARE SUPERVISION

Training for personnel management is undertaken by certain universities in collaboration with the Institute of Personnel Management, 70 Old Broad Street, London, E.C.2, which selects students for the final stages of training and which also arranges practical training. The minimum requirement in practical work is two separate months each in a different type of industry, and experience as an operative in a factory is useful. Theoretical requirements are covered by one of the following : (a) a degree in any faculty (preferably in history, economics, commerce, sociology or Modern Greats), followed by one year post-graduate course in social science ; (b) a degree which includes social science ; (c) a two-year Social Science Certificate.

PROBATION WORK

Probation work is a personal form of social work. The probation officer supervises adult and juvenile offenders who

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have been released on probation, makes investigations and reports to the Courts on the history and environment of selected cases, acts as conciliator in domestic difficulties, and helps and advises those discharged from approved schools and Borstal institutions. Great importance is attached to character and personality in the selection of candidates for training by the Probation Training Board of the Home Office. Appointments are made by the Home Office for London and by Magistrates in the provinces.

Training consists in (a) a Social Science Diploma or Certificate, followed by specialised training both in theory and practical work ; or (b) short course of nine to twelve months. Candidates should be between the ages of 22 and 36. Application forms and particulars of service and training grants may be obtained from the Secretary, Probation Training Board, Home Office, Whitehall, London, S.W.1. The Scottish Central Probation Council maintains a central register of men and women considered to be suitable candidates for the probation service.

PSYCHIATRIC SOCIAL WORK

Psychiatric social work consists of social work with adults and children suffering from mental disturbance and presenting personality or behaviour problems. The worker is generally employed by a mental hospital or child guidance clinic, and collects information on home conditions. Training consists in a Degree or Certificate in Social Science followed by practical experience and a mental health course at a university. Information may be obtained from the Provisional National Council for Mental Health, 39, Queen Anne Street, London, W.1.

PSYCHOLOGY

Psychology is generally studied at a university, either as an initial degree or as a post-graduate course. For teachers,

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a qualification in psychology may lead to posts in connection with the training of teachers, inspection, administration, research, child guidance and probation work, vocational guidance, or with examining bodies such as the Civil Service Commission. In industry, there is an increasing amount of scope in connection with industrial psychology and industrial health, while there are some openings with the Industrial Health Research Board (the Medical Research Council) and the National Institute of Industrial Psychology. Industrial work is concerned with the study of industrial fatigue, vocational selection and training, and labour efficiency and industrial relations.

The National Institute of Industrial Psychology, Aldwych House, Aldwych, London, W.C.2, which conducts research and maintains a staff of experts, has arranged a course for those unable to take a degree or diploma and working in industry, commerce, education or social work. Information may be obtained from the Secretary.

A diploma in educational psychology may be taken at the universities of Birmingham and London. Information relating to psychological work in connection with education may be obtained from the Provisional National Council for Mental Health, 39 Queen Anne Street, London, W.1; the Child Guidance Training Centre, Woodside Hospital, Woodside Avenue, London, N.10; and the Institute of Child Psychology, 6 Pembridge Villas, London, W.11.

Medical psychology is normally practised by doctors who have taken a post-graduate diploma in psychological medicine, but a small number of non-medical psychologists undertakes advisory or psycho-therapeutic work in private practice and in mental hospitals. There is no standardised training for this work, but post-graduate work in psychology, practical training and suitable experience are advisable. Information regarding various forms of training may be obtained from the Provisional National Council for Mental Health, 39 Queen Anne Street, London, W.1; the Tavistock Clinic (Institute of Medical Psychology), 8 Kidderpore Avenue, London, N.W.3; and the Institute of Psycho-analysis, 96 Gloucester Place, London, W.1.

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REHABILITATION

There is scope for the social worker in the resettlement of the disabled as almoner, psychiatric social worker, occupational therapist, tuberculosis care worker (in administering the Government scheme for tuberculosis allowances), mental health worker employed by the mental deficiency committees of local authorities and by voluntary associations for mental welfare, family case worker, or district rehabilitation officer of the Ministry of Labour.

✓ YOUTH LEADERSHIP

Efforts are being made to raise the status of the profession of youth leadership to something equivalent to teaching and other branches of social work, and to improve the standard of training. One-year courses, recognised by the Ministry of Education, are conducted by the universities of Bristol, Durham, Nottingham and Swansea, and application should be made to the Registrar at the university. Some authorities have recommended integration with teacher training and subsequent interchange between the two professions. The McNair Committee recommended a course of training of three years, or one year for university graduates and those with considerable practical experience.

Government grants are made to selected students to pursue approved intensive courses of training, varying in length from three months to one year, for those with some youth experience; these courses are held at the universities of Birmingham, Bristol, Durham, Liverpool and Nottingham, Homerton College (Cambridge), the National Association of Girls' Clubs and the Young Women's Christian Association. The Youth Committee for Northern Ireland has prepared a scheme for the establishment of a permanent centre for varied courses of training for paid and voluntary youth workers.

The Scottish Youth Leadership Training Association (57 Melville Street, Edinburgh, 3), with the approval of the Scottish Education Department, conducts a fifteen-month

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course for men and women to train as full-time workers in community centres and social and recreational clubs for adults, in youth centres and clubs for young people, and in work on staffs of education authorities and voluntary organisations catering for young persons and adults ; students should generally be over 25.

The National Association of Boys' Clubs recruits and trains men as youth leaders, and recommends them to suitable vacancies ; men between the ages of 25 and 30 are appointed as club leaders, and men between 30 and 35 as organisers. Information may be obtained from the Secretary for Training, National Association of Boys' Clubs, 17 Bedford Square, London, W.C.1.

The full professional training conducted by the National Association of Girls' Clubs and Mixed Clubs consists of two years in a social science department at a university, followed by six months of practical training in youth work.

The Y.W.C.A. conducts a one-year course for women between the ages of 22 and 35, and a four-month course for graduates and others with suitable experience. Information may be obtained from the Training and Personnel Department, Y.W.C.A. National Offices, Great Russell Street, London, W.C.1. The National Under Fourteens Council, Mary Ward Settlement, Tavistock Place, London, W.C.1, provides a one-year part-time evening course in club work for the under fourteens.

Courses in Scotland are also conducted by the Scottish Association of Girls' Clubs, 12 Alva Street, Edinburgh, 2 ; the Y.W.C.A. (Scottish Division), 7 Charlotte Street, Edinburgh, 2 ; the Girl Guides' Association, 16 Coates Crescent, Edinburgh, 12 ; and the Scottish Association of Boys' Clubs, 12 Alva Street, Edinburgh, 2. A specialised type of training is conducted by the Scottish Community Drama Association and the Central Council of Physical Recreation. The Scottish Education Department encourages education authorities to develop their own schemes for training local part-time leaders. A residential one-year course for Catholics is provided at the Ogilvie Training College, Polmont, Stirlingshire, for those between the ages of 21 and 35 ; applications should be sent

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to the Secretary. The Scottish Association of Girls' Clubs also provides training by correspondence in youth leadership for those living in remote districts.

Employment is available with local education authorities, and with local and national voluntary associations. Qualities of personality and character are of outstanding importance. After the age of 40 or 45, youth leaders are recommended to transfer to other forms of social work or to administration.

CHAPTER XI

TEACHING

A GREAT expansion in the teaching profession is in progress, following upon the passing of the Education Act, 1944, and the raising of the school leaving age to 15 in April 1947. The administrative reorganisation of the training of teachers, in accordance with the recommendations of the McNair Report, has commenced, and it was announced in August 1947 that a number of universities and university colleges had indicated their willingness to accept responsibility for the training of teachers on an area basis, while others had agreed to co-operate with training colleges and local education authorities in setting up a joint body to be responsible for the training of teachers on an area basis. University Institutes of Education have been established at Birmingham, Bristol and Nottingham.

Certain changes in training of teachers may be foreshadowed by this reorganisation, but there are at present two main avenues into the profession. Those who wish to continue their academic education after leaving school at the age of eighteen, and to specialise in the teaching of one particular subject or group of subjects, may proceed to read for a university degree. This is followed by a one-year course leading to a diploma in education, which constitutes the professional training which is required by the Education Act (except in the case of exceptional academic or other attainments). Men and women who complete these courses generally obtain posts in grammar or technical schools, while those interested in education may take up appointments on the staffs of training colleges after some teaching experience. Those wishing to undertake more advanced teaching and research may take up appointments in technical colleges and universities. The year of professional training is not normally required for work

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in independent grammar schools, technical colleges or universities. Students wishing to enter a university should obtain information from the Registrar of the university concerned.

Those wishing to teach in primary and secondary modern schools normally take a training-college course lasting two years (probably to be extended to three years). Applications are sent to the Principal of the training college concerned. A list of colleges is obtainable from H.M. Stationery Office (List 172).

The Ministry of Education has established one-year emergency courses of training for men and women released from national service, mainly for those between the ages of 21 and 35. Applications may be made through the services by those in H. M. Forces, while others should apply to the Ministry of Education (Teachers' Branch), 14-22 Lennox Gardens, London, S.W.1. The course will be followed by two years of probationary service, during which each student is required to follow some part-time study. Similar emergency courses have been arranged for teachers in technical and commercial schools and colleges, and applications should be sent as above, letters to the Ministry of Education being marked "R.E. (Technical)." (Recruitment of men to the scheme is being suspended.)

The Minister of Education has announced that the emergency colleges will be retained as permanent institutions for the training of teachers.

Specialist courses should be followed by those wishing to specialise in such subjects as physical training, housecraft, music and art and craft. Men are advised to take a university or training-college course to become "qualified teachers" before specialising in physical training, while women may alternatively attend a three-year course of training at one of the recognised physical training colleges; Birmingham University has established a general degree for which physical education may be offered as one subject. Training in the teaching of housecraft consists of a three-year course at a college of domestic science. Those wishing to specialise in music may take a university degree in music, or a course at one of the recognised colleges. Intending teachers of handi-

TEACHING

craft are advised to become qualified teachers before taking a special course, but it is also possible to qualify by taking the Teacher's Certificate in Handicrafts of the City and Guilds of London Institute (Department of Technology, 31 Brechin Place, London, S.W.7). Those wishing to specialise in art and craft may work for the Ministry of Education Art Teacher's Diploma, the Diploma of the Royal College of Art, the London University Diploma of the Slade School of Art, or the B.A. degree in Art of the Universities of Durham (King's College, Newcastle-on-Tyne) and Reading.

Those who wish to teach in special schools for handicapped children should become qualified teachers in the normal way, before taking special training for the work contemplated. Those interested in teaching of the deaf may obtain information from the University of Manchester Department of Education of the Deaf, and from the National Institute for the Deaf, 105 Gower Street, London, W.C.1. Those wishing to teach in Home Office Approved Schools may obtain information from the Chief Inspector, Children's Branch, Home Office, Whitehall, London, S.W.1.

