REMARKS ON THE TRAINING OF OPHTHALMIC SURGEONS.

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THE Legislature has—and that properly—passed laws to regulate medical practice, and the function of the General Medical Council is to see that the medical practitioners comply with the requirements of the law. In one special branch—namely, that of dental surgery—the General Medical Council has demanded that practitioners shall have a special qualification, and shall be placed on a separate register. The reasons for this arrangement are obvious. In the first place, there are many subjects in the medical course which have no bearing, theoretical or practical, on dental work. Amongst these may be mentioned midwifery, gynaecology, and medical jurisprudence. The time of a dental student is much more usefully employed in getting a grasp of the subjects which are essential to him than in studying such matters.

In the second place, and conversely, he who would excel as a dentist must study many things which are certainly not required of the ordinary medical practitioner, such as dental mechanics, metallurgy, etc. It would therefore seem that so far as dentistry is concerned excellent regulations have been made to ensure that gentlemen who practise that part of the healing art are competent to do so.

As regards ophthalmic surgery, however, similar precautions have not yet been taken, so far as we know, either in this or in other countries. Any qualified medical man can call himself an ophthalmic surgeon and begin to practise as such. No special register is kept of such practitioners, and they do not pass through any special course of study beyond attending ophthalmic clinics and seeing ophthalmic work. This system has in the past produced some splendid eye surgeons, men quite equal to any in other branches of medical science. While that is true it will not seriously be disputed that the times have changed, that ophthalmology has in some of its aspects become more of an exact science, and that if the student is ever to become an authority in ophthalmic work, he must know and study certain subjects which are not, and probably never will be, included in the medical curriculum. It is most desirable that an ophthalmic surgeon should be as carefully prepared in his speciality as a dentist is in dentistry.

At the same time, while a man educated as an oculist should have the advantage of being placed on a separate register, it is not suggested that the right of the general practitioner to practise eye surgery should be curtailed; just as he has a right if so disposed to do dental work, so he ought also to be allowed to do ophthalmic work, but he ought not to be allowed to be placed on the proposed special register. It is difficult to define exactly the best course of education for a man who wishes to be an ophthalmic surgeon, but that some special course of study is necessary few will deny. There are subjects in the present ordinary medical curriculum which for him are superfluous and conversely some subjects of study are necessary for him which at present are entirely neglected.

Even in preliminary education a difference should be made. No one can read a thoroughly good modern textbook on ophthalmology without a better knowledge of elementary mathematics than is required of the average medical student. In addition to the geometry and algebra at present required of the ordinary student, the embryo ophthalmic surgeon ought to have a good knowledge of trigonometry. Without this he can never thoroughly master the subject of lenses, nor become conversant with prisms nor with the details of decentration. He may, it is true, work out problems in these subjects simply by rule of thumb, but he can never in any real sense know them. Moreover, without this knowledge he can never be a beneficial teacher to a large number of medical students. The days of Bob Sawyer are long gone past, and every year brings to the ophthalmic clinic an increasingly large number of men who are thoroughly well educated. It is impossible for anyone to teach ophthalmology to this class of students without knowing the groundwork of optical teach-

ing. If he attempt it, some of the students will make the discovery that they know more of the subject matter than their teacher. Here, for example, is a case in point: A patient had diplopia and attended at an ophthalmic clinic. The attending surgeon wrote down "Angle of squint 6° as measured by Maddox scale." This patient had in his early days studied something of angles. He went straight home, and found that the diplopia was 17° 50'. We presume that in this case the false image was projected to the sixth division of Maddox's well-known tangent scale. We have no intention in the very least to depreciate the admirable work done by Maddox, but the very fact that such tangent scales have been found to be necessary shows how extremely ill-prepared some ophthalmic surgeons are for their work.

