possible. That the central idea should be to give opportunities to the student, and to assist him in the effort which he himself makes.

(3) That medical education should not be directed solely to teaching the medical art, but education in its true sense, the development of the individual, must not be lost sight of.

THE CASE SYSTEM IN MEDICINE.¹

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I wish to speak briefly of three points concerned in the use of clinical records in teaching medicine: The practicability of the method; its value from the point of view of the medical student; and what seems to me its place in a medical curriculum.

First, as to *practicability*. One of the earliest objections made to the use of cases in teaching medicine was that the plan rested upon a false analogy between the nature of cases in law and the nature of cases in medicine. It was observed that historic cases in law have had a definite bearing on the development of legal doctrine. Certain decisions made centuries ago have fixed the law for all subsequent cases of like nature, and from the study of selected aspects of such cases the student can derive for himself the principles of legal practice. In medicine, however, there is not this clear relation of particular medical cases to the historical growth of medical art. We look rather to our fundamental sciences — anatomy, physiology, pathology and therapeutics — for our principles. This difference between the relation of cases to medical doctrine on the one hand and to legal doctrine on the other is at once admitted. But the contention may be strongly held that this relation is not pertinent to the argument in favor of the use of the case system in medical schools. For the only claim made in the argument is this, — that requiring the student to do, so far as possible, the practical work of the doctor while in the medical school is very much like requiring a student to do the practical work of a lawyer while in the law school. In both instances the students deal with the problems presented by actual cases, and in a most natural manner increase their power by their own activity. It was this analogy between the possibilities of individual effort on the part of the students that pointed to the applicability in medical instruction of a method which has proved of such great value in the teaching of law.

The idea of using printed records of cases as centres of interest in studying medicine occurred to me some two years ago. Since that time I have been watching carefully for every possible opportunity to apply the method, and have tried to see all the objections which might be raised against the plan. It was only when I was fully convinced that a study of real histories could be made feasible in teaching medicine that the scheme was brought forward. The first case studied under the system was given out by Dr. G. L. Walton to a small class in neurology last December, and it revealed at once the usefulness of the plan. In January Dr. J. J. Putnam gave out printed cases in his course in neurology, and since then Dr. Richard C. Cabot, Dr. J. William White, of Philadelphia, and

Dr. C. E. Riggs, of the University of Minnesota, have put the method to test. So far as I am able to learn, there has not been the slightest difficulty in applying the plan, and its practicability in the study of medicine can be stated, I believe, as fully and successfully demonstrated.

The *value* of the case system in medicine has also been remarkably demonstrated in these last few weeks. Many advantages over the didactic lecture and the recitation system were claimed for the case method, but the peculiar merits claimed for it were the arousal of student enthusiasm and interest, the easy possibility of correlating the scientific and clinical sides of medicine, and the drilling of the mind in judging medical data. Not only have these claims been verified, but new merits, unforeseen, have presented themselves. In speaking of these matters I shall restrict myself to statements of personal experience in the exercises conducted by Dr. Richard Cabot, and to student testimony regarding these exercises. The interest which the application of the method has aroused among the members of the present graduating class in the Harvard Medical School is especially gratifying. The exercises at which these cases are discussed have the largest regular attendance of all clinical exercises in this last half of the fourth year. Again and again I have heard students say, "Why could we not have had this way before?" They attend the conferences faithfully, they state to those who are engaged elsewhere that they are missing much by not coming, they dispute and question not only one another but their instructor, they are kept alert and keen-minded throughout the whole discussion. "Conference maketh the ready man," and this is one of the chief characteristics of a good physician — he is a ready man. Yet there is nothing in listening to lectures that tends in any way to develop this valuable trait in the medical student.

Another matter which the students are learning is the judgment of clinical data, the estimation of the value of evidence. In the text-books symptom after symptom is written down, without indication of importance or weight. In considering a particular case and discriminating between the various diseases it might represent the students first begin to see what may be called the perspective of symptoms, and learn to distinguish between the important and the unimportant, the common features and the more unique.

Among the new unforeseen merits characterizing the case method is the discovery that the particular instance may be stated so vividly that it will leave in the mind a picture quite as definite and lasting as the sight of a real patient. This virtue suggests the especial use of the method in teaching the management of acute, urgent conditions, — such as alarming hemorrhages, the agonizing distress of angina pectoris, and the cutting, stabbing pains of biliary colic, — conditions which we students never see in the hospitals, and which we may be called upon at any time to treat. A simple case given out for discussion during the last ten minutes of the hour, about a week ago, will illustrate the point.

