than permit recourse to the ligature. For such, digital compression will always have great attractions.

This case also suggests whether the older practice of manipulation of the aneurysm with a view to dislodgment of clots might not more frequently be resorted to, at all events in those cases where the disease is situated in the lower half of the body or at the shoulder.

AN ADDRESS

ON

THE TEACHING OF ANATOMY.

Delivered in the Section of Anatomy at the Annual Meeting of the British Medical Association, held in Glasgow, August, 1888.

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THIS is a favourable time for a discussion upon the teaching of anatomy, and this Anatomical and Physiological Section is particularly qualified for the task. Questions of medical education and reform have come to the front, and the position and claims of the science, which is the foundation of medicine and of surgery, and, I might add, of physiology, call for recognition.

Since you have done me the honour to consider me competent to open this debate, I propose, without further preface, to endeavour to indicate some of the questions which are ripe for discussion.

It is an elementary rule of controversy which lays down that terms should be defined and propositions proved. I am fully aware of the danger of attempting definitions, yet, to facilitate this debate, the risk must be faced; and, in the first place, it is necessary to say what is meant by anatomy.

The science of anatomy is of such extent that I propose to limit myself to a branch of it, namely, human anatomy. If by human anatomy is meant a bare account of the physical characters, structure, and relations of the elements which compose the human body, I would maintain that such a soulless thing is unworthy of being called a science.

Science, Lord Bacon says, is the interpretation of Nature. Anatomists have ceased to be content with structure, they also aim at its interpretation. The success of their efforts is witnessed by the history of the great veins, of the genito-urinary system, of the pineal and pituitary bodies, and, indeed, by the history of almost any part of the human frame.

A due appreciation of any of the systems which have been mentioned calls for a knowledge of biology, for they have been, and are being, elucidated with information from every class of the vertebrate kingdom, and I might add, with much from the invertebrata. Besides this, we must add comparative embryology, which is the very soul and essence of scientific anatomy. Nor does this comprehend all. Histology and microscopic anatomy ought to be mentioned; also the art of dissection and of anatomical preparation.

Although in some schools histology has fallen into the hands of the physiologist, it is certainly the province of the anatomist. Perhaps it has been relegated to another department because it is hardly a study for the anatomical room, and requires a separate place where perfect cleanliness prevails, and where special apparatus can be fitted. However, we would think that the physiologists have enough to do with pure physiology. Histology is best taught by an anatomist, and in a room of its own, which forms a convenient adjunct to the anatomical department.

But placing this aside, a very wide extension has already been claimed for human anatomy. Considered as a science and a training, a vast deal comes within the province of its teachers. However, I take it that we are met here to state how much pertains to medicine, and, further, how that which does pertain ought to be taught and by whom. The last would be a most difficult question to discuss. If we look upon anatomy as an independent science, it must be taught by those who devote themselves to it alone; but if we look upon it, as I do, as being ancillary to medicine and surgery, then surgeons and physicians are by far the best qualified to focus it upon those subjects.

It would be improper to assume the province of determining the value of any particular part of anatomy; but, ordinarily, the time allowed by the medical curriculum places a limit upon the amount which can be imparted. Many of us earnestly wish that the time was longer, but until that consummation is attained we must deal with things as they are. It is therefore necessary to make a choice, and it seems rational to choose that which is likely to prove of practical use in medicine and surgery. I do not propose to take account of that sort of anatomical teaching which is circumscribed by the requirements of examining bodies, or, indeed, of particular examiners. It deserves the epithet of "cramming," and ought to be discouraged. It ought to be recognised that an examination, besides being a test of knowledge, is educational, and that the questions which are asked determine the direction in which studies are pursued. Examiners who appreciate this truism do much to improve medical education. I fear we shall never make examinations a test of wisdom or of character.

In our schools anatomy is taught in two ways, by lecture and by demonstration. Concerning the former method I presume to say but little. The more scientific part of anatomy ought, I think, to be the province of the lecturer. The minute details of anatomy are hard to show to the crowds who fill the theatres of prosperous schools; they are perfectly well suited for demonstration to small classes. Such a division of labour merely requires an adequate staff of demonstrators.

As usually lectured upon, human anatomy is an analytical study, and this doubtless accounts for much of its difficulty. Minds which have acquired everything synthetically are at a loss when called upon to unravel the intricacies of the human body, and confronted with a mass of unexplained detail many are discouraged at the outset. The case would often be otherwise if a beginning was made with the simplest problems, and if these were gradually elaborated. As an example of what I mean, let me instance the peritoneum and the relations of the blood-vessels to it. How few ever understand the relation of, say, the splenic artery to the greater and lesser sacs, or how it reaches the spleen. This becomes easy when we proceed synthetically, and show the stomach suspended from the spine by its simple straight mesentery, with numerous gastric arteries passing through it to reach the stomach (Fig. 1). In the next stage the mesogastrium bent,

Diagram 1.—S, stomach; MG, mesogastrium.

with its convexity to the left and its concavity to the right (Fig. 2), and a greater and lesser sac formed. Finally, the spleen

Diagram 2.—S, stomach; MG, mesogastrium.

appearing in the mesogastrium (Fig. 3), and appropriating one of the gastric arteries for its own supply. Nothing now remains but to give new and puzzling names to the various parts of the mesogastrium and of the splenic artery. Similar synthetical methods are applicable to the hepatic artery and to others, and, I might further add, to other parts of the body, especially the nervous, genito-urinary, and vascular systems. Moreover, it may not be out of place to add that synthetical methods of this nature are the clue to fresh discoveries.