There will be increased scope for adult education work when progress has been made with the establishment of the county colleges envisaged in the Education Act, 1944. Such work at present is mainly conducted by the extra-mural departments of universities and the Workers' Educational Association.

Men who wish to undertake educational work in the services normally are required to be university graduates, and are granted temporary commissions. Information may be obtained from The Director, Education Department, Admiralty, London, S.W.1, and The Air Ministry (A.R.I.), Kingsway, London, W.C.2.

CHAPTER XII

FINANCIAL GRANTS

THE costs of training described in this book vary considerably, and there are numerous bodies which provide financial assistance for students, while the costs of education are being progressively reduced by the State. Government bursaries are designed to ensure that any student who is capable of profiting by a university education will not be prevented for financial reasons from entering a university. The number of State Scholarships was increased in 1947 from 360 to 750 ; these are granted on the results of the Higher School Certificate examination. Technical State Scholarships, up to 100 in number, are offered to students from institutions of further education who have completed a course leading to an ordinary national certificate or diploma ; applications should be sent to the Ministry of Education through the Principal of the institution. Up to 20 State Scholarships are offered to students of mature age ; applications should be sent to a local education authority or other recognised responsible body. In addition, local education authorities offer annually between 1,500 and 2,000 major awards for university education. Information regarding agricultural scholarships is obtainable from the Ministry of Agriculture and Fisheries.

Assistance in the form of foundation and other scholarships is also offered by the universities ; application should be made to the university concerned. A further large number of grants and scholarships is offered by the professional institutions and societies, industrial firms and commercial companies. The conditions attached to these vary, as do the amounts. They are normally advertised in the press, and information may generally be obtained from the professional organisations listed in this book.

Grants and fellowships for research are provided by uni-

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versity authorities, professional organisations, Government departments and business firms. Lack of space prohibits the inclusion of detailed lists of these, and information should be sought from the various organisations.

The various bodies responsible for professional training provide financial assistance to selected students, and details of Government grants for this purpose may be obtained from the Ministry of Education.

APPENDIX A

**CENTRES FOR EDUCATION
IN AGRICULTURE AND HORTICULTURE
ENGLAND AND WALES**

I.—UNIVERSITIES

<i>Name</i>	<i>Courses</i>
Cambridge	Ordinary B.A. degrees in Agriculture and in Estate Management Duration 3 years
	Graduate diploma in Agriculture Duration 1 and 2 years
	Graduate diploma in Agricultural Science Duration 1 year
Durham (King's College, Newcastle-on-Tyne)	Pass degree in Agriculture Duration 3 years
	Honours degree in Agriculture Duration 4 years
Leeds	Pass degree in Agriculture Duration 3 years
London (Wye College, near Ashford, Kent, incorporating the South-Eastern Agricultural College and Swanley Horticultural College)	Degree in Agriculture, Horticulture Duration 3 years
	Honours degree in Agriculture Duration 3 years (minimum)
Oxford	Post-graduate diploma in Agricultural Economics Duration 1 year
	Pass degrees in Agriculture, Horticulture and Dairying Duration 3 years
	Honours degrees in Agricultural Chemistry and Agricultural Botany Duration 4 years
	*Diplomas in Agriculture, Horticulture and Dairying Duration 2 years
Reading	

* Notice has been given that the University proposes to discontinue the courses for the diplomas in Agriculture, Horticulture and Dairying. The last acceptances for the diploma in Agriculture were in October 1947, and for the diploma in Horticulture in October 1948. No date has been fixed for the diploma in Dairying.

APPENDIX A

<i>Name</i>	<i>Courses</i>
Reading (<i>continued</i>)	Diploma in Landscape Architecture Duration 3 years
	Graduate diploma in General Bacteriology Duration 1 year
	Graduate diploma in Agriculture Duration 1 year
Aberystwyth (University College of Wales)	Pass degree in Agriculture Duration 3 years
	Honours degrees in Agriculture, Chemistry (with Agricultural Chemistry), Agricultural Botany, Agricultural Economics and Zoology (with Agricultural Zoology) Duration 4 years
	Diploma in Dairying (leading to N.D.D.) Duration 2 years
Bangor (University College of North Wales)	Pass degrees in Rural Science (Agriculture, Agricultural Botany, Agricultural Chem- istry, Forestry) Duration 3 years
	Honours degrees in Agriculture, Chemistry, Agricultural Botany and Botany, Zoology Duration 4 years
Nottingham University College, School of Agri- culture, Sutton Boning- ton, Loughborough	Pass degrees in Agriculture and Horticul- ture (London)
	Post-graduate diploma in Poultry Hus- bandry Duration 1 year
	Post-graduate diploma in Dairying Duration 1 year
	Diploma in Agriculture (also for N.D.A.) Duration 3 years
	Diploma in Dairying (also for N.D.A.) Duration 3 years
	Diploma in Poultry Husbandry (also for N.D.P.) Duration 3 years
	Diploma in Horticulture Duration 3 years

II:—AGRICULTURAL COLLEGES

Agricultural and Horti- cultural College, Stud- ley, Warwickshire	Pass degree in Horticulture (London) Duration 3 years
	Diploma in Horticulture (also for N.D.H.) Duration 3 years
	Certificate in Horticulture Duration 2 years
	Certificate in Agriculture Duration 2 years
	National Diploma in Dairying Duration 2 years (plus 6 months' practical work)

PRESENT-DAY CAREERS

<i>Name</i>	<i>Courses</i>
Agricultural and Horticultural College, Studley, Warwickshire (<i>continued</i>)	Certificates of British Dairy Farmers' Association Preliminary and Intermediate Examinations of British Bee-keepers' Association
Harper Adams Agricultural College, Newport, Shropshire (with the National Institute of Poultry Husbandry)	Pass degree in Agriculture (London) Duration 3 years Diploma in Agriculture (also for N.D.A.) Duration 2 years Senior Certificate in Poultry Husbandry (also for N.D.P.) Duration 2 years
Royal Agricultural College, Cirencester, Gloucestershire	Diploma in Agriculture (also for N.D.A.) Duration 2 years Diploma in Estate Management Duration 2 years Course in Farming Duration 1 year
Seal-Hayne Agricultural College, Newton Abbot, Devonshire	Diploma in General Agriculture (also for N.D.A.) (1 year on Farm, 2 years in College) Duration 3 years Diploma in Dairying (also for N.D.D.) (1 year on Farm or in Factory, 2 years in College) Duration 3 years Diploma in Horticulture Duration 2 years Certificate in Poultry Husbandry Duration 1 year

III.—EDUCATION IN VETERINARY SCIENCE

Royal College of Veterinary Surgeons (9-10 Red Lion Square, London, W.C.1)	The Diploma of Membership of the Royal College of Veterinary Surgeons (M.R.C.V.S.) is the only qualification for practising Veterinary Medicine and Surgery Duration 5 years
Royal Veterinary College and Hospital (Camden Town, London, N.W.1)	Diploma of M.R.C.V.S. Duration 5 years Degree in Veterinary Science (B.Sc.) (London University)
University of Liverpool (School of Veterinary Science)	Diploma of M.R.C.V.S. Duration 5 years Degrees in Veterinary Science (B.V.Sc. and M.V.Sc.)

APPENDIX A

SCOTLAND

I.—UNIVERSITIES

<i>Name</i>	<i>Courses</i>
Aberdeen (Marischal College)	Ordinary degree in Agriculture Duration 3 years
	Honours degree in Agriculture Duration 4 years
Edinburgh (in conjunction with East of Scotland College of Agriculture)	Pass degree in Agriculture Duration 3 years
	Honours degree in Agriculture Duration 4 years
	Degree in Forestry
	Post-graduate diploma in Agricultural Science Duration 1 year
Glasgow*	Ordinary degree in Agriculture Duration 3 years
	Honours degree in Agriculture Duration 4 years

II.—AGRICULTURAL COLLEGES

<i>Name</i>	<i>Courses</i>
Edinburgh and East of Scotland College of Agriculture, 13 George Square, Edinburgh, 8	Pass degree in Agriculture Duration 3 years
	Honours degree in Agriculture Duration 4 years
	Degree in Forestry
	Diploma in Agriculture Duration 2 years
	Diploma in Dairying (also for N.D.D.) Duration 2 years
North of Scotland College of Agriculture (41½ Union Street, Aberdeen, and Craibstone School of Rural Domestic Economy, Craibstone, Aberdeen)	Diploma in Horticulture Duration 2 years
	Scottish diploma in Agriculture
	Scottish diploma in Dairying
	Scottish diploma in Poultry Keeping
	Combined Scottish diplomas in Agriculture and Dairying
	Combined Scottish diplomas in Dairying and Poultry Keeping
Combined Scottish diplomas in Agriculture and Poultry Keeping	
College certificate in Agriculture	

*The elementary teaching for the Degree is given at the University; the more advanced teaching is given in the West of Scotland Agricultural College.

PRESENT-DAY CAREERS

<i>Name</i>	<i>Courses</i>
West of Scotland Agricultural College (6 Blythswood Square, Glasgow, C.2, and Auchincruive, Ayr)	Degree in Agriculture Duration 3 years
	Honours degree in Agriculture
	Duration 4 years
	Diploma in Agriculture (also for N.D.A.)
	Duration 2 years
	Special course for Farmers
	Duration 1 winter session
	Short course for Farmers Duration 4 weeks
	Diploma in Dairying (also for N.D.D.)
	Duration 2 years
	Short course in Dairying
	Duration 4 weeks
	Milk Recorders' course Duration 4 weeks
	Diploma in Poultry Keeping (also for N.D.P.)
	Duration 2 years
	Short practical courses in Poultry Keeping
	Diploma in Dairying and Poultry Keeping
Duration 3 years	
Diploma in Horticulture (also for N.D.H.)	
Duration 2 years	
Certificate in Horticulture	
Short courses in Horticulture	
Courses in Bee-Keeping	
Junior Duration 8 weeks	
Senior Duration 8 weeks	
Advanced Duration 10 weeks	
Short practical courses in Bee-Keeping	

III.—EDUCATION IN VETERINARY SCIENCE

<i>Name</i>	<i>Courses</i>
Glasgow Veterinary College Incorporated (83 Buccleuch Street, Glasgow, C.3)	Diploma of M.R.C.V.S.
Royal (Dick) Veterinary College (Summerhall, Edinburgh, 9)	Diploma of M.R.C.V.S. Degree in Veterinary Science (B.Sc.) (Edin- burgh University)

