Unusual Vaso-spastic Conditions.

The following two case reports relate facts that are not usually described in medical literature.

CASE I.

The patient was a girl of 14 years of age, who had sudden pain in her right foot two and a half years ago. This was accompanied by swelling of the foot and leg. The first attack lasted for three weeks and disappeared as suddenly as it came on. Occasionally she had been two months at a time without symptoms, but she had a prolonged attack in 1929—from February to May. For the last six months pain and swelling had been present every two or three days. The attack prior to operation had lasted seven weeks.

On examination pulsation was felt in the posterior tibial and anterior tibial arteries at the ankle. The deep reflexes were hyperexcitable and prolonged in relaxation on the right side, normal on the left. The right lower limb was cold, and there was excessive vasomotor tone, as evidenced by the slow return of colour after the removal of pressure.

Sympathetic ramisection of the right lower limb was performed on May 10th, 1930. This was followed by an immediate cessation of pain and disappearance of swelling. There has been no recurrence of her symptoms since the operation.

CASE II.

For about two years this patient had suffered from coldness in the left lower limb. The right lower limb was also affected, but not so badly. This prevented the patient from sleeping at night, and was accompanied by a feeling of heaviness and profuse perspiration. The condition had been treated elsewhere as neuritis. Exercise made the leg warmer, but it became cold soon after the patient rested.

Left lumbar sympathetic ramisection was performed on October 2nd, 1929. This was followed by immediate relief and cessation of perspiration and coldness. The right lower limb also improved as a result of operative treatment of the left side. Improvement has been maintained up to the present time.

RETINITIS PIGMENTOSA.

The latest, and a most important, application in surgery of the sympathetic nervous system is in the treatment of blindness associated with retinitis pigmentosa. This disease is characterized by degeneration of the retinal tissues and an accumulation of pigment in the substance of the retina consequent upon degeneration and constriction of the retinal vessels. The idea that the disease is caused by degeneration of retinal vessels is supported by experimental evidence. Another suggested cause is that the disease is due to a primary degeneration of nerve tissue, but it is doubtful that this occurs apart from some alteration in blood supply.

The subjective signs of the disease are: (1) night-blindness; (2) loss of visual acuity; (3) contraction of fields of vision; (4) in advanced cases total blindness.

My attention was first directed to the pathological changes in the blood vessels in this disease by Dr. Lawrence, ophthalmic surgeon of Melbourne, and I thought that, as division of the sympathetic supply of the eye would permanently dilate the vessels, the conditions underlying the disease might be altered with beneficial effect. Dr. E. A. Brearley, ophthalmic surgeon of Sydney, sent me the patients and examined them after treatment.

The operation I carried out upon these patients was thoracic sympathetic trunk section, and consisted in dividing the sympathetic trunk just about the level of the second thoracic ganglion. This operation has been described elsewhere.³

Results of Operation.

The first patient underwent operation on May 29th, 1930. During the week after operation he did not improve, but since then there has been steady improvement in the acuity of vision and in the enlargement of the fields of vision. The patient had had retinitis pigmentosa for the past ten years. Prior to operation he could not see clearly; everything was misty; for example, he could not see fingers moving at a distance of four feet. He was totally blind in the dark. He had suffered from blepharospasm of the right eye for three months prior to operation. Two weeks after operation he could tell the time on a clock with a two-inch dial, black figures on a white ground. He could also distinguish fingers moving at a distance of four feet. On June 18th he was very much improved; he could read letters half an inch high and the face of an alarm clock with a four-inch dial at a distance of eight feet. On June 24th he

reported that the fields of vision were enlarged and that the vision of the left eye was also improved, although the right thoracic sympathetic trunk only was divided in the operation. He also reported that he could read small print in a good light. The blepharospasm disappeared.

The other four patients have also had some improvement in the acuity of vision and enlargement of the fields of vision, but it is too early to state the results accurately excepting in one instance, in which the field of vision was enlarged three times in a month.

REFERENCES.

- ¹ Royle, N. D.: A New Operative Procedure in the Treatment of Spastic Paralysis and Its Experimental Basis, *Med. Journ. of Australia*, January 26th, 1927, p. 77.
- ² Wade, R. B., and Royle, N. D.: The Operative Treatment of Hirschsprung's Disease: A New Method, *ibid.*, January 29th, 1927, p. 135.
- ³ Royle, N. D.: Sympathetic Trunk Section: A New Operation for Raynaud's Disease and Spastic Paralysis of the Upper Limb, *ibid.*, October 6th, 1928, p. 436.

GENERAL OUTLINE OF THE PROBLEM OF
TRAINING HEALTH WORKERS.*

BY

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THE topic assigned to me in this symposium is the "General outline of the problem of training health workers." Health workers include university graduates in medicine, arts or science, engineering, agriculture, public health nursing, social science, and those who have received training in the duties of a sanitary inspector. Many of these possess a basic professional training and have also spent one or more years qualifying as public health administrators, bacteriologists, engineers, statisticians, etc.