Diagram 3.—S, stomach; MG, mesogastrium.

In addition to the more scientific branches of human anatomy, topographical anatomy is peculiarly suitable for being lectured upon; moreover, it has the advantage of being of the greatest and most immediate practical value. Frozen sections have of late years added to the practicability of this branch, and are an excellent method of demonstration. Scotch anatomists deserve great praise for the share they have taken in promoting this branch of anatomy.

Looked at from another standpoint, anatomy, properly taught, affords an admirable training. In the first place, it cultivates the powers of observation in a high degree; and in the second, affords a much-needed opportunity of learning manual dexterity and the use of instruments, and also familiarity with the appearance, texture, and consistence of the different tissues. These can only be acquired in the dissecting-room and by individual exertion. To make anatomy a training of this kind, and to teach students how to learn for themselves, and, I add, to teach them how to learn for the rest of their lives, a large teaching staff is necessary, and an abundant supply of material.

The first of these desiderata is easily achieved; it is merely a question of reward. Adequate remuneration and due promotion procure a staff large enough to teach students how to observe, and also how to learn for themselves. The London schools are well provided with demonstrators, and where proper organisation obtains, each student receives individual attention.

The supply of suitable material is a more difficult problem. In London a student can be supplied with three parts in a winter session, and industrious men occasionally complete the whole body before the end of May. Where an adequate supply is wanting, prepared specimens and diagrams are most inadequate substitutes for dissection. The former may in a trifling degree assist in training the powers of observation, but they leave all the rest undone.

As for diagrams, I cannot help thinking that our philosophers ought to make an addition to the seven material fallacies, and add the fallacy of the diagram. I remember once being asked whether the lesser sciatic nerve supplied the knee-joint! "Why do you ask?" "Because So-and-so says it does!" "Did So-and-so show it to you?" "No; but he drew it upon the slate!" That alone was adequate evidence. Students have ill-developed critical faculties, and whatever enables them, as they think, to learn easily, is popular. Perhaps the most popular of all is the positive, dogmatic, unscientific teacher.

While the matter and manner of teaching have been briefly mentioned, nothing has been said concerning the recipients; but it must be evident that no method of anatomical teaching can be attended with success which has not a due regard for the idiosyncrasies of those who are taught. Sometimes men who have taken honours at our universities are quite at a loss to learn anatomy. Their memories and thoughts seem trained in another groove; they are able to learn by heart, but cannot acquire those

mental pictures which anatomy requires. Such faults as these are soon redressed when their cause has been recognised.

Finally, the hardest part of our task as teachers is done when we have taught our pupils to observe and think for themselves—a task, I confess, hard to achieve, but full of interest to ourselves and highly conducive to their success.

THE VALUE OF NERVE STRETCHING IN LEPROSY: BASED ON ONE HUNDRED CASES.

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THIS paper forms part of a Government report on leprosy in Trinidad. It was undertaken in consequence of some reports from India which have spoken very highly of the value of nerve stretching in leprosy.

Thus Lawrie (quoted by Horsley in Heath's *Dictionary of Surgery*) reports thirty cases in which the operation was done for anæsthesia, and says they were all successful.

Downes also, in a paper read before the Medical Society of London on May 20th, 1886, mentions thirty-two cases of leprosy in Kashmir in which the operation was done. He says that they all were benefited by the operation, and that in some the ulcers healed completely, and sensation was nearly restored to its normal state.

The most probable explanation of the influence of nerve stretching on ulceration, neuralgia, or other conditions seems to be that given by Mr. Marshall in his Bradshawe Lecture in December, 1883, and based on the experiments of Mr. Victor Horsley. The latter has shown that when the great sciatic nerve is stretched, the stretching is observed to affect the sacral plexus, and passes to the roots of the nerves, disturbing the dura mater and shaking the cord through the ligamentum denticulatum. Thus the ganglia of the cord are probably affected, and an excitation of the vaso-motor centres or trophic centres is produced.

I repeated the experiment on the dead body, and found that when the lumbar dura mater was exposed from behind, no movement was to be seen on stretching the sciatic nerve. When, however, a window was cut in the dura mater, a distinct downward dragging of the cord was observed when forcible tension was exerted on the sciatic.

This theory of a shaking of the trophic and other centres seems to me to derive additional support from two observations which I have made during the past year:

1. That stretching of the great sciatic seems to be attended with better results than stretching of such a nerve as the median, which is nearer the periphery.

2. That sometimes after stretching a nerve on one side of the body, sensation appears to be improved on both sides. This would look as if in these cases a greater "nerve-storm" had taken place, the ganglia of both sides being shaken or affected. This of course might depend on various factors, such as greater force employed in the stretching, or looser sheaths or surroundings of the nerves.

I now come to my personal experience of the operation. This is based on 100 operations performed on sixty patients. The particulars of the various cases are condensed in an appendix to this paper, and the whole is summarised in a short table.

It will be seen that the sciatic has been stretched twenty-six times, the external popliteal eleven, the median forty, the ulnar at the elbow eighteen, the ulnar above the wrist four times, and the supra-orbital once.

It will be well to notice shortly the various reasons for operation. I should mention at starting that a nerve was often stretched for more than one reason, such as pain and ulceration, but in the table the most prominent symptom has been taken as the reason for operation—ulceration.

Various nerves were stretched for ulceration in thirty-eight cases. As a rule, more or less good effect was observed, especially in perforating ulcer of the sole. The ulcer in these cases often healed in a few days.

Of course an obvious fallacy here is that the stretching of the sciatic necessitates remaining in bed for some days; so that it is difficult to estimate how much of the good result is due to this