APPENDIX B

APPENDIX B

UNIVERSITY COURSES IN PURE AND APPLIED SCIENCE

<i>University</i>	<i>Courses</i>
Aberdeen	Ordinary B.Sc. in Pure Science ; B.Sc. with Honours in Botany, Chemistry, Geology, Mathematics, Natural Philosophy, Anatomy, Physiology, Zoology ; Ordinary B.Sc. in Engineering ; B.Sc. Engineering with Honours (Civil, Mechanical and Electrical).
Belfast (Queen's University)	Ordinary B.Sc. in Pure Science ; B.Sc. with Honours in Astronomy, Biochemistry, Botany, Chemistry, Experimental Physics, Geology, Mathematics, Mathematical Physics, Physiology, Zoology, Civil Engineering.
College of Technology	Pass and Honours B.Sc. in Electrical Engineering, Mechanical Engineering, Naval Architecture, Chemical Technology, Textile Technology.
Birmingham	Ordinary B.Sc. in Pure Science ; B.Sc. with Honours in Anatomy, Botany, Chemistry, Geology, Mathematics, Mathematical Physics, Physics, Physiology, Zoology ; Ordinary and Honours B.Sc. in Civil Engineering, Electrical Engineering, Mechanical Engineering, Oil Engineering and Refining, Oil Engineering with Geology, Industrial Fermentation, Metallurgy, Mining ; Honours B.Sc. in Coal Utilisation ; Apprenticeship courses in Electrical and Mechanical Engineering ; Post-graduate Diplomas in Coal Mining, Malting and Brewing ; Certificate in Malting and Brewing ; Post-graduate courses in Oil Refining and Oilfield Engineering, Chemical Engineering, Mining.
Bristol	Ordinary B.Sc. in Pure Science ; B.Sc. with Honours in Botany, Chemistry, General Science, Geology, Mathematics, Physics, Zoology ; Testamur in Bacteriology and Microbiology ; Ordinary and Honours B.Sc. in Civil, Electrical, Mechanical and

PRESENT-DAY CAREERS

<i>University</i>	<i>Courses</i>
Bristol (<i>continued</i>)	Aeronautical Engineering; Diploma in Engineering; Post-graduate course in Structural Analysis.
Cambridge	Ordinary B.A.; B.A. with Honours in Mathematics, Mechanical Sciences, Natural Sciences Triposes.
Durham (Durham Division)	Ordinary B.Sc. in Pure Science; B.Sc. with Honours in Botany, Chemistry, Geology, Mathematics, Physics, Physiology, Zoology.
Durham (King's College, Newcastle-on-Tyne)	Ordinary B.Sc. in Pure Science; B.Sc. with General Honours in Pure Science; B.Sc. with Honours in Botany, Chemistry, Geology, Mathematics, Physics, Physiology, Zoology; Ordinary and Honours B.Sc. in Civil Engineering, Electrical Engineering, Mechanical Engineering, Marine Engineering, Fuel Technology, Metallurgy, Mining, Naval Architecture; Diplomas in Mining.
Edinburgh	Ordinary B.Sc. in Pure Science; B.Sc. with Honours in Biochemistry, Botany, Chemistry, Bacteriology, Geology, Mathematical Science, Physics, Physiology, Zoology; Ordinary and Honours B.Sc. in Civil Engineering, Electrical Engineering, Mechanical Engineering; Ordinary and Honours B.Sc. in Mining; Ordinary and Honours B.Sc. in Technical Chemistry; Post-graduate Diplomas in Technical Chemistry.
Glasgow	Ordinary B.Sc. in Pure Science; B.Sc. with Honours in Astronomy, Biochemistry, Botany, Chemistry, Geology, Mathematics, Natural Philosophy, Physiology, Pathology with Bacteriology; Zoology; Ordinary and Honours B.Sc. in Applied Chemistry.
Leeds	Ordinary B.Sc. in Pure Science; B.Sc. with General Honours in Pure Science; B.Sc. with Honours in Bacteriology, Biochemistry, Botany, Chemistry, Geology, Mathematics, Physics, Physics with Electrical Engineering, Physiology, Zoology; Ordinary and Honours B.Sc. in Civil Engineering, Electrical Engineering, Mechanical Engineering, Mining Engineering,

APPENDIX B

<i>University</i>	<i>Courses</i>
Leeds (<i>continued</i>)	Gas Engineering, Fuel and Metallurgy, Chemistry of Leather Manufacture, Colour Chemistry and Dyeing, Textiles, Chemical Engineering, Metallurgy; Ordinary B.Sc. in Dyeing; Diplomas in Biology, Animal Biology, Civil Engineering, Colour Chemistry, Dyeing, Electrical Engineering, Fuel and Metallurgy, Gas Engineering, Leather Manufacture, Mechanical Engineering, Mining Engineering, Mining and Metallurgy, Textile Industries; Post-graduate Diplomas in Chemical Engineering, Fuel and Metallurgy, Fuel and Refractory Materials, Fuel Technology, Gas Engineering.
Liverpool	Ordinary B.Sc. in Pure Science; B.Sc. with Honours in Bacteriology, Botany, Biochemistry, Chemistry, General Science, Mathematics, Geology, Physics, Mathematical Physics, Physiology, Oceanography, Zoology; B.Eng. in Civil Engineering, Electrical Engineering, Marine Engineering, Mechanical Engineering, Metallurgy, Metallurgical Engineering, Naval Architecture; Certificate in Engineering; Diploma in Engineering.
London	B.Sc. in Pure Science; B.Sc. with Honours in Botany, Chemistry, Geography, Geology, Mathematics, Physics, Physiology, Psychology, Zoology.
Bedford College	Ordinary B.Sc. in Pure Science; B.Sc. with Honours in Botany, Chemistry, Geography, Geology, Mathematics, Physics, Zoology.
Birkbeck College	The Imperial College is organised, under the three Colleges which form its integral parts, into departments as follows: Aeronautics (Aerodynamics, Aero-Structures and Aero-Engines); Botany with sub-departments of Plant Physiology, Plant Pathology, Bacteriology, Biochemistry; Chemistry (Inorganic and Physical, and Organic, with sub-departments of Agricultural Chemistry, and the Chemistry of Food and Drugs); Engineering, Chemical and Applied Chemistry; Engineering, Civil and Surveying; En-
Imperial College of Science and Technology, including Royal College of Science, Royal School of Mines, and City and Guilds College.	

PRESENT-DAY CAREERS

<i>University</i>	<i>Courses</i>
Imperial College of Science and Technology, including Royal College of Science, Royal School of Mines and City and Guilds College <i>(continued)</i>	ineering, Electrical; Engineering, Mechanical and Motive Power; Geology (sub-departments of Mining Geology and Oil Technology); Mathematics and Mechanics; Metallurgy; Meteorology; Mining (including Mining Surveying); Physics (sub-departments of Astrophysics, Technical Optics and Applied Geophysics); Zoology and Applied Entomology. Undergraduate Courses lead to Associateship of the Royal College of Science (A.R.C.S.), or Associateship of the Royal School of Mines (A.R.S.M.), or Associateship of the City and Guilds of London Institute (A.C.G.I.), also, where qualified, to B.Sc. (Special) or B.Sc. (Eng.) Degree, as the case may be. Post-graduate Courses lead to Diploma of Membership of the Imperial College (D.I.C.), and to higher Degrees.
King's College	B.Sc. (Special) and B.Sc. (General) degree courses for Pass or Honours in Botany, Chemistry, Geology, Mathematics, Physics, Zoology, Geography; B.Sc. (Eng.) (Honours or Pass) in Civil Engineering, Electrical Engineering, Mechanical Engineering; (Chemical Engineering discontinued); Diploma in Engineering; Certificate in Engineering, Chemical Engineering; Post-graduate courses in Civil, Electrical, Mechanical and Chemical Engineering.
Queen Mary College	Ordinary B.Sc. in Pure Science; B.Sc. with Honours in Biology, Botany, Chemistry, Geology, Mathematics, Physics, Zoology; Ordinary B.Sc.(Eng.); B.Sc.(Eng.) with Honours in Civil Engineering, Electrical Engineering, Mechanical Engineering, Aeronautical Engineering.
University College	Ordinary B.Sc. in Pure Science; B.Sc. with Honours in Botany, Chemistry, Geology, Mathematics, Physics, Zoology; Post-graduate Course in Engineering (Civil); Diploma in Chemical Engineering.
London External Degrees	B.Sc. General in three subjects; B.Sc. Special in Mathematics, Astronomy,

APPENDIX B

<i>University</i>	<i>Courses</i>
London External Degrees (<i>continued</i>)	Physics, Chemistry, Geology, Botany, Zoology, Physiology, Psychology, Anatomy, Anthropology, Geography, Statistics; B.Sc.(Eng.); B.Sc.(Eng.) (Mining); B.Sc.(Eng.) (Metallurgy).
Manchester	Ordinary B.Sc. in Pure Science; B.Sc. with Honours in Botany, Chemistry, Engineering, General Science, Geology, Mathematics, Metallurgy, Physics, Physiology, Zoology; Diploma in Bacteriology; Certificate in Engineering (Civil, Electrical, Mechanical), Mining; B.Sc.Tech. in Mining, Mechanical Engineering, Electrical Engineering, Municipal Engineering, Applied Chemistry, Textile Chemistry, Textile Industries, Building; Certificate in Technology, Mechanical Engineering, Electrical Engineering, Municipal Engineering, Applied Chemistry, Textile Chemistry, Textile Industries, Building; Post-graduate courses in Civil Engineering, Electrical Engineering, Mechanical Engineering, Geology and Mining, Metallurgy, Chemical Engineering, Electro-Chemistry, Steam Turbines, Machine Tools, Electrical Power Station Management, Design and Construction of Electrical Machinery, Textile Machinery, Municipal Engineering.
Oxford	B.A. with Honours in Mathematics, Natural Science, (Astronomy, Botany, Chemistry, Engineering, Geology, Physics, Physiology, Zoology).
Reading	B.Sc. (General) in Pure Science; B.Sc. (Special) with Honours in Botany, Chemistry, Geology, Mathematics, Physics, Zoology.
St. Andrews (and University College, Dundee)	Ordinary B.Sc. in Pure Science; B.Sc. with Honours in Astronomy, Biochemistry, Botany, Chemistry, Geology, Mathematics, Natural Philosophy, Physiology, Zoology; B.Sc. Engineering, Ordinary and Honours, in Civil Engineering, Electrical Engineering, Mechanical Engineering.
Sheffield	Ordinary B.Sc. in Pure Science; B.Sc. with Honours in Anatomy, Botany, Chemistry,

