live in, or in the clouds and sky; open your eyes to sights of birds and insects as you walk, your ears to their songs, and your heart and intellect to the impressions of Nature. Look as well as see, listen as well as hear, touch as well as feel. Practise judging distances and making allowance for different kinds of illumination; learn to detect the optical and sensory fallacies of which you read in books on mental physiology. Exercise not only your muscles but your power of discriminating weights. Cultivate walking, and make it a pleasure as well as a convenience. Take every opportunity of learning any bodily exercise, whether riding or swimming, rowing or sailing, and, whatever you do, do it, as Fox said he did, with all your resources at the time. Learn, as you may very well, without ever being artists, to draw sufficiently to explain your meaning. Cultivate your memory, form the habit of recalling things at the proper time, and make provision for spare minutes in the day or sleepless hours at night by fixing poems in your memory or by repeating the geological strata of England, the atomic weights of the elements, the heights of mountains, or the decisive battles of the world. Never fear filling your mind too full of fresh knowledge, or suppose that the one fact will displace the other, as water poured into a full vessel adds nothing to its contents, for the mind is a physiological not a mechanical structure; the more it receives the more it will contain, and there is no limit (or none that we ordinary people can see) to the growth of knowledge so long as life endures. Never be satisfied with sham explanation or with conventional reasons, or with assertions that will not stand criticism. Beware of the commonplaces of argument, of declamation, and of criticism. Never waste time over worthless literature, and, in order to be sure of what is good, read chiefly that which has withstood devouring time, and remains to us as the carefully winnowed and approved result of the imagination, the wisdom, and the wit of past centuries. Beware of prejudices—prejudices of your profession, prejudices of your education, prejudices of your country. Remember that all you think of England, and rightly ought to think, is also thought by French and Germans and Americans and Hungarians and Japanese concerning their own country—the strength of its inhabitants, the beauty of its women, the courage of its soldiers, and its excellence in all arts and refinements of life. It is not without reason that Frenchmen speak of “La grande Nation” and Germans of “Deutschland über alles,” but such phrases do not lend themselves to translation.

Remember that in the important department of popular education little countries like Saxony and Scotland were for many years far ahead of larger and wealthier nations. And of all nations since the Reformation the most remarkable achievements in war and in navigation, in exploring and colonizing, in art, in learning, and in science, have been gained, not by the great nations, but by the little people of the Netherlands.

Here, in Birmingham, you are rightly proud of your municipal record. But just as this civic emulation does not diminish but strengthens your national patriotism, so believe that the glorious history of these little islands does not need disparagement of our neighbours. By knowledge of their history and their literature, by sympathy with their great qualities, we become more fair-minded, more liberal, and more humane.

In literature, in science, in manufactures, in pathology, in preventive medicine our fathers have left us a noble heritage; let it be ours to hand it on increased to our children.

MIDDLESEX HOSPITAL.

By FRANK J. WETHERED, M.D., F.R.C.P.,

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PRACTICE AND THEORY IN MEDICAL STUDY.

[ABSTRACT.]

AFTER some introductory remarks, Dr. Wethered proceeded: The object of the five years' curriculum is to fashion you into well-qualified medical practitioners. In order to pass the requisite examinations you will have to possess yourselves of certain knowledge. You will naturally wish to pass each examination at the first attempt, and in order to do this I strongly recommend you to remember one word, “practice.” Theoretical knowledge is of course also requisite, but above all things you must be practical.

Reading and attendance on lectures are certainly essential. Reading enables you to supplement the knowledge you have obtained by practical work, and the lectures will assist you in systematizing that knowledge. Throughout the whole of your student days you will do well to remember that for book learning there is a substitute—practical work; for practical work there is no substitute. To see much and to see it well is the sole means of attaining perfection in all the sciences of observation.

The necessity for practical work will commence from the first day of your studies; for instance, anatomy can only be learned by actual dissection, and you should, therefore, spend several hours daily in the dissecting room. The same principle, although with perhaps a little less force, applies to physiology and chemistry; work in the laboratories will engrain facts in your memory as nothing else will. More particularly I would lay stress on the fact that it is impossible to learn medicine and surgery from books; a knowledge of these subjects can only be obtained by observation and study of the patients in the wards and out-patient rooms. Speaking in the broadest sense, medicine is not only a science: it is a practical art. As an art, medicine is infinitely difficult; the phenomena with which we have to become acquainted are so numerous, so various, so complicated, that not only natural talents, but long observation are requisite to make us familiar with them.