In addition to trigonometry, the ophthalmic student might with advantage study something of analytical geometry. It would be of use to him to know the equations to the straight line, to the circle, and to the parabola in their simpler forms. Moreover, certain ideas contained in the calculus are for him extremely important; he ought to have some knowledge of limiting values and of such expressions as $\frac{1}{x}$. In an American textbook we once found a mistake which a competent writer could not have made. The subject under discussion was the well-known formula for accommodation, and was given in dioptries:

$$A = P - R$$

The writer went on to remark that in hypermetropia R was at infinity, so that the above formula became

$$A = P - \infty = P - 0$$

Passing on to the subjects of medical education, at the outset the general remark may be made that the ophthalmic student should have as intimate an acquaintance with medicine and surgery, especially in their clinical aspects, as is compatible with a thorough knowledge of his own work. The early parts of his course ought not widely to differ from those of an ordinary medical student. They should certainly embrace biology, chemistry, human anatomy including histology, physics, and physiology. Perhaps the subject of chemistry might be relegated to his preliminary examination, but as regards the other subjects, with the exception of physics, he should learn them much in the same way and nearly to the same extent as is presently done by students of medicine, except that in these days of good textbooks the attendance on formal lectures should be reduced to a minimum, and the courses made as largely as possible practical.

The course of physiology ought to be for the most part a laboratory one, and should include adequate instruction as to physiological optics, the movements of the eyes, the parts of the brain associated with vision and with the movements of the eyeballs. Were such a course insisted on it would be impossible to find, as we once did, a house-surgeon in a British ophthalmic hospital who could not take visual acuteness, nor measure refraction, nor use an ophthalmoscope by the indirect method. That such a man should hold so important a position shows what need there is for change.

Physics is an essential of ophthalmic training. The student ought to attend (a) a general course accompanied with laboratory instruction, and (b) a special course on light. This latter should be equivalent to that required for the advanced stage of the Science and Art Department and should be accompanied by a full laboratory course.

The student should be required to attend the optical laboratory for at least twelve months, and should be made practically acquainted with mirrors, lenses, prisms; he should also master such instruments as the spectroscope, the spectrometer, the spherometer, the optical bench, and the diffraction grating. He should also study the various methods of taking indices of refraction.

As regards the strictly medical part of his education, it will be admitted on all hands that medicine and surgery are essential. Besides a course of lectures on each of these subjects, there should be attendance on clinical instruction in medical wards for a period of at least fifteen months, and for a like period in surgical. The medical course ought to contain instruction in neurology and kindred subjects.

The subject of *materia medica* and therapeutics must be viewed in its general and special aspects. The general course at present required of a student of medicine ought to be omitted altogether. The treatment of disease so far as it can be effected by drugs should be discussed by the teachers of medicine and surgery. That an ophthalmic student should be compelled to sit through a course of instruction which is simply an extension of the *British Pharmacopœia* is simply to force him to waste valuable time which should be given to other subjects. Probably he ought to know something of the principles of the science of pharmacology; but that can readily be taught in a special short course dealing with the drugs which are essential in his practice, such as the mydriatics and myotics, mercury, opium, iodides, etc.

The days of active so-called therapeutic practice are as thoroughly at an end in ophthalmology as they are in the best forms of medical practice. Can anyone imbued with the spirit of modern ophthalmic practice revert to the old *régime* of blisters, setons, and the terrible prescriptions which were so much in vogue only a few years ago?

Pathology also should form an important element in the ophthalmic surgeon's training. This should include a general course and also a special one. The general course should be much the same as that which is given to ordinary medical students; it should be quite as extensive, and should contain the same amount of practical work.

It is essential that the ophthalmic student should have training in bacteriology. Micro-organisms play a very important part in the production of many forms of eye diseases, and the student ought to be familiar with the methods of bacteriological investigation. Moreover, a bacteriological examination of the conjunctival secretion undertaken before operation will often prevent disaster.

A course of special pathology is also desirable. How necessary it is in an ophthalmic training is abundantly shown by the fact that in a recently published and lengthy article on glaucoma, the author made not the slightest reference to obstruction of the corneo-iridic angle. That an author should be ignorant of or ignore the magnificent pathological work done in this department during the last few years by Priestley Smith, Treacher Collins, and others is simply astounding.