In connexion with the vocational preparation of health workers, it is pertinent at the outset to consider whether universities can reasonably be expected to provide courses of study for those who wish to equip themselves for any and every type of public health work. In some universities it may be quite impossible under existing financial conditions to assume any responsibility for graduate work in public health. Others may content themselves with undergraduate teaching of the subject in the medical, arts, science, and engineering faculties. Still other institutions may indicate that they provide graduate instruction for those equipped and trained by suitable undergraduate study to profit by instruction of a real university graduate character. The fact is that university schools of hygiene in North America are largely, at the present time, limiting their activities to the preparation of students who are graduates in medicine, arts, science, or engineering. Exceptions are found in Canada, where a university school of hygiene has assumed a share in the responsibility for the instruction of graduate nurses (not university graduates) who are registered in one- or two-year certificate or diploma courses.

Adequate arrangements for the conduct of graduate work in public health or preventive medicine in a university school of hygiene leading to the degree of master of arts or doctor of science or of philosophy usually presents a monetary problem only. Assuming adequate appropriations and a suitably qualified staff, real graduate work in epidemiology, physiological hygiene, infection, and immunity, as well as in other cognate subjects, can be carried on. It is hardly necessary for such graduate students to have access to health departments, even though such a contact may have mutual advantages. Those engaged in qualifying as specialists in public health are, as a rule, doing research and possibly some teaching and will probably be called upon to occupy university positions or direct the work of certain divisions in large and important health departments. This portion of the student body of a university school of hygiene constitutes a very essential part of the whole public health occupational group. To neglect recruiting for this unit may lead to serious difficulties in the future. Public health, like

* Read in opening a discussion in the Section of Preventive Medicine at the Annual Meeting of the British Medical Association, Winnipeg, 1930.

other branches of applied science, will advance only if observation and investigation indicate the solution of complex or difficult problems. Some of the researches of this group will be most conveniently carried on in laboratories, others in the field or in the hospital or clinic, others in more than one of these.

The preparation of the specialist in bacteriology and immunology, in physiological hygiene, in epidemiology and statistics, requires several years; also a sound scientific foundation. Others with much less in the way of preparation may be qualified to do exceedingly satisfactory work of a routine character in these fields, but should not be counted upon to make novel contributions, though, of course, they may sometimes do so. Several university centres in the United States and in Canada now afford facilities for the preparation of these specialists, and there is an annual increase in the number of university graduates in honours biology, physics, chemistry, and mathematics who are entering upon careers in one of the scientific branches of public health. It is interesting to observe how largely such graduates bulk in the faculties of a number of the more recently established schools of hygiene.

Because of the economic as well as the humanitarian significance of the work of the modern public health engineer, his training can hardly be too broad or too prolonged. It is he who considers, approves, or recommends the expenditure of vast sums of money for the creation of public works which profoundly affect man's environment. These engineers, then, should truly be scientists, men of affairs, as well as lovers of beauty, if we and our descendants are to enjoy the benefits of sanitation so applied that our aesthetic and physical well-being is to be safeguarded. In at least one or two splendid institutions of higher learning in North America provision has been made for the training of public health engineers. An increase in the number of such institutions will doubtless be observed when the demand becomes insistent or the need more obvious.

What of the preparation of public health nurses or health visitors? Those emissaries of preventive medicine certainly cannot be too well equipped or too carefully prepared. They it is who, in the home, in the school, in the residential institution and elsewhere, interpret and spread the important truths of public health which, to be more effective, must be widely known and understood. As interpreters of science they have no mean task. Preventive medicine is one of the most essential of all the branches of applied science. To serve mankind fully and generously, its precepts must be understood and practised. In increasing the understanding of the potentialities of preventive medicine the public health nurse has a splendid field of service.

The equipment which is necessary to enable these public health workers to carry out their responsibilities may be obtained in special schools of nursing or university schools of hygiene. Their preparation may require one or two years' after-graduation from the nurse training school of a general hospital. A standard not less than university matriculation should be the requirement for entrance into those training schools from which public health nurses are to be recruited. The content of the courses suitable for these students is at present the subject of interesting experiments in certain university schools of hygiene in Canada and the United States. Only the technical training of sanitary inspectors can be referred to here. It may be indicated, however, that their suitable preparation for the responsible posts they occupy is a matter of interest and importance to the community at large as well as to departments of public health. Neither Canada nor the United States, apparently, has progressed in this matter as far as Great Britain. Satisfactory provision will doubtless be made in more than one Canadian university centre in the near future. Field training stations in the United States have assumed this task in a number of states where whole-time health units, county or other, have been instituted in large numbers.