I need hardly remind you that all who follow the medical profession must be students for ever—students as much in the fifth year of their curriculum as in the first, students as much at the end of their life's work as when confronted with their earliest patients. A physician or surgeon may draw a lesson from every case which he sees, and here again we find the difference between book-learning and the knowledge which is the outcome of practical observation. To a certain extent the need for book-learning may be finite, and to a great extent this need is modified by the idiosyncrasies of the individual. But no man from the moment that he places his foot on the lowest rung of the ladder of medicine can dispense with practical observation or its results. This need is never finite.

To carry the exercise of theory and practice in another direction. It is the custom of medical practitioners to give precise directions as to the amount and kind of exercise their patients should take. Should not the doctors set the example of what they preach? I would ask you as students to commence that practice early. If the embryo physicians and surgeons would pay more attention to the study of physical improvement as exemplified by gymnastics and manly sports I believe it would be to the benefit of the community in general. We should then hear less about the physical degeneration of the nation, and the country might be spared the expense of appointing another committee to inquire into the matter. It is now a recognized fact that a man can excel both in his studies as well as in athletic pursuits, and there is no reason why a healthy participation in manly games should interfere with professional duties. It is usually a fatal error for any one who has been accustomed to an active life to give up all forms of regular exercise; still worse is it when the lassitude is due to indulgence in alcohol, tobacco, and late hours.

A greatly-improved tone has been apparent amongst the boys of public schools since games have been made compulsory and loafing sternly discountenanced. The continuance of some form of physical exercise after school life has scarcely been sufficiently insisted on by many medical men. Moreover, the regular pursuit of some form of athletics greatly raises the moral tone of a man. The individual who wishes to improve his physical powers must cultivate habits of intemperance and self-control. Evil habits, which the self-indulgent and slovenly man so easily falls a prey to, are obnoxious to the athletic and healthy-bodied, for late hours and their numerous evil consequences will be perforce eschewed. Let the medical student, then, learn to live that he may be able to draw from his personal experience when in the future he advises his patients as to the best ways of keeping well.

An opening address at the present day can scarcely be considered complete without some reference to the London University. In the history of that institution I venture to suggest we have another illustration of theory *versus* practice. It seems strange that for so many years the largest city in the world has not possessed a teaching university. Hitherto the students of the London schools who desired to obtain a degree of Doctor of Medicine have had either to pass what is practically an honour degree or else complete their professional

education at a provincial or foreign university. London University was for many years a theoretical University, simply an examining body; now, however, it is gradually blossoming forth into a practical or teaching one.

The concentration of the earlier professional studies will probably be one of the first developments of the new régime, and for this purpose a strong effort is being made to give practical effect to the recommendation of the Royal Commissioners appointed to consider the Charter in 1894. For this purpose steps are being taken to secure a site and funds to enable the Senate to establish an institute of medical sciences in the near neighbourhood of the University. The advanced studies will then be carried out at the various hospitals, which would then become veritable clinical schools.

It is to be hoped that we shall see Chairs of Medicine and Surgery endowed at the University, so that the professors who are appointed may be able to devote their whole energies to educational purposes.

In conclusion, I would remind you that the great element of success in professional life is the accumulation of experience. The experience can only be obtained by constantly applying yourselves to practical work.

If during your student days, and subsequently when you hold resident appointments, you make full and intelligent use of the countless opportunities which will present themselves of observing the course of disease, you will never repent the labour thus expended. You will thus early gain the confidence of your patients, and may it be said of you:

His years but young, but his experience old,
His head unmellow'd but his judgement ripe.

UNIVERSITY OF MANCHESTER.

By J. LORRAIN SMITH, M.D.,
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ON THE STUDY OF PATHOLOGY IN MEDICAL EDUCATION.

[ABSTRACT.]

THE decision which has recently been taken by the University to divide the Department of Pathology into two sections has been the direct result of the rapid growth of this subject in recent years. For a considerable period that department in this school has taken a leading place in bringing about the expansion of pathology, especially in its application to public health, and under the new arrangements Professor Delépine will continue his work in a department devoted to bacteriology and comparative pathology. To him will fall the duty of teaching students of public health, and he will at the same time be provided with the means of applying bacteriological methods of investigation to the problems which arise in public sanitary administration in Manchester and its neighbourhood. In this department, the direction of which has been entrusted to my care, the student will receive instruction in general pathology and morbid anatomy.