To what extent students should be required to attend formal lectures on diseases of the eye is a difficult matter to determine. Little good is to be obtained from teachers who simply draw up lists of symptoms characteristic of the various maladies and the different remedies suitable for their treatment. All such information can be obtained from one of the smaller textbooks, and there the student ought to get it. Exceptionally a teacher may be found whose lectures are worth attending, but such teachers are rare, and the information to be had from lectures is generally more fully contained in good textbooks.

While, therefore, attendance on formal lectures on diseases of the eye should be made optional, clinical work ought to be compulsory. It should extend over a period of at least three years, and should be taken up entirely with the examination of patients, under competent teachers. Clinical courses should include the study of (a) external diseases, (b) fundus diseases, (c) operative work, (d) refraction errors, (e) muscular defects, (f) perimetric examinations.

The student would thus be brought into direct contact with all forms of ophthalmic ailments, and would learn to recognise them as found in actual practice. This is the only method of studying disease in a useful manner. No doubt it is not everything. Much remains to be learnt in the laboratories as to the physiology and pathology of eye affections, but without clinical work, and that of the most extensive kind, book knowledge and information obtained from lectures lose much of their value.

Nor does it suffice that the student should see patients examined. He must be made day after day to examine them for himself and to report on their condition to his teachers. That is the only form of clinical instruction that is of any value. The modern practice of substituting pictorial demonstrations for the examination of patients cannot be too strongly condemned. Such exhibitions will not teach students to recognise diseases when they see them and generally are of little value.

Again, were a special register for ophthalmic surgeons instituted, there would be other advantages besides securing the better education of those practising ophthalmic surgery. It would immensely improve the status of the practitioner relatively to the public. Recently many ophthalmic surgeons have endeavoured to get the General Medical Council to prevent ordinary spectacle vendors from doing ophthalmic work. The Council has replied that at present they cannot at all interfere with this practice: all they can do is to see that medical practitioners have no improper professional connection with spectacle vendors. It cannot be denied that ophthalmic practice should be carefully regulated, and those who specially undertake such work should be specially qualified. But so long as medical practitioners have no special qualification, it is somewhat illogical that they should object to spectacle vendors prescribing, on the ground that they are not qualified.

ON THE ADVISABILITY OF THE INCLUSION OF THE STUDY OF ANÆSTHETICS AS A COMPULSORY SUBJECT IN THE MEDICAL CURRICULUM.*

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THE proposition that it is desirable to include in the curriculum prescribed by the General Medical Council the study of anæsthetics may appear too obvious for formal consideration.

It is probable that all the laity and many members of the medical profession assume that the methods of employing anæsthetics are taught in medical schools, and the subject is therefore practically included in the student's course of studies. Yet such is not the case. When, however, the matter is inquired into further and the methods of teaching are brought into prominence, there arises in some minds a certain amount of opposition. Besides the natural disinclination to embark upon new regulations and to impose fresh burdens upon students, there is a feeling that the schedule of subjects is at present quite long enough, and that the time and energies of the medical student are already more than adequately taxed. The further objection is advanced that when many subjects have to be mastered it is only right that the least important ones should be ranged behind those of greater moment. The study of anæsthetics is by many looked upon as of less importance than many other branches of medicine and surgery. It is urged that a brief experience will render the man of average intelligence a competent exponent of it, and to make him more is unnecessary unless it can be accomplished without encroaching upon more pressing studies. It is to attempt to meet these objections, which I admit are all of more or less weight, that I propose to advance the following arguments.

In the first place, there is at present no uniform teaching of anæsthetics in Great Britain. Personal zeal and the demands of the management of general hospitals have in many cases established some sort of teaching for students in this branch of knowledge. There are lectures and demonstrations, and in some cases students are instructed to give the anæsthetic in the presence of and by the guidance of the anæsthetist to the hospitals. These lectures, however, are settled by the particular anæsthetist, or the authorities of the medical school, and too often are regarded as an encroachment upon the time available for teaching other subjects. As to the practical teaching of the subject, that again varies in the different schools. It is not by any means universal. In some cases the person who gives the anæsthetic teaches by pointing out the steps in his method, and the students, until they come into hospital as residents, have never given an anæsthetic, and their knowledge is wholly theoretical. In other instances, however, a better plan is pursued, by which the student administers the chloroform or ether under

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