LABORATORY AND CLINICAL METHODS.

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I have selected as my text a statement made by Francis Bacon: "Some dispositions evince an unbounded admiration for antiquity, others eagerly embrace novelty; only a few can preserve the just medium, and neither tear up what the ancients have correctly established, nor despise the just innovations of the moderns."

Whether it is true to the extent that many would have us believe, it is certainly true that there are not a few who think that the art of diagnosis has suffered with the introduction of scientific tests performed in the laboratory. Stokes (Modern Clinical Syphilis, 1926), for example, states that clinical and laboratory diagnoses in medicine are too often spoken of as maintaining a species of tacit rivalry, not to say antagonism, toward each other. This attitude may be explainable in part to the fact that when the laboratories came along they were captured in an educational sense by clinical medicine, but they have now captured their captor. A more logical explanation is that suggested by Stokes, namely, that it is at all times still difficult for the physician, sharing the common desire of human nature for touchstones and open sesames, to realize that syphilis, or for that matter any disease, will never wholly yield to a single diagnostic key. While no one will deny the positive need for systematic use of certain laboratory tests, amounting in fact to routine application in certain aspects of disease, the diagnostician, as Stokes insists, should never forget that the substitution of a mechanically ordered test for a frame of mind, results in some of the poorest diagnostic work in medicine. For all its value, any procedure which substitutes a test tube reaction for a primary acuteness of perception debases the clinician and costs him often in the end more efficiency and self-respect than its accuracy and easy accessibility can ever justify. It is this tendency that has led to the loss of respect for clinical as compared with laboratory evidence.

The multiplicity of accessory diagnostic aids has produced the same confusion that besets modern thought in all fields. As Durant has expressed it: "Our modern danger is that we suffocate with uncoordinated facts; our minds are overwhelmed with sciences breeding and multiplying into specialistic chaos for want of synthetic thought and a modifying philosophy." The modifying philosophy needed in medicine is that physicians cease to enslave themselves blindly in the use of any of these routine aids. They should be inspired, as Stokes puts it, