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THE TEACHING OF PATHOLOGY.

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IN the course of an introductory lecture delivered on the occasion of the opening of the new Pathological Department at the Owens College, on October 2nd, Professor Delépine said: We meet to-day under circumstances which are of considerable interest and importance. For the first time the new extensive lecture and work rooms which have been provided with wise munificence by the Council of the Owens College for the study of forensic medicine, physiology, and pathology are opened to students and other medical workers. It is not my place to tell you how, through the addition of these new buildings to the medical school, all the departments, besides those I just mentioned, have benefited. It is enough to say that this College offers you now, in all branches of medicine, facilities for study second to none in the empire.

I will only refer to pathology, and I may say at once that it is perhaps in this department that the improvements to which I have just alluded will be most felt. In the old buildings the space at our disposal was very inadequate; now, on the contrary, each branch of pathology is provided with laboratories well adapted to the special studies which have to be conducted in them. I will perhaps help you to realise the importance of these advantages by giving you a general idea of the subject which we have to study together.

Pathology is nothing else than the "natural history of diseased organisms," and as such is a branch of pure biological science, and is based on the same methods of observation and research as other biological sciences. The word pathology means "the science of disease." A definition of disease is not easy to give, but I may perhaps say that it is "a reaction of a living organism to agents incompatible with the normal performance of function." The reaction consists in (*a*) alterations in the functions, (*b*) alterations in the chemical composition, (*c*) alterations in the structure of the tissues or organs of the animal affected. The study of these alterations forms the object of three practical branches of pathology—morbid physiology, very often spoken of as experimental pathology, though experiments are not confined to this branch only; morbid or pathological chemistry; morbid or pathological anatomy, including histology. This subdivision corresponds also to methods of investigation which are quite distinct, though all tending to the same end.

The morbific agents, or causes of disease, form the object of another branch of pathology—etiology. This part of the science has most important practical bearings. Every advance in our knowledge of causes makes prevention and cure more possible. Among the causes of disease which are now known, none are more important than those parasites to which the name of bacteria has been given; to these I should, however, add a certain number of protozoa. Our knowledge of the relations of these micro-organisms or microbes to various fermentations and diseases may be said to be of quite recent growth. Thirty years ago bacteriology did not exist. It is to the remarkable discoveries of the illustrious man whose death science is mourning to-day that we owe the first clear and complete conception of the nature of contagious diseases. The influence of Pasteur's work in medicine is difficult to overrate, for we can hardly in the present day conceive how any true and complete idea of some of the most common diseases could be obtained without any reference to their microbic origin.

As a striking instance I need only allude to what occurred between the years 1850 and 1863 in connection with anthrax or splenic fever, otherwise known as malignant pustule or woolsorters' disease, etc. In 1850 Davaine and Rayer had noticed that in the blood of animals dead of anthrax there were rod-shaped bacteria. They evidently did not in the least realise the importance of this discovery. But after Pasteur had communicated to the scientific world the results of his splendid researches on lactic acid, butyric, ammoniacal, and other fermentations, and had shown the far-reaching meaning of his discoveries, Davaine reconsidered his old observation. In 1863 and 1864, in important communications on "Le Sang de Rate," he came to the conclusion that the bacterium which he had seen thirteen years previously, and which we now know under the name of bacillus anthracis, was the cause of the disease.

In the same way, under the influence of Pasteur and Davaine's work, Villemin, who had proved by a number of careful experiments the contagious nature of tuberculosis, was led to infer the probable existence of a microbe as a cause of that disease. This suggestion was proved some seventeen years later to have been correct by Koch's brilliant discovery of the tubercle bacillus.

Charles Richet has so keen a sense of the influence which Pasteur has had on the development of modern pathology that he feels inclined to divide the history of medicine into two great eras—namely, that of medicine before Pasteur, and that of medicine after Pasteur.[1] This subdivision, I need not say, is not likely to find general acceptance, and may possibly by many be considered a piece of Gallic exaggeration. We are perhaps too much under the influence of bacteriological doctrines to foresee how far they will retain the primary importance which even the most careful scientists attach to them at present.

It is, however, impossible to doubt the well-proved connection there is between the presence of certain microbes and the production of corresponding morbid states; many methods now used for the prevention of disease, based on the connections just mentioned, have yielded such confirmatory and

[1] *Travaux du Laboratoire*, 1893, vol. ii, p. 16.

practical results that bacteriology is becoming daily a more important science in connection with the department of public health.

The practical teaching of pathology has necessarily many aspects. In our new department special laboratories have been provided for the study of morbid anatomy and histology, pathological chemistry, experimental pathology, and bacteriology. These laboratories have been designed so as to make them suitable not only for teaching, but also for research.

It might be imagined from what I have said so far that a complete course of pathological lectures should cover the greater part of medicine and surgery, with the exception of what relates to treatment; but it has been generally accepted that, for convenience sake and in the interest of the student, a course of pathology should deal specially with (1) morbid anatomy and histology; (2) the physiological processes involved in the production of lesions; (3) the nature of the causes of disease.