PRESENT-DAY CAREERS

<i>University</i>	<i>Courses</i>
Sheffield (<i>continued</i>)	Geography, Geology, Mathematics, Physics, Physiology, Zoology; Certificate in Biology; Ordinary B.Eng. in Civil Engineering, Electrical Engineering, Mechanical Engineering, Mining, Fuel; B.Eng. with Honours in Civil Engineering, Electrical Engineering, Mechanical Engineering, Mining Engineering; Ordinary and Honours B.Sc.Tech. in Glass Technology; Associateship in Engineering; Diploma in Mining, Glass Technology; Ordinary and Honours B.Metallurgy in Ferrous, Non-Ferrous, or Foundry Metallurgy; Associate Course in Metallurgy Founding.
Wales	
University College of Wales, Aberystwyth	Ordinary B.Sc. in Pure Science; B.Sc. with Honours in Botany, Chemistry, Geology, Mathematics, Physics, Zoology.
University College of North Wales, Bangor	Ordinary B.Sc. in Pure Science; B.Sc. with Honours in Botany, Chemistry, Electrical Engineering, Mathematics, Physics, Zoology; Diploma in Biology, Electrical Engineering; Course on Electrical Communications.
University College of South Wales and Monmouth, Cardiff	Ordinary B.Sc. in Pure Science; B.Sc. with Honours in Botany, Chemistry, Geology, Mathematics, Physics, Physiology; Diploma in Biology, Engineering, Metallurgy, Metalliferous Mining; Ordinary Degree in Metallurgy, Fuel Technology, Civil Engineering, Electrical Engineering, Mechanical Engineering, Building, Metallurgy, Mining; Post-graduate course in Mining; Special Class in Metallography; Ordinary B.Sc. in Pure Science.
University College, Swansea	B.Sc. with Honours in Botany, Chemistry, Geology, Mathematics, Physics; Ordinary and Honours B.Sc. in Metallurgy, (Ferrous and Non-Ferrous Metallurgy, Fuel and Metallography); B.Sc. with Honours in Metallurgical Engineering; Ordinary and Honours B.Sc.Eng. in Civil Engineering, Electrical Engineering, Mechanical Engineering; B.A. with Honours in Mathematics; Diploma in Mathematical Physics.

APPENDIX B

<i>University</i>	<i>Courses</i>
<i>University Colleges :</i>	
Exeter	Ordinary B.Sc. in Pure Science (London External); B.Sc. with Honours in Botany, Chemistry, Mathematics, Physics, Zoology (London External).
Hull	Ordinary B.Sc. in Pure Science (London External); B.Sc. with Honours in Botany, Chemistry, Mathematics, Physics, Zoology (London External).
Leicester	Ordinary B.Sc. in Pure Science (London External); B.Sc. with Honours in Chemistry, Mathematics, Physics, Radio, Botany, Zoology (London External).
Nottingham	Ordinary B.Sc. in Pure Science (London External); B.Sc. with Honours in Botany, Chemistry, Geology, Mathematics, Physics, Physiology, Zoology; B.Sc. Engineering, Mining Engineering (London External); Diplomas in Civil Engineering, Electrical Engineering, Mechanical Engineering, Mining Engineering, Fuel Technology, Dyeing, Textiles, Technical Mycology; Higher Diploma in Dyeing, Textiles; Post-graduate course in Textile Chemistry; Courses in Chemistry and Microscopy of Foods and Drugs, Water Supply and Sewage Disposal, Chemical Engineering, Metallurgy; Courses for persons engaged in Chemical Works; Certificate in Mining, Mine Surveying.
Southampton	Ordinary B.Sc. in Pure Science (London External); B.Sc. with Honours in Botany, Chemistry, Geography, Mathematics, Physics, Zoology; B.Sc. Engineering (London External); Post-graduate Diploma in Electronics; Courses in Aeronautics, Air Navigation, Wireless Telegraphy and Telephony.

APPENDIX C

UNIVERSITY COURSES IN SOCIAL SCIENCE

<i>University</i>	<i>Courses</i>
Birmingham	Diploma in Social Studies; Higher Diploma B.Com. (Social Study)

PRESENT-DAY CAREERS

<i>University</i>	<i>Courses</i>
Bristol	Testamur in Social Study Duration 2 years
	Higher Testamur in Social Study Duration 3 years
	✓ Diploma in Youth Leadership Duration 1 year
Durham (King's College, Newcastle-on-Tyne) (Durham Division)	✓ Diploma in Youth Service Duration 2 years (part-time)
	Diploma in Psychiatry Duration 2 years (part-time)
	Diploma in Youth Service Duration 1 year (full-time)
University College of Hull	Diploma in Social Study
Leeds	Diploma in Social Organisation and Public Service Duration 2 years
Liverpool	B.A. with Social Science (as a special subject) Duration 3-4 years
	Certificate in Social Science Duration 1-2 years
London (Bedford College) (King's College of Household and Social Science)	Certificate in Social Studies; B.A. in Sociology Duration 2 years
	B.Sc. Household and Social Science Duration 3 years
London (School of Economics and Political Science)	Certificate in Social Science and Adminis- tration; B.A. in Sociology Duration 2 years
	*Diploma in Social Studies Duration 2 years
	Certificate in Mental Health Duration 10½ months
London University Extension Tutorial Classes Council	Diploma in Sociology and Social Adminis- tration Duration 2 years
	Diploma in Psychology Duration 2 years
	Certificate in Colonial Social Studies Duration 2 years
	Diploma in Social Science (theory only)
Manchester	B.A. (Administration); Diploma in Social Study Duration 1-2 years
	Certificate in Social Administration; Dip- loma in Social Administration Duration 1-2 years

*Indicates course suspended.

APPENDIX C

<i>University</i>	<i>Courses</i>
Manchester (<i>continued</i>)	Certificate for Psychiatric Social Workers Duration 1 year
University College of Nottingham	Diploma in Social Studies Duration 2 years
	✓ Certificate in Youth Leadership Duration 1 year
Oxford	Diploma in Public and Social Administration Duration 2 years
	Certificate in Social Training Duration 1 year
	Diploma in Psychology Duration 1 year
Reading	Diploma in Social Study; Certificate in Social Study
University College, Southampton	Diploma in Social Study Duration 1-3 years
	Certificate in Social Study Duration 1 year
Wales (University College, Cardiff)	Diploma in Social Study and Training Duration 1-2 years
(University College, Swansea)	Diploma in Social Science Duration 1-2 years
	✓ Diploma in Youth Leadership Duration 1 year
Edinburgh	Diploma in Social Study Duration 1 year
	Certificate in Social Study Duration 2 years
	Certificate in Psychiatric Social Work Duration 1 year
Glasgow	Diploma in Social Study Duration 2 years
	Certificate in Social Study (theory only)
Belfast	Diploma in Social Studies (theory only) Duration 1-2 years
	Certificate in Social Studies (theory only) Duration 1-3 years

APPENDIX D

CENTRES FOR EDUCATION IN ARCHITECTURE AND TOWN PLANNING

EXAMINATIONS RECOGNISED BY THE ARCHITECTS' REGISTRATION COUNCIL FOR ADMISSION TO THE REGISTER OF ARCHITECTS.

Architectural Association School of Architecture, 34-36 Bedford Square, London, W.C.1: Diploma Final Examination.

PRESENT-DAY CAREERS

- Bartlett School of Architecture, University College, London : Final Examination for Diploma in Architecture ; Final Examination for Degree of B.A. in Architecture.
- Birmingham School of Architecture, Central School of Arts and Crafts, Birmingham : Diploma Final Examination.
- Durham University, King's College School of Architecture, Newcastle-on-Tyne : Degree of B.Arch. Final Examination ; Diploma in Architecture Final Examination.
- Edinburgh College of Art School of Architecture : Diploma Final Examination.
- Glasgow School of Architecture : Diploma Final Examination ; Glasgow University Degree of B.Sc. in Architecture Final Examination.
- Leeds College of Art School of Architecture : Diploma Examination.
- Liverpool University School of Architecture : Final Examination for Degree of Bachelor of Architecture ; Final Examination for the Diploma of Architecture.
- Manchester University School of Architecture : B.A. Degree with Honours in Architecture Final Examination ; Certificate Final Examination.
- Northern Polytechnic School of Architecture, London, N.7 : Diploma Final Examination.
- Nottingham School of Architecture, College of Arts and Crafts : Diploma Final Examination.
- Regent Street Polytechnic, London, W.1. : Diploma Final Examination of School of Architecture.
- Robert Gordon's Technical College, Aberdeen, School of Architecture : Diploma Final Examination.
- Royal Institute of British Architects : Final and Special Final Examinations.
- Sheffield University Department of Architecture : B.A. Degree with Honours in Architecture Final Examination ; Diploma Final Examination.
- Welsh School of Architecture, Cardiff : Final Examination for Degree of Bachelor of Architecture ; Diploma Examination.

SCHOOLS OF ARCHITECTURE RECOGNISED FOR EXEMPTION FROM THE R.I.B.A. FINAL EXAMINATION.

- | | |
|------------|--|
| Aberdeen | School of Architecture, Robert Gordon's Technical College. |
| Birmingham | Birmingham School of Architecture. |
| Cardiff | The Welsh School of Architecture, The Technical College. |
| Edinburgh | Edinburgh College of Art. |
| Glasgow | Glasgow School of Architecture. |
| Leeds | Leeds School of Architecture, Leeds College of Technology. |
| Liverpool | Liverpool School of Architecture, University of Liverpool. |

APPENDIX D

London	The Architectural Association, London; The University of London; The Polytechnic, Regent Street, London; The Northern Polytechnic, London.
Manchester	Victoria University.
Newcastle	School of Architecture, King's College, University of Durham.
Nottingham	Nottingham School of Architecture.
Sheffield	The University.

SCHOOLS OF ARCHITECTURE RECOGNISED FOR EXEMPTION FROM THE R.I.B.A. INTERMEDIATE EXAMINATION.

Bristol	Royal West of England Academy.
Cambridge	The University.
Dundee	Dundee School of Art.
Hull	City of Hull College of Arts and Crafts.
Leicester	The College of Arts and Crafts.
Oxford	City of Oxford School of Arts and Crafts.
Portsmouth	Southern College of Art (Portsmouth Centre).
Southend	Municipal College.

SCHOOLS OF ARCHITECTURE GRANTED PERMISSION TO SUBMIT SCHOOL DRAWINGS INSTEAD OF THE R.I.B.A. INTERMEDIATE EXAMINATION TESTIMONIES OF STUDY.

Brighton	Brighton Municipal School of Art and Technical College.
Burslem	Burslem School of Art.
Hastings	Hastings School of Art.
Plymouth	City of Plymouth School of Art.