A knowledge of the pathological changes in the human subject of disease retains all its importance for the student who intends to practise medicine, and this occasion affords a fitting opportunity for the consideration of pathology in relation to cognate subjects in the medical curriculum. In studying pathology the student finds himself in the same field as the clinician. The same subject is studied, but from a different point of view. The clinician studies the signs of disease and the mode of treatment with the purpose of discovering and applying the cure. When the study is carried a stage further, and the methods of physical science are applied to discover the nature of the changes in function and structure in the diseased tissues and organs the investigation becomes pathological.

The ultimate unity of pathology and clinical medicine is clear, however, and it is futile to attempt to divorce them from each other. The pathologist must in due measure be familiar with clinical medicine, and the clinician must keep in his mind's eye the guiding lights of pathological research.

Pathology is ultimately an experimental science, but the study of disease must in the first instance pass through a preliminary stage in which the facts regarding its occurrence and form are merely observed. At this stage it is investigated in the hospital ward and in the *post-mortem* room. When sufficient knowledge has accumulated to give some clue to the cause of the disease the investigation is transferred to the laboratory. In the laboratory pathology is studied as a biological science. The facts and methods which

the student has learnt in the earlier years of his course are applied to new problems, but no tissue is found in pathological structures that is not present in the normal body. No new chemical process is seen that has not been already exemplified in normal metabolism. In the laboratory, when the conditions are under our control, it is possible to study the obscure but all-important first stages of the process of disease.

It is in this way that pathology progresses as a science, and in order to master the subject a student must pass through a course of study which gives him the means of following the development of the science in all its stages. Pathology must be studied both in the hospital and in the laboratory.

Among the recent developments of pathology which call for the student's attention one of the most striking is that of clinical pathology. This branch of pathology comprises observations on cases of disease in the making of which the observer acquires familiarity with laboratory methods and appliances. The best example is the clinical pathology of the blood. The blood is studied by chemical and microscopical methods in relation to almost every form of disease. We may learn, for example, not only the presence of bacterial infection in the circulation or in the tissues, but also the degree of resistance which is offered to the invasion. We may further find in these phenomena the clue to the principles of treatment. Again, the study of malaria and allied conditions resolves itself into a microscopical study of the blood. Similarly, the large group of diseases affecting the constituents of the blood is studied by the methods of clinical pathology. This branch of the science is daily increasing in importance, and requires the most earnest attention of the student. It is most appropriately studied in relation to cases in the hospital wards.

When we turn to the study of pathology as a natural science we have to consider its relation to the sciences with which the student has become acquainted in the earlier years of his course. During the period in which a student is working at these sciences he ought to be forming in his mind the standards according to which his life-work is to be carried out, but it is the unfortunate experience of teachers to find that often relatively little permanent benefit has been derived from this early discipline. This results from the hurried way in which the subjects are taken up and dismissed one after the other. When the inevitable examination is passed the knowledge which a student has acquired is often rapidly lost, and there is too little result for the amount of work done. The present curriculum is crowded with disjointed subjects. Some process of conservation is required to prevent the dilapidation of knowledge.

It was formerly the custom of Examining Boards to examine the student, when he came up for his degree, in the earlier as well as in the later subjects of the curriculum. This mode of conserving the student's knowledge has become impossible, but no means have yet been discovered to effect the purpose of this old regulation.

The study of pathology as an experimental science in the final period of the medical curriculum to a certain extent prevents the educational waste to which I have referred. In the recent study of immunity under the guidance of Ehrlich, of the pathology of inflammation as it has been taken up by Metchnikoff, or of cancer as it has been explained by Farmer, we find ready illustrations of the way in which pathology keeps alive in the student's mind this physiological, biological, and botanical knowledge which he has already acquired. The study of pathology might become more valuable in this respect were it possible to teach the student the subject by introducing him directly to research. It is difficult to see how this could be done with the average student. He has neither the time nor the experience required for profitable work at research. Students who take special courses and post-graduate students do find it possible, and it is to them of inestimable value. The case of the average student is to some extent met by practical teaching. This is, however, only a partial solution of the difficulty. Practical teaching lacks the stimulus to spontaneous observation which is characteristic of research, nor does it provide the same incentive to conserve and use the knowledge derived from cognate sciences. The impulse to pathological research arises not only from the intellectual desire to pursue the scientific investigation of the subject, but also from the practical demand for the means to break the power of disease.

The student who masters pathology in all its aspects, and who is able to apply all the learning of the schools in his