Finally, before proceeding to discuss more in detail courses of study for physicians who intend to enter whole-time public health work, a word should be said about the desirability of recruiting well-trained graduates in veterinary science or agriculture for work in this field. In laboratories, in food control activities, and in general sanitation, such graduates

can and do perform important duties in many health departments in various communities in North America. Their training is of a university grade, and important contributions to science are constantly being made by certain of them. The courses of study which equip them for public health work need not be outlined here. There remains for consideration the question of the preparation of graduates in medicine for public health work.

The curricula of many schools of hygiene in the United States and Canada provide for one-year courses leading to a diploma or certificate in public health. In addition, in the United States, certain universities offer two-year courses leading to a doctorate in public health or to a doctorate of science in hygiene. It is true that these two latter courses are open to graduates in arts or science as well as to medical graduates. In one school at least the course leading to the degree of Doctor of Public Health is open to students "who have completed satisfactorily three years of the course in an approved medical school and who have had a liberal education as evidenced by a degree in arts or science or its equivalent." In an interesting statement which recently appeared in the *American Journal of Public Health* the courses of study, chosen by members of an honorary public health society organized in the United States in 1924 and now numbering 225, were presented. To quote from this statement:

"The most popular degree represented among the members of the society is the doctorate of public health (Dr. P.H.), which is held by 69 persons. Twenty of the medical graduates have obtained certificates in public health (C.P.H.) without other public health degrees, while 5 have taken the doctorate of science in hygiene (Sc.D.) Among the 129 non-medical sanitarians, the doctorate in science has been the most popular, as there are 30 such degrees. Doctors of philosophy are also numerous, 26 being listed, though mostly among faculty members. Fifty-seven of the 250 members are listed as holding only bachelor or master degrees, or certificates in public health. Many of these are, however, candidates for various doctorates, though a considerable number are already actively engaged in public health work. In tabulating the occupations of the members of the society it is significant that the largest proportion are teachers, though of course many are connected with the faculties of the institutions having chapters. About 30 are with other universities. State health departments claim 24, and local health work only 14, according to the available records. Another 25 are associated with voluntary health agencies. Only 31 of the total of 250 members are listed as being outside of the United States."

The graduate training of physicians in public health presupposes at least some undergraduate instruction in the subject. Since this latter topic is to receive extended consideration in another communication to be presented later, it will be sufficient to indicate in a few words what has been and is being done in some representative medical schools in the United States and Canada.

In 1924 there was established in the University of Toronto a course of practical instruction or field work for undergraduate students in medicine. This was in addition to the then existing forty hours' didactic and demonstration course. In general it was designed to do two things—namely, to familiarize the medical student with the opportunities which would later be open to him as a medical practitioner to practise preventive medicine, and in the second place to acquaint him with the public health resources of a modern urban community.

The course was planned to occupy between three and four weeks of the time of the student, the exercises in the course each requiring one half-day. The number of exercises has varied from twenty-eight to thirty-two, and they have been given in part in the laboratories of the School of Hygiene in the University of Toronto and partly in the Departments of Public Health of the Province of Ontario and of the City of Toronto. In addition, various farms where milk is produced, certain dairies, and some industrial establishments have been utilized for observational visits. Without the very generous and sympathetic co-operation of staffs of the health departments mentioned and the very cordial assistance of a number of private corporations and individuals, this plan of instruction could not be carried out.

One other feature of the course may be referred to. Students engage in the undertaking either in the spring at the close of the fifth year or in the fall just before the opening of the

sixth or final year of the medical curriculum. Thus the medical undergraduate has an extended experience in public health and preventive medicine at a time when he is free from the distractions of many other courses of study. This arrangement is not intended to relieve other departments of the faculty of medicine of any of their responsibilities for the so-called "permeation of the curriculum with the preventive idea." On the contrary, it is emphasized that the goal will be reached only if all departments of the medical faculty provide instruction and draw particular attention to the preventive aspects of the different subjects, both laboratory and clinical, primary and final.

This matter has been dealt with at length because, as far as the writer is aware, the Medical Faculty of the University of Toronto was the first to institute such a course of study for undergraduates. In my opinion this may lead in the future to a greater understanding of the work of the health departments by medical practitioners, a keener realization and better understanding of how physicians may participate more freely and fully in the practice of preventive medicine, and finally to an increase in the number as well as improvement in the quality of medical recruits for full-time work in the field of public health.

Other very desirable efforts designed to stimulate the interest of medical students in public health and preventive medicine have been introduced. Examples of these are—the Harvard plan requiring undergraduates to undertake a sanitary survey and present the results in a very complete and comprehensive report; the McGill arrangement whereby each student undertakes a health study of a city or town and presents a report to the department of public health and preventive medicine embodying a carefully prepared statement of the health and social welfare resources of the community studied. Finally, it is worth noting the interesting and valuable work required of undergraduate medical students in the Dalhousie Health Centre in connexion with Dalhousie University under Professor W. H. Hattie. There, through domiciliary visits, the student is afforded an opportunity of observing environmental, social, and economic conditions which so profoundly influence our efforts in the practice of preventive and curative medicine.