TECHNICAL SCHOOLS AND SCHOOLS OF ART WITH ARRANGEMENTS FOR THE INSTRUCTION OF INTENDING ARCHITECTS.

Blackburn	Municipal Technical College and Art School.
Bolton	Bolton Municipal Technical College and Art School.
Bournemouth	Bournemouth Municipal College and Art School.
Bradford	Bradford Technical College and School of Art.
Burnley	Burnley Municipal Technical College and Art School.
Canterbury	Canterbury Art School.
Chelmsford	Mid-Essex Technical College and School of Art.
Cheltenham	Cheltenham Art School.
Coventry	Coventry Art School and Technical College.
Croydon	Croydon School of Art and Crafts.
Derby	Derby Technical College and Art School.
Exeter	Royal Albert Memorial School of Art.
Farnham	Farnham School of Art.

PRESENT-DAY CAREERS

Gloucester	Gloucester Art School.
Halifax	Halifax Municipal Technical College and School of Art.
Huddersfield	Huddersfield Technical College.
Keighley	Keighley Art School.
Kidderminster	Kidderminster Art School.
Kingston-upon-Thames	Kingston-upon-Thames Technical College and Art School.
Lancaster	Storey Institute Technical College and School of Art.
Leeds	Leeds College of Technology.
Liverpool	City of Liverpool Technical College.
London	Brixton School of Building; Hammersmith School of Building and Arts and Crafts.
Manchester	Manchester Municipal School of Art and College of Technology.
Newport	Newport Technical College and Art School.
Northampton	Northampton School of Art.
Norwich	Norwich Technical College and School of Arts and Crafts.
Preston	Harris Institute.
Reading	The University of Reading School of Art and Building Department.
Rugby	Rugby College of Technology and Art School.
Salford	Salford Royal Technical College and Art School.
Shrewsbury	Shrewsbury Technical College and Art School.
Southampton	Southampton University College and Art School
Southport	Victoria School of Art and Technical College.
Stockport	Stockport School of Art and College for Further Education.
Sunderland	Sunderland Technical College.
Swansea	Swansea Technical College and Art School.
Swindon	Swindon Art School.
Taunton	Taunton Art School.
Wakefield	Wakefield School of Arts and Crafts.
Weston-super-Mare	Weston-super-Mare School of Art and Science.
Wigan	Wigan Mining and Technical College and Art School.
Wimbledon	Wimbledon Technical College and Art School.
Wolverhampton	Wolverhampton Art School and Technical College.
Worthing	Worthing Art School.
Belfast	Municipal College of Technology.
Chesterfield	Chesterfield Art School.
Dagenham	S.E. Essex Technical College and Art School.
Eastbourne	Eastbourne School of Art and Crafts.
Epsom and Ewell	School of Art.
Hastings	Hastings School of Art.
Luton	Luton Technical College.
Mansfield	Mansfield School of Art and Technical College.
Rochester	Medway School of Art and Technical College.

APPENDIX E

St. Albans St. Albans School of Art.
Walthamstow S.E. Essex Technical College and School of Art.

SCHOOLS OR DEPARTMENTS OF TOWN PLANNING RECOGNISED BY THE TOWN PLANNING INSTITUTE FOR EXEMPTION FROM ITS FINAL EXAMINATION.

Durham University, King's College, Newcastle-on-Tyne.
Edinburgh College of Art, Department of Town Planning.
Leeds College of Art, Department of Town and Country Planning and Housing.
Liverpool University, Department of Civic Design.
London University, University College, Department of Town Planning.
Manchester University, Division of Town and Country Planning.
Nottingham College of Art and Crafts, Department of Town and Country Planning.
Regent Street Polytechnic, London, W.1.
School of Planning and Research for Regional Development, 34 Gordon Square, London, W.C.1.

A P P E N D I X E

CITY AND GUILDS OF LONDON INSTITUTE CERTIFICATES

CITY AND GUILDS OF LONDON INSTITUTE, DEPARTMENT OF TECHNOLOGY, 31 Brechin Place, South Kensington, London, S.W.7.

Examinations in Building Subjects :

Carpentry and Joinery ; Woodcutting Machinists' Work ; Brickwork ; Masonry ; Plasterers' Work ; Painters' and Decorators' Work ; Plumbers' Work ; Ship Plumbing, and Marine Sanitary Engineering ; Sanitary and Domestic Engineering in relation to Plumbers' Work ; Builders' Quantities ; Heating and Ventilating Engineering ; Structural Engineering.

Certificates in Chemical, Metallurgical and Allied Subjects :

Paper Manufacture ; Soap Manufacture ; Brewing ; Coal Processing, comprising Coke and By-Products Manufacture, Coal Tar Distillation and Crude Intermediate Products Manufacture, Low Temperature Carbonisation, and Hydrogenation of Coal and Oils ; Intermediate Products for Dyes and Colouring Matters ; Petroleum and Petroleum Products ; Sugar Manufacture ; Manufacture and Technology of Pigments, Paints and Varnishes (including a part-time course in Methods of Investigation in Paint Technology) ;

PRESENT-DAY CAREERS

The Technology and Chemistry of Oils, Fats and Waxes ; Technology of Plastics ; Technology of Gas Manufacture and Supply ; Gas Fitting ; The Principles and Practice of Metallurgical Operations ; Operatives' Course in Iron and Steel Manufacture ; Operatives' Course in the Manufacture and Treatment of Non-Ferrous Metals and Alloys ; Electrodeposition of Metals ; Leather Manufacture (Tanning and Dressing of Heavy and Light Leather) ; Leather Dyeing and Finishing ; The Dyeing of Silk and Rayon and Associated Fibres ; The Dyeing of Wool and Associated Fibres ; The Dyeing of Cotton and Associated Fibres ; Textile Printing ; Fuel Technology.

Certificates in Electrical Subjects :

Electrical Installation Work ; Electrical Engineering Practice ; Radio Service Work ; Telecommunications, Engineering, comprising Mathematics for Telecommunications, Telecommunications (Principles), Elementary Telecommunications Practice, Telephone Exchange Systems, Telegraphy, Radio, Lines Plant Practice, and Line Transmission.

Certificates in Mechanical Engineering and Allied Subjects :

Machine Design ; Patternmaking ; Foundry Practice and Science ; Machine Shop Engineering (Machinists', Turners' and Fitters' Work) ; Mechanical Engineers' Estimates and Specifications ; Boiler Makers' Work ; Metal Plate Work ; Railway Carriage and Wagon Construction ; Automobile Engineering Practice, comprising Motor Vehicle Service Mechanics' Work, Motor Vehicle Service Technicians' Work, Motor Vehicle Electricians' Course, and Final Examination in Motor Vehicle Technology ; Private Motor Body Work ; Commercial Motor Body Work ; Iron and Steel Shipbuilding and Naval Architecture ; Ship Joinery ; Aeronautical Engineering Practice ; Principles of Electric-Arc and Oxy-Acetylene Welding ; Boiler House Practice ; Refrigeration Practice ; Science and Technology of Refrigeration.

Certificates in Textile Subjects :

Woollen and Worsted Manufactures, comprising Raw Materials, Wool-combing, Worsted Spinning, Woollen Yarn Manufacture and Woollen and Worsted Weaving ; Cotton Spinning ; Plain Cotton Weaving ; Cotton Manufacture (Weaving) ; Flax Spinning ; Linen Weaving ; Silk and Rayon Manufacture, comprising Silk and Rayon Throwing and Spinning, Silk and Rayon Weaving, Silk and Rayon Knitting and Hosiery, Silk and Rayon Dyeing and Finishing, and Silk and Rayon Designing ; Jute Manufacture, comprising Jute Spinning and Jute Weaving ; Manufacture of Hosiery and Knitted Goods ; Mill Engineering and Services ; Industrial Organisation ; Chemistry as Applied to the Textile Industry ; Appreciation of Colour and Design for Producers.

APPENDIX F

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NATIONAL CERTIFICATES AND DIPLOMAS

National Certificates :

<i>Subject</i>	<i>Professional Bodies associated with the Ministry of Education</i>
Applied Physics	Institute of Physics.
Building	Institute of Builders.
Chemistry	Royal Institute of Chemistry.
Civil Engineering	Institution of Civil Engineers.
Commerce	Association of British Chambers of Commerce.
Craftsmen's Certificate for a Motor Vehicle Service Mechanic	National Joint Industrial Council.
Electrical Engineering	Institute of Electrical Engineers.
Mechanical Engineering	Institution of Mechanical Engineers.
Metallurgy	Iron and Steel Institute. Institution of Mining and Metallurgy. Institute of Metals.
Naval Architecture	Institution of Naval Architects. Worshipful Company of Shipwrights.
Production Engineering	Institution of Mechanical Engineers. Institution of Production Engineers.
Textiles	Textile Institute.
(In Production Engineering and Civil Engineering only Higher National Certificates are awarded)	

National Diplomas :

Building
Electrical Engineering
Mechanical Engineering

APPENDIX G

INSTITUTIONS GRANTING PROFESSIONAL QUALIFICATIONS

ARCHITECTS AND SURVEYORS, INCORPORATED ASSOCIATION OF, 43 GROSVENOR PLACE, WESTMINSTER, LONDON, S.W.1.

Status and Age

Student: over 16

Qualifications

Approved general education; approved course of study or assistant or articed pupil.

PRESENT-DAY CAREERS

<i>Status and Age</i>	<i>Qualifications</i>
Associate : over 21	Association's or other approved Examinations.
Graduate	Completed articles or four years with a qualified practitioner.
Licentiate : over 25	Approved practice.
Fellow : over 35	Election from Associated; approved practice.
<p>AUCTIONEERS' AND ESTATE AGENTS' INSTITUTE OF THE UNITED KINGDOM, 29 LINCOLN'S INN FIELD, LONDON, W.C.2.</p>	
<i>Status and Age</i>	<i>Qualifications</i>
Student : 16	Preliminary Examination of Institute or equivalent; articulated pupil or assistant in approved office.
Licentiate	Intermediate Examination of Institute; approved position in the profession.
Associate : over 21	Intermediate and Final Examinations of Institute or equivalent; articulated clerk for three years or assistant for five years or in professional practice for three years.
Fellow : over 30	Intermediate and Final Examinations of Institute or equivalent; professional practice as principal or assistant for five years.
<p>AUCTIONEERS AND LANDED PROPERTY AGENTS, INCORPORATED SOCIETY OF, 34 QUEEN'S GATE, LONDON, S.W.7.</p>	
<i>Status and Age</i>	<i>Qualifications</i>
Student : over 16	Engaged in or about to enter approved office or following approved course of study; educational standard approved by the Council.
Licentiate : over 17	Intermediate Examination of Society
Associate Member : over 21	Intermediate and Final or Direct Final Examination of Society; practical knowledge of profession for three years.
Fellow : over 25	Intermediate and Final or Direct Final Examination of Society; three years' practical knowledge as principal or manager or in some other responsible position approved by the Council.
<p>AUTOMOBILE ENGINEERS, INSTITUTION OF, 12 HOBART PLACE, LONDON, S.W.1.</p>	
<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Student : 15-21	Engaged in course of training; Common Preliminary Examination or approved equivalent.