A middle-aged man was seen writhing in intense pain referred to the epigastrium. Vomiting of greenish fluid took place; there were loose discharges from the bowels, small in amount. This state of things lasted, with only short remissions, for two days, until a small dose of morphia, which, for special reasons,

¹ Read at a meeting of the Boston Society for Medical Improvement, March 5, 1900.

had been hitherto withheld though asked for, was administered, after which there was complete relief for many days. The pupils were dilated, the pulse regular and of normal character. Nothing special had been eaten or drunk to cause irritation of the stomach. The abdominal walls were neither distended nor retracted, no intra-abdominal tumor was to be detected, nor was there any excessive tenderness on pressure. It was afterwards learned that he had had several such attacks, that for many months or years his legs had been weak, that he had neuralgia and numbness in them, that he stumbled in walking and staggered with his eyes shut.

Here we have a real and vivid description of a gastric crisis in tabes, made so striking that it leaves a deep and permanent impression in the memory. This case also illustrated another of the unexpected features of the case method, that of showing to the students themselves and also to their instructor what they do not know and wherein their knowledge is inaccurate. At the end of this record of a gastric crisis the question was asked, "What further examination would you make?" This one question alone showed about one-half the students present that they were entirely wrong in their memory of the Argyll-Robertson pupil, and the question further showed that a large number of the graduating class believed that the knee-jerk was ordinarily increased in tabes. These are merely instances of the state of affairs among the students which the method is bringing to light. They are going through their last year in the school ignorant of their ignorance and complacent in their false knowledge until meeting the actual conditions of real cases shows them their deficiencies. It is not to be expected that the lecture system will reveal to the students their faults. How can it do so? The students sit passively listening to their instructor; the instructor does not know whether they have understood, or learned, or are remembering; his chief knowledge of the students is derived from what they write in a blue book after cramming their minds for a few weeks with what he has told them during a whole school year. In the complexity of medicine what can such a test show?

Another merit which the actual employment of the case system has developed is the training which students get in being required to adapt themselves to actual difficulties in practice. The first case presented under this method was at the time in the private practice of the instructor, Dr. G. L. Walton. The diagnosis of cerebral hemorrhage was made by the students and the probable site of the hemorrhage located. The instructor then put the practical questions which he had had to answer for the family: "Will you allow the patient to sit up in bed? Why will you forbid him to sit up? What will you give him to eat? Does he need drugs? What will you do for him? What is the prognosis with such a past history? His wife is a nervous, imaginative woman who will worry herself to a wreck if you are not careful. What will you tell her about her husband?" All of these questions the students were compelled to answer and to give reasons for answering as they did. Now, does it not seem reasonable to suppose that by requiring such exercise of thought, and discrimination and circumspection of all the data, students are trained to greater power in studying their authorities and in increasing and applying their knowledge and in using

their judgment than could possibly be the result of idly listening to lectures?

Finally, I wish to state from the student's point of view the apparently proper place for such a method in a medical curriculum. In the argument for the adoption of the study of case histories in medicine, a sharp distinction was drawn between the two attitudes of the physician. His first work is that of the observer; he must secure his data thoroughly and skillfully, and this work is fundamental. The only adequate training for such observation is actual contact with human beings—a training which Dr. Wentworth's plan of section teaching admirably provides. But there is the other attitude of the physician, that of the careful judge who regards his data on all sides, relates it to his previous knowledge, makes his differential diagnosis, has his reasons for his prognosis and applies his rational treatment. Now, it is just this central position between the scientific work of the first two years of medical training which provides principles and theories, and the practical work of dealing with actual problems that the study of data provided in printed cases will have its greatest value. At the clinics the students are drilled by their corrected efforts to be thorough and discriminating in their observation, and thus to secure reliable clinical data—the emphasis here is on observation. At the clinics, however, the time is not sufficient to consider these cases in all their details. This defect the case method makes good; for with the printed records in their hands the students are drilled by their corrected efforts to judge with care exactly the same sort of reliable data which their own observation has secured. The cases can be so arranged as to develop naturally the relations of the group of diseases under consideration, and the similar diseases between which distinction must be made. To these cases the students can bring all their knowledge of anatomy, physiology, pathology and therapeutics, and these subjects, which are now more like separate packets in the mind than related parts of a single system, take on a new importance and interest. The students thus fix their knowledge by unifying it, by bringing the new information into relation to that already secured. They learn the use of their authorities as books of reference, and they must study their matter from day to day, for judgment and reasoning and skill in analysis cannot be crammed in the few weeks before an examination; and finally, all this discipline has a direct value for the bedside instruction, pointing out to the student what to watch for, showing him the importance of complete examination, and teaching him how to interpret observations as they are made.

It seems to me that such a plan presents conditions worthy of an instructor with the widest knowledge of both medical science and medical practice, one who is keen and ready and accurate. In his close relations with the students in the conferences he occupies a position of far greater importance than lectures can possibly give him in securing the knowledge and skill and in determining the ideals of young men who are looking forward to the work of the physician.

A NEW INVESTIGATION OF YELLOW FEVER.—It is reported in the *Philadelphia Medical Journal* that the Liverpool School of Tropical Medicine is soon to send a commission to Brazil for the purpose of studying yellow fever.