The medical undergraduate of to-day in many universities in the United States and Canada is very much better equipped than was his predecessor of ten, twenty, or thirty years ago, to proceed to his graduate work, which will lead him either in the one-year course to the diploma of public health in Canada or to the certificate in public health in the United States, or in the two-year course to a doctorate in Public Health or the Science of Hygiene.

The curricula for the diploma or certificate of public health vary in different universities. The major courses in all of them, however, include bacteriology, immunology, epidemiology, statistics, physiological and industrial hygiene. To these are usually added public health engineering, chemistry, nutrition, parasitology, administration, etc. In general, it may be said that where a student devotes a second year to obtaining a doctor's degree he usually spends this time in advanced work in one or two branches only. The balance between laboratory courses and practical work in the field varies also, reflecting not only differences in the viewpoints of the faculties of the universities concerned, but also the difference in opportunity for practical work and variations in the degrees of intimacy existing between teaching institutions and the public health bodies, official and voluntary, in their respective communities.

Fixed and rigid curricula for the diploma of public health have not yet emerged in Canada or in the United States. Experiments may be undertaken and changed in content or method if the results indicate that modification is desirable. This is probably fortunate in countries where universities, or at least some of them, have concerned themselves with problems relating to the training of health workers during a period of hardly more than twenty-five years. The problem has been introduced in this very general way because to others has been delegated the task of specifically setting out in greater detail the ways in which medical student, physician, public health nurse, sanitary inspector, and others may be suitably equipped to carry on the satisfying tasks of promoting health, preventing disease, as well as increasing man's length of years.

UNDERGRADUATE MEDICAL TRAINING IN PUBLIC HEALTH.*

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THERE are three major problems in the training of the undergraduate medical student in public health. The first is to provide him with at least a minimum of the factual knowledge which he will require. The second is to show him the field of work, and thus, by the visualizing of opportunities, stimulate his interest and enthusiasm to desire and acquire more knowledge. The third is to bring him to understand his responsibility for applying his knowledge for the benefit of those who will look to him as their medical adviser. It should be borne clearly in mind that we are training men to be general practitioners and not to be health officers.

Ideally, the preventive aspect of medicine should permeate the whole teaching of medicine. To what extent this is possible will vary from place to place because of the personal factors involved. This ideal should be a guiding principle, and it should tend to limit the instruction given under public health and preventive medicine in so far as it is practicable for other departments to deal adequately with the preventive aspect of their particular subject. There is no doubt that the medical student is more impressed by the teaching of his clinical instructors, and to the extent that such instructors direct attention to prevention there will be found a proportionate increase in the interest of the student body.

The medical student approaches the study of medicine as a subject of diagnosis and treatment; to him the practice of medicine means the care of the sick. Knowing this, it would appear that an early contact should be made by the Department of Public Health and Preventive Medicine with the in-coming student body, and that this contact should be maintained throughout the entire medical course. If this contact is made early, it should at least be possible to convince the student that prevention forms a large part of the practice of medicine, and that if he is to be properly equipped to practise his profession, he must be quite as well qualified to prevent disease as he is to diagnose and treat it. The approach to the student is not made with the idea that he should be less interested in diagnosis and treatment, but rather that his interests should be extended to include prevention. Particular emphasis may be placed on the fact that there is no sharp line between treatment and prevention, and that proper early treatment is essentially preventive.

In the first year the student can be shown the field of preventive medicine. He can be given some idea of its possibilities as applied to the community by organized health departments, and particularly regarding the opportunities in private practice. He should be told how medicine is becoming socialized and how the public demand for health guidance is changing the practice of medicine, in order that he may be prepared for this. Early in his course the student will welcome the subject of personal hygiene because it will enable him to talk intelligently about subjects which are everyday topics of conversation. This compensates for his ignorance of disease—a matter of embarrassment to most young students. There is also an opportunity to point out some practical applications of anatomy and physiology, and to give the student the viewpoint that an understanding of the normal is essential in the practice of medicine, as, for example, in the periodic health examination.

In the second year, the student may be introduced to public health organization. Here the approach should be through the relationship of the practitioner of medicine to the health department. If medicine, and particularly public health, is presented as one of the social resources of mankind, the student will appreciate that if he is to render proper service to his patients he must know and make use of all available community resources. The history of the development of the modern public health movement is full of interest, and serves as an excellent background upon which to fix the

* A paper read in the Section of Preventive Medicine at the Annual Meeting of the British Medical Association, Winnipeg, 1930.