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<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Probationary Graduate : 21-26	Engaged in approved engineering training ; Section A of the Associate Membership examination and must also pass Section B within three years of election.
Graduate : under 26	Engaged in approved engineering training and Sections A and B of the Associate Membership or other approved examination.
Post-graduate : over 24	Trained as engineer ; knowledge of theory and practice of automobile engineering ; associate membership or other approved examination.
Associate Member : over 26	Trained as engineer ; two years' responsible experience in science and practice of automobile engineering ; engaged in automobile engineering ; knowledge of theory and practice of automobile engineering ; Associate Membership or other approved examination.
Member : over 33	Responsible position in practice of automobile engineering ; thorough knowledge of theory and practice of automobile engineering, or in position of eminence in the industry. (Associate Members and Members are corporate members of the Institution and may style themselves " Chartered Automobile Engineers ").

BANKERS, INSTITUTE OF, 11 BIRCHIN LANE, LONDON, E.C.3.

<i>Grade</i>	<i>Qualifications</i>
Member	Employment on staff of recognised bank.
Associate	Institute's Examination.
Fellow	Election by Council.

BREWING, INSTITUTE OF, BREWERS' HALL, ADDLE STREET, LONDON, E.C.2.

<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Student : under 21	Engaged in study of principles and practice of fermentation industries.
Corporate Member	Companies, firms and individuals carrying on business as brewers, maltsters, distillers, etc.
Ordinary Member	Persons who are associated directly or indirectly with the fermentation industries and who by reason of their position or qualifications or attainments are in the

PRESENT-DAY CAREERS

<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Ordinary Member <i>(continued)</i>	opinion of the Council able to further the objects of the Institute.
Associate	Associateship examination; two years' practical brewing experience.
Diploma	Six years practical experience in brewing; Diploma examination.
BUILDERS, INSTITUTE OF, 48 BEDFORD SQUARE, LONDON, W.C.1.	
<i>Status and Age</i>	
Student	<i>Qualifications</i> Part I of Institute's Examination.
Probationer	Part II of Institute's Examination or equivalent.
Licentiate: over 19	Licentiate Examination.
Associate	(a) Licentiate; three years as proprietor, partner or director of a business; Associateship Examination. (b) Proprietor, partner or director and specially recommended. (c) Licentiate; three years' responsible position in the industry; Associateship Examination. (d) Responsible position in the industry, and specially recommended. (e) Licentiate; three years' responsible teaching appointment in Building; Associateship Examination. (f) Responsible teaching appointment, and specially recommended.
Member	(a) Associate or Licentiate; three years in business as master builder; Membership Examination of Institute. (b) In business as master builder and specially recommended.
BUILDING SOCIETIES INSTITUTE, 14 PARK STREET, LONDON, W.1.	
<i>Status and Age</i>	
Student: over 16	<i>Qualifications</i> Good general education.
Associate: over 21	Final Examination of Institute; responsible position or other approved qualifications may, in exceptional cases, be accepted in lieu of Institute Examination.
Subscribing Member	Employed by Building Society or engaged in Building Society work, and not eligible to be Associate or Student.
Honorary Member	Director of, Auditor, Solicitor or Surveyor to Building Society, or otherwise specially qualified; not in employment of a Building Society.

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CHARTERED SURVEYORS, ROYAL INSTITUTION OF, 12 GREAT GEORGE STREET, LONDON, S.W.1.

<i>Status and Age</i>	<i>Qualifications</i>
Student : over 17	Approved general education ; employed in a branch of the profession or full-time study for the profession.
Probationer	Institution's Examination or equivalent.
Professional Associate	Institutions' Examination or equivalent.
Fellow : over 35	Institution's Examination or equivalent ; five years' responsible experience in profession.
Special Diploma in Town Planning to Corporate Members with three years' specialisation in Town Planning ; Town Planning Joint Examination Board Examination.	
Women Housing Managers' Certificate.	

CHEMICAL ENGINEERS, INSTITUTION OF, 56 VICTORIA STREET, LONDON S.W.1.

<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Student : 16-25	Student in training for chemical engineering, or a pupil, apprentice or assistant under supervision of a corporate member, intending to become a corporate member ; membership in this grade is limited to five years.
Graduate : over 20	Good general and scientific education and employed or being trained in chemical engineering ; or approved examination in chemical engineering.
Associate Member : over 25	(a) Associate or other approved examination ; regular training and practical experience in direction or design of chemical engineering work.
over 30	(b) B.Sc. in chemical engineering or equivalent ; approved practical experience ; responsible position as chemical engineer.
	(c) Position of eminence in the profession.
Member : over 32	(a) Good general and scientific education ; regular training and practical experience as engineer ; important position of independent responsibility in chemical engineering work.
	(b) Position of eminence in the profession.

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**CHEMISTRY, ROYAL INSTITUTE OF (OF GREAT BRITAIN AND IRELAND),
30 RUSSELL SQUARE, LONDON, W.C.1.**

Full regulations regarding membership may be obtained from the Registrar.

CIVIL ENGINEERS, INSTITUTION OF, GREAT GEORGE STREET, WESTMINSTER, LONDON, S.W.1.

Status and Age

Qualifications

Student: 17-25

Recommended by member or associate member under whom he is training; approved general education.

Associate Member:
over 25

Associate Membership examination of Institution or approved equivalent; approved practical training, and experience.

Member: over 33

Associate Membership qualifications and five years' responsible experience in design or execution of important engineering work; or degree of eminence in profession.

**CLERKS OF WORKS OF GREAT BRITAIN, INSTITUTE OF, INCORPORATED,
5 BROUGHTON ROAD, THORNTON HEATH, SURREY.**

Status and Age

Qualifications

Diploma Part I: over 23

Examination or approved equivalent.

Diploma Part II; over 28

Supervisory experience as Clerk of Works, Assistant Clerk of Works or Builders' Foreman.

ELECTRICAL ENGINEERS, INSTITUTION OF, SAVOY PLACE, VICTORIA EMBANKMENT, LONDON, W.C.2.

Grade and Age of Entry

Qualifications and Examinations

Student: 17-21

Students of electrical engineering at an approved college or an engineering pupil or apprentice under the supervision of a Corporate Member.

21-28

Must also have satisfied the requirements of the Common Preliminary Examination.

Graduate: over 21

Passed Sections A and B of the Associate Membership Examination or obtained a university degree in electrical engineering or other accepted educational qualifications.

Associate: over 28

Five years' experience in a responsible position as an electrical engineer.

Associate Member:
over 26

Qualified as a Graduate and either: (a) 5 years' technical education and training and at least 2 years' responsible experience as an electrical engineer.

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<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
over 30	(b) At least 5 years in a responsible position as an electrical engineer.
Member : over 30	Must have been an Associate Member for at least three years and fulfilled other requirements such as experience in a position of superior responsibility.
FUEL INSTITUTE OF, 18 DEVONSHIRE STREET, LONDON, W.1.	
<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Student : over 16	Attending approved university college, or school, or pupil, apprentice or assistant under supervision of a member.
Associate : over 27	Interested in promotion of science or practice of fuel technology ; approved experience.
Associate Member : over 25	Institute's examinations or approved equivalent ; two years' training and one year's practical experience in fuel technology.
Member : over 33	Technically qualified in fuel technology ; five years' experience ; position of responsibility.
Fellow : over 35	Outstanding work in fuel technology.
GAS ENGINEERS, INSTITUTION OF, 1 GROSVENOR PLACE, LONDON, S.W.1.	
<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Student : 18-24	Ordinary grade Certificate of Institution, or equivalent ; engaged in approved engineering training in gas industry or reading for B.Sc. degree in gas engineering.
Associate : over 21	Higher Grade Certificate of Institution, or equivalent.
Associate Member : over 21 (over 25 if not a student of Institution)	Higher Grade Certificate of Institution or equivalent ; approved training of five years (unless student of Institution) ; responsible position as gas engineer.
Member	Responsible position as gas engineer and :
Member : over 30	(a) Diploma of Institution ; or (b) Responsible engineering position for five years ; Associate Member of Institution or Corporate Member of Institution of Civil Engineers or B.Sc. in Engineering ; or
Member : over 30	(c) Suitable education and engineering training in gas industry ; responsible position for fifteen years, and eminence in profession.

PRESENT-DAY CAREERS

HEATING AND VENTILATING ENGINEERS, INSTITUTION OF, 72-74
VICTORIA STREET, LONDON, S.W.1.

<i>Status and Age</i>	<i>Qualifications</i>
Student : over 16	Trainee, or taking full instruction at an Engineering or other approved college or technical school ; approved examination.
Graduate : over 21	Associate Membership Examination or approved equivalent.
Associate Member : over 25 over 33	Associate Membership Examination or approved equivalent ; approved training. Good general and scientific education ; responsible position in profession ; may have to pass section or sections of approved examination.
Associate : over 33	Responsible position in or expert technical knowledge of related branches of engineering or science.
Member : over 33	Associate Membership qualifications ; important responsible position or eminence in profession or a branch of engineering or science closely related technically thereto.

HIGHWAY ENGINEERS, INSTITUTION OF, 55 ROMNEY STREET, WEST-
MINSTER, LONDON, S.W.1.

<i>Status and Age</i>	<i>Qualifications</i>
Student : over 18	Matriculation or other approved qualification.
Associate	Not a Highway Engineer, but engaged in related profession or industry.
Associate Member : over 22 over 25	Institution's Examination or approved equivalent. Five years' experience in profession ; engaged in highway construction and maintenance.
Member : over 27	Hold appointment as Highway Engineer or engaged in work of highway engineering for seven years ; Institution's Examination or approved equivalent.
Fellow : over 35	Institution's Examination or approved equivalent ; considerable experience and eminence in profession.

HOUSING, INSTITUTE OF (INCORPORATED), 359 STRAND, LONDON, W.C.2.

<i>Status</i>	<i>Qualifications</i>
Student	Institute's Examinations.
Associate	Institute's Examinations.
Fellow	Institute's Examinations.

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INDUSTRIAL ADMINISTRATION, INSTITUTE OF, ARTILLERY HOUSE, ARTILLERY ROW, LONDON, S.W.1.