Billroth has justly said that "an enlightened and refined empiricism is still at the basis of most methods of treating disease;" and, such being the case, you might wonder why so much time should be devoted to the purely scientific side of medicine. A little thought will show that the duty of a medical man does not consist simply in the blind application of rules transmitted to him by tradition. If such were the case we would be still groping in utter darkness.

One of the constant objects of the physician or surgeon is to improve his art. This can be done in part at the bedside by careful observation and comparison of results, but the ideas suggested by these observations can only be tested by anatomical observations and experiments, and it would be hardly fair to use the patients themselves for experimental purposes, however probable the chances of success might be. It is not less important to keep in mind that hypothetical conceptions which are so useful in scientific research are bad—I should even say dangerous—guides in practice until they have thoroughly been tested by careful observations and experiments. From this it is evident that although pathological theories have an important place in the development of medicine, these theories should hardly be the main object of any useful course of medicine considered as as an art. We have had many sad instances in the past of the dangers of theoretical conceptions, and of their blind application in practice, by very great men; and we are not exempt from the same fault at the present day.

But putting aside the philosophical side of the question, I will say that pathology has a most important place in the education of a medical man. Only by a study of this branch may the student hope to realise the field which opens before him in the short time that he can devote to his medical studies.

It is only by having placed before him a systematic and comparatively short exposition of the various processes, whether rare or common, that may be observed in the diseased body (so far as we know them at present) that he may hope to obtain an idea of the probable relations of one form of disease to another. It is only in this way that he can hope to learn rapidly the probable connection between cause

and effect. Such a knowledge must be useful to him in presence of rare cases, or of more ordinary cases with some unusual features. Then, although I have said that it is not wise to depart in practice from the empirical methods established by experience, it is equally evident that a man in possession of a greater number of facts may arrive at more sound conclusions than observers who had fewer facts to compare together.

This course will be divided into three important parts:—

1. General pathology, or more correctly general morbid anatomy and physiology, which deals with the alterations produced by disease in the structure, composition, and functions of the tissues. It is necessary to consider in connection with this part disorders of circulation, and to a certain extent of innervation, in so far as they influence the productions of cellular lesions.

2. Special pathology, which is chiefly concerned with the changes produced in each organ by the morbid processes studied more generally in the previous section.

3. Etiology, which treats of the various causes of disease and of the way they affect the living body.

It has been of late the fashion, in some quarters, to speak with a certain amount of contempt of morbid anatomy. I should, however, advise you to pay special attention to this branch of pathology. Anatomical changes in a great many instances have been the means of attracting the attention of observers to disorders of functions and to causes of disease which would otherwise have escaped their notice. No pathologist would at the present day think, as some of the older medical men did, that anatomical lesions were actually diseases, yet in many instances the nomenclature used at the bedside is still based on that old notion, so that you will constantly hear of patients suffering from cirrhosis of the liver, nephritis, softening of the brain, and unfortunately in many cases the diagnosis cannot go further.

It is only in anatomical lesions that we can at the present day find a solid basis for a classification of the phenomena of disease that will not lead to constant confusion through overlapping of the sections. Whilst during life the existence of a large number of diseases is known by a certain association of symptoms, after death the same diseases may be indicated even more clearly by a certain association of anatomical lesions.

Through morbid anatomy the identification of certain diseases has been made possible long before the actual cause was known. I need only mention tuberculosis as an instance of this. Thoughtful physicians and surgeons have always taken a keen interest in morbid anatomy. The reasons for this are simple:

(1) The symptoms observed during life are often evanescent, and very often not evident at the time when a patient is under observation. (2) Many of the physical signs require considerable technical skill and experience to be recognised and properly interpreted. One observer is not always certain that he hears or feels exactly what another observer has found or felt. (3) Secondary phenomena often obscure the primary lesions. (4) Patients for some reason or other have often a desire to mislead their medical attendant by fanciful stories.

On the other hand, in the *post-mortem* room (1) one has mostly to deal with material or organic traces of disease, which are not liable to become obliterated except under special and definite conditions. (2) The structural changes produced by disease are few in number, and the complete effects resulting from their various combinations can be analysed with a considerable amount of accuracy. (3) The lesions themselves are objects capable of being accurately described and compared one with the other. They can be depicted and even preserved in our museums in such a way that it becomes possible for a man to compare his own observations with those of numerous other previous or contemporary observers.

By tracing carefully the connections between symptoms observed during life and lesions observed after death, the clinical observations of one observer can be compared with those of another in such a way as to leave little room for the disturbing influence of the personal equation. Anatomical lesions give us therefore the best means to compare and check our own observations and those of others; and though pathological anatomy gives but a very limited knowledge of disease, it provides the only firm basis on which to arrange the facts connected with disease.