<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Student : 17-25	Student of any industrial, commercial or allied subject.
Graduate : over 20	Institute's examinations.
Associate : over 22	Executive position for two years; Institute's Examinations.
Associate Member : over 25	Executive experience and administrative responsibility for three years.
Member : over 30	Institute's examination. Administrative responsibility; Associate member for five years; Institute's examinations.
Fellow : over 30	High administrative responsibility.

LAND AGENTS' SOCIETY, 329 HIGH HOLBORN, LONDON, W.C.1.

<i>Status</i>	<i>Qualifications</i>
Associate	Pupil of land agent who is Fellow or Qualified Associate of the Society, or so qualified; or person qualified for election as Fellow or Qualified Associate except that he has not passed examination.
Pupil	Student of land agency with Fellow or Qualified Associate or equivalent; no responsible position.
Qualified Associate	<ul style="list-style-type: none"> (a) Qualified Associate of the Society, and by profession either a manager of a landed estate, a sub-agent or an assistant. (b) Land agent and genuine manager of a landed estate, prescribed examination, two years' practical experience, not eligible for election as Fellow. (c) Sub-agent, prescribed examination, and two years' practical experience. (d) Assistant to land agent who is Fellow or Qualified Associate or so qualified, prescribed examination, and two years' practical experience.
Fellow	<ul style="list-style-type: none"> (a) Fellow of Society, and by profession a manager of a landed estate. (b) Land agent and manager of a landed estate, managing estate of 2,000 acres, five years' responsible experience, prescribed examination.

PRESENT-DAY CAREERS

<i>Status</i>	<i>Qualifications</i>
Fellow (<i>continued</i>)	<ul style="list-style-type: none"> (c) Land agent and manager of landed estate, five years' management of 2,000 acre estate, prescribed examination. (d) Qualified member of another approved Society which has become amalgamated with the Society; fulfilled conditions entitling to Fellowship.

LANDSCAPE ARCHITECTS, INSTITUTE OF, 12 GOWER STREET, LONDON, W.C.1.

<i>Status</i>	<i>Qualifications</i>
Associate	School Certificate or equivalent standard of general education; one year's practical experience; Institute's Examinaton.

LOCOMOTIVE ENGINEERS, INSTITUTION OF, 28 VICTORIA STREET LONDON, S.W.1.

<i>Grade and Age of Entry</i>	<i>Qualifications</i>
Graduate	Good general education; engaged in technical and scientific training in locomotive engineering.
Associate Member : over 21	Ineligible for membership; good general and scientific education; regular training as mechanical engineer; engaged in and proficient in locomotive engineering.
Member : over 30	Good general and scientific education; regular training as mechanical engineer; experience in responsible position in locomotive engineering.

MARINE ENGINEERS, INSTITUTE OF, 85 MINORIES, LONDON, E.C.3.

<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Student : 17-25	Engineering apprentice or student at approved institution; exemption from the Common Preliminary Examination of Engineering Joint Examination Board.
Graduate : 20-30	Completed recognised training in engineering or shipbuilding; Section A of Associate Membership examination, or other approved examination.
Associate	(a) Board of Trade Certificate of Competence, university degree in engineering or naval architecture, or equivalent.
Associate : over 30	(b) Position of responsibility in shipping, engineering, shipbuilding or allied industry for two years.
Associate : over 30	(c) Graduate of Institute, not qualified for corporate membership.

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Grade and Age of Entry
Associate Member

Qualifications and Examinations

Companion : over 30

Member : over 30

Associate membership examination ; position of responsibility for two years in science and practice of marine engineering or shipbuilding ; apprenticeship of five years or university degree ; and two years' practical experience of engineering or naval architecture ; Board of Trade Extra First Class Certificate of Competency or University degree (or diploma) and Board of Trade Certificate of Competency or Associate-Membership examination of Institute.

Position of eminence in shipping, engineering, shipbuilding or allied industry for at least five years, but ineligible for membership.

(a) Board of Trade First Class Certificate of Competency or equivalent for five years and responsible position in science or practice of marine engineering.

(b) Position of responsibility for at least five years in science or practice of marine engineering or shipbuilding, and an apprenticeship of five years or a university degree and two years' practical experience.

MECHANICAL ENGINEERS, INSTITUTION OF, STOREY'S GATE, ST. JAMES'S PARK, LONDON, S.W.1.

Grade and Age of Entry
Student : over 16

Qualifications and Examinations

Associate Member :
over 25

Graduate : 21-30

Member : over 33 (if associate member) over 35 (if not associate member)

Common Preliminary Examination or similar examination, and receiving or intending to receive regular training as mechanical engineer.

Associate Membership Examination or equivalent ; regular training as mechanical engineer ; practical experience.

Sections A and B of Associate Membership or equivalent ; regular training as mechanical engineer.

Same as for Associate Membership, with position of responsibility in engineering science of practice ; or position of eminence in engineering science or practice.

PRESENT-DAY CAREERS

MINING AND METALLURGY, INSTITUTION OF, SALISBURY HOUSE, FINSBURY CIRCUS, LONDON, E.C.2.

<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Student : over 18	Undergoing education and training as mining engineer or metallurgist.
Associate : over 25	(a) Graduate of Royal School of Mines or equivalent and two years' experience in mining or metallurgy ; (b) Graduate of another school and three years' experience ; (c) Six years' experience in mining or metallurgy.
Member : over 30	Five years in charge of mining or metallurgical operations, or in practice as consulting mining engineer or metallurgist ; three years' regular training in pure or applied science ; or outstanding contribution to Science or Technology.

MINING ENGINEERS, INSTITUTION OF, SALISBURY HOUSE, FINSBURY CIRCUS, LONDON, E.C.2.

<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Student : under 25	Qualifying for profession of mining engineering.
Associate : over 25	Desires to promote science or practice of mining and holds approved position but ineligible for corporate membership.
Associate Member : over 23	(a) Intending to qualify as Member ; approved examination ; or (b) Contributed to advancement of science or practice of mining engineering.
Member : over 30	(a) Fully qualified mining engineer ; statutory qualification of a colliery manager or equivalent ; five years' experience responsible position ; or (b) Eminent position in science or technology.
Honorary Member	Distinguished by attainments or outstanding contribution to advancement of mining or other branches of technology.

MUNICIPAL ENGINEERS, INSTITUTION OF, 84 ECCLESTON SQUARE, LONDON, S.W.1.

<i>Status and Age</i>	<i>Qualifications</i>
Student : over 17	Passed Engineering Common Preliminary Examination or approved equivalent ; regular course of training as an articled pupil, indentured apprentice, engineering learner or graduate assistant ; or, having

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<i>Status and Age</i>	<i>Qualifications</i>
Student : over 17 (<i>continued</i>)	undergone such training, holds appointment with local authority or public authority as engineering or surveying assistant or resident engineer or technical officer on engineering or surveying works ; or student at university working for degree in Municipal or Civil Engineering.
Associate : over 23	Engaged in teaching of municipal engineering or allied subjects or otherwise qualified to concur in advancement of professional knowledge ; hold approved degree or qualification.
Associate Member : over 23	Hold in service of a local or public authority appointment as engineering or surveying assistant or resident engineer or technical officer on engineering or surveying works ; Institution's Testamur Examination or County and Highway Engineering Examination or approved equivalent.
Member : over 30	Institution's Testamur Examination or County and Highway Engineering Examination or approved equivalent ; hold appointment with local or public authority as engineer and/or surveyor at head of department (for one year), deputy engineer and/or surveyor in control of technical staff (for two years), principal or chief technical assistant in control of technical staff (for three years), divisional or district engineer or surveyor in charge of works in a main division of a county or county borough (for three years), or other technical officer of equivalent experience and responsibility (for two years)
Honorary Member NAVAL ARCHITECTS, INSTITUTION OF, 10 UPPER BELGRAVE STREET, LONDON, S.W.1.	Eminent scientific position or acquirements.
<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Student : 18-25	Apprenticed artiled pupil or student in naval architecture or marine engineering ; good general education.
Associate Member : over 25	University degree or suitable technical education ; served apprenticeship or pupilage or approved mixed training of four years ; professional employment approved by Institution ; or civil or mechanical engineer employed for at least

PRESENT-DAY CAREERS

<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Associate Member : over 25 (<i>continued</i>)	seven years in a shipbuilding yard or marine engineering works.
Member : over 30	Associate membership regulations, with position of primary responsibility for at least five or seven years ; or good general education, professional training, and ten years' employment in position of responsibility for design or execution of important shipbuilding or marine engineering work, with position of distinction in the profession.
Associate : over 25	Non-professional, but qualified by occupation to discuss with Naval Architects the qualities of a ship.

PHYSICS, INSTITUTE OF, 19 ALBEMARLE STREET, LONDON, W.1.

<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Student : over 16	Good general education, student in physics at approved institution or pupil in approved laboratory or works.
Associate : over 21	(a) Good general education ; recognised degree or diploma ; one year's full-time experience in work demanding knowledge of physics under approved conditions. (b) Knowledge of physics equivalent to degree standard ; three years' full-time experience in approved research or development work ; evidence of initiative and originality.
Fellow	(a) Recognised degree or diploma and five years' full-time approved research work or responsible professional employment as physicist. (b) Outstanding contribution to physics.

PETROLEUM, INSTITUTE OF, PORTLAND PLACE, LONDON, W.1.

<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Student : over 18	Good general education ; following approved course of study leading to membership or fellowship of Institute.
Associate Member : over 23	Ineligible for fellowship or membership, but connected with petroleum or allied industries.
Member : over 28	Good general education ; either responsible position in petroleum industry for five years or qualified by position and attainments.

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Grade and Age of Entry
Fellow : over 28

Qualifications and Examinations
Good general and scientific education ; responsible position in science or technology of petroleum for five years ; have advanced science and technology of petroleum or qualified by reason of position and attainments.

PLASTICS INDUSTRY, INSTITUTE OF THE, WINDSOR HOUSE, VICTORIA STREET, LONDON, S.W.1.

Grade and Age of Entry

Qualifications and Examinations

Ordinary Member
Associate : over 25

Engaged in Plastics Industry.
Institute's Diploma Course ; Associateship examination of Institute ; three years' experience in the industry after diploma standard.

Fellow

Outstanding services to plastics industry.

PRODUCTION ENGINEERS, INSTITUTION OF, 36 PORTMAN SQUARE, LONDON, W.1.

INSTITUTION OF, 36 PORTMAN SQUARE,

Grade and Age of Entry

Qualifications and Examinations

Student : 16-25

Approved general education ; practical training in production engineering ; attending approved course of study.

Graduate : 21-32

Practical training in production engineering ; graduate examination of Institution or other approved examination.

Intermediate Associate
Member : over 28

Good general education ; scientific and engineering training ; engaged in production engineering for four years.

Associate Member :
over 28

Education and practical training as for membership, together with employment for four years in science and practice of engineering as applied to production and hold position of responsibility.

Member : over 33

Approved standard of education ; served apprenticeship ; position of independent responsibility in practice of engineering production.

RADIO ENGINEERS, BRITISH INSTITUTION OF, 9 BEDFORD SQUARE, LONDON, W.C.1.

Grade and Age of Entry

Qualifications and Examinations

Student : over 16

Good general education ; registered student qualifying for the profession of radio engineering.

Graduate : over 18

Institution's graduateship examination ; employed or trained in a branch of radio or allied engineering, or teacher of radio subjects undergoing a course of training.

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<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Associate : over 21	Regular education in electronic knowledge and engaged for three years in radio or allied engineering ; engaged in technical capacity in application or teaching of radio or allied engineering ; Institution's graduateship or approved examination or thesis.
Associate Member : over 27	Trained and regularly engaged for five years as radio engineer ; position of responsibility for three years or important research work ; approved examination or paper or thesis ; engaged in radio science
Member : over 30	Regular education in electronic science and regularly engaged for seven years in technical capacity in radio or allied engineering ; position of superior responsibility for five years and research or important work ; scientific qualifications or Institution's examinations or approved thesis.
Companion : over 35	Important services to radio engineering, or high degree of responsibility in radio industry.
ROYAL AERONAUTICAL SOCIETY, 4 HAMILTON PLACE, LONDON, W.1.	
<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Student : 18-25	Articled apprentices, pupils or assistants of Fellows, in R.A.F. or engineering firms, or in approved college of engineering or science ; training for profession of aeronautics ; Common preliminary examination of Engineering Joint Examination Board or approved equivalent.
Graduate : 21-28	Associate Fellowship examination or equivalent ; approved training for professions of aeronautics.
Associate : over 25	Engaged in work on or connected with aircraft ; ground engineer's certificate in at least three categories, or position as inspector or examiner of materials for three years, or Pilot's " B " licence or Navigator's certificate, or commissioned or warrant rank in R.A.F. for three years, or position equivalent to that of foreman in aero works for three years.
Associate Fellow : over 25	(a) Engaged in design or construction in profession of aeronautics, or in application to aeronautics of special branches

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<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Associate Fellow : over 25 (<i>continued</i>)	of science, mathematics or engineering or in development of science of aeronautics, or as teacher of aeronautics ; Associate Fellowship examination or equivalent ; five years' experience in aeronautics.
Associate Fellow : over 40	(b) 15 years' experience ; position of responsibility ; Associate Fellowship examination or equivalent.
Fellow : over 28	Fulfil conditions of Associate Fellowship ; five years in position of responsibility ; eminence in profession of aeronautics.

ROYAL INSTITUTE OF BRITISH ARCHITECTS, 66 PORTLAND PLACE,
LONDON, W.1.

<i>Status and Age</i>	<i>Qualifications</i>
Probationer	School Certificate or equivalent ; knowledge of drawing.
Student : over 19	Intermediate Examination of R.I.B.A. or approved equivalent.
Associate : over 21	Final Examination of R.I.B.A. or approved equivalent ; one year's practical experience in architect's office or on a building.
Licentiate : over 30	On register of Registered Architects ; five years' practice as principal or ten years' practice or study of architecture.
Fellow : over 30	Associate : seven years' practice as principal. Licentiate : seven years' practice as principal, samples of working drawings and photographs, examination.
Distinction in Town Planning	Fellow, Associate or Licentiate ; applications considered upon nomination of three members of R.I.B.A.
Diploma in Town Planning	Fellow, Associate or Licentiate ; Final Examination of Town Planning Joint Examination Board.
Examination for office of Building Surveyor under Local Authorities.	

RUBBER INDUSTRY, INSTITUTION OF, 12 WHITEHALL, LONDON, S.W.1.

<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Licentiate : over 19	Students in approved training ; Institution's examination.
Associate : over 21	Higher degree of a University, or F.R.I.C. in subject of Rubber Technology ; or by examination.
Fellow : over 30	Associate of five years' standing, ten years'

PRESENT-DAY CAREERS

<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Fellow : over 30 <i>(continued)</i>	experience in rubber industry, research or inventions and responsible position.
Fellow	Non-Associate, in exceptional cases as recognition of eminent and distinguished service to the industry, by invitation from the General Council.
SANITARY ENGINEERS, INSTITUTION OF, 118 VICTORIA STREET, LONDON, S.W.1.	
<i>Status and Age</i>	
Student : over 18	<i>Qualifications</i> Institution's Examination or equivalent ; engaged in sanitary engineering work or articulated to a sanitary engineer.
Associate : over 21	Good education ; practice as sanitary engineer or in allied work.
Associate Member : over 25 (or 21)	Institution's Examination or equivalent ; good general education ; approved training as sanitary engineer ; two years' experience.
Member : over 35 (or 30 if passed recognised examination)	Nominated by two corporate members ; good education ; approved training as sanitary engineer ; five years' responsible experience.
Fellow : over 36	Member for one year ; outstanding merit in profession.
STRUCTURAL ENGINEERS, INSTITUTION OF, 11 UPPER BELGRAVE STREET, LONDON, S.W.1.	
<i>Status and Age</i>	
Student : 17 to 25	<i>Qualifications</i> Studying or intending to study profession of structural engineering ; preliminary or other approved examination.
Graduate : 21 to 30	Studying or intending to study profession of structural engineering ; Institution's Graduateship examination or approved equivalent.
Associate Member : over 25	Qualified structural engineer ; regular training and practical experience in structural engineering ; Institution's Associate Membership Examination.
Associate : over 30	Member of profession allied or kindred to structural engineering ; or position of responsibility in connection with structural engineering ; professional standing equivalent to that of Member.
Member : over 30	Engaged in profession of structural engineering, and Associate Membership examination ; five years' responsible

APPENDIX G

Status and Age

Member: over 30
(continued)
over 35

Qualifications

experience in important structural engineering work.
Engaged in profession of structural engineering; 15 years' responsible experience; eminence in profession.

TEXTILE INSTITUTE, 16 ST. MARY'S PARSONAGE, MANCHESTER, 3.

Grade and Age of Entry

Associateship: 25

Qualifications and Examinations

- (a) Graduate in textile technology in approved institution, or equivalent examination: two years' experience in responsible direction and control of textile work.
- (b) School certificate or Institute's Preliminary Examination; special qualification in one branch of textile technology; Institute's examination in General Textile Technology; and two years' experience in responsible direction and control of textile work.
- (c) Approved university degree; special knowledge of one branch of textile technology; Institute's Examination in General Textile Technology; and two years' experience in responsible direction and control of textile work.

Fellowship: 28

- (a) Three years' approved occupation in the practice, teaching or profession of Textile Technology since election to Associateship; and made a substantial contribution to the advancement of knowledge relating to the Textile Industries.
- (b) Three years' approved occupation in the practice, teaching or profession of Textile Technology since election to Associateship; training in textile technology equivalent to that of Associateship; and made a substantial contribution to the advancement of knowledge relating to the Textile Industries.

TOWN PLANNING INSTITUTE, 18 ASHLEY PLACE, LONDON, S.W.1.

Status and Age

Student: 18
Associate Member: 23

Qualifications

Approved general education.
Final Examination of Joint Examination

PRESENT-DAY CAREERS

<i>Status and Age</i>	<i>Qualifications</i>
Associate Member : 23 (continued)	Board ; approved practical experience in town planning.
Member : 30	Associate Member of Institute ; approved practical experience.
Legal Associate Member : 23	Legal Associate Membership Examination ; qualified legal practitioner, town clerk, etc., or chief assistant to a Legal Member of the Institute, or a responsible assistant to town clerk, etc., working in connection with a planning scheme.
Legal Member : 30	Qualified legal practitioner ; practical experience in connection with town planning schemes ; Legal Associate Membership Examination of Institute.

WATER ENGINEERS, INSTITUTION OF, PARLIAMENT MANSIONS, ABBEY ORCHARD STREET, WESTMINSTER, LONDON, S.W.1.

<i>Status and Age</i>	<i>Qualifications</i>
Student : over 18	Student of Institution of Civil Engineers.
Associate : over 40 (temporarily closed)	Responsible position in Water Works.
Professional Associate : over 40	Eminence in profession ; special knowledge or experience.
Associate Member : over 25	Corporate Member of Institution of Civil Engineers ; passed Hydraulics section of Associate Membership Examination of Institution of Civil Engineers ; responsible position in water engineering.
Member : over 33	Corporate Member of Institution of Civil Engineers ; either Associate Member of Institution of Water Engineers or equivalent qualifications ; important position of independent responsibility in water works.
over 45	Suitable education as civil engineer ; 15 years' employment in responsible position ; eminence in profession of water engineering.

WELDING, INSTITUTE OF, 2 BUCKINGHAM PALACE GARDENS, BUCKINGHAM PALACE ROAD, LONDON, S.W.1.

<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Student : under 25 (cannot remain after 28)	Passed Common Preliminary of Engineering Joint Examination Board or exempting examination.
Associate	Skilled welder who satisfied Council as to proficiency and continuous experience over five years ; or has completed a full

APPENDIX G

<i>Grade and Age of Entry</i>	<i>Qualifications and Examinations</i>
Associate (<i>continued</i>)	course in principles and practice of welding at an approved institution and has had three years' continuous practical experience.
Graduate; 21-28 (cannot remain after 30)	(a) Making progress to qualify for A.M. having passed prescribed sections of A.M. examination or obtained exemption; and received or receiving training for responsible post, practical, technical or scientific; or (b) Student who has not qualified for A.M. or Associate, on reaching age of 28.
Companion Member	Non-technical, having contributed to development and holding senior position of responsibility in use of welding or manufacture of supplies.
Associate Member : over 25	Engaged in technical or scientific capacity in use of welding or manufacture of supplies for five years minimum; passed examination or been exempted; holding subordinate executive or other position of technical or scientific responsibility in use of welding, or manufacture of supplies. (Research and teaching appointments recognised; Commission in Technical Branch of Forces recognised; Thesis may be accepted in lieu of examination.)
Member : over 30	(a) Associate Member qualified under these by-laws, holding for sufficient period important position of technical or scientific responsibility in use of welding or manufacture of supplies.
Member : over 35	(b) Educational qualifications equal to A.M. and holding important position as above for five years minimum. (Research and teaching appointments recognised.)
Fellow	Of scientific or technical eminence in recognition of distinguished contributions to science or practice of welding.
Industrial Corporate Members	Class I: Company or Firm interested in welding methods, means and processes. Class II: A Trade Association or Classification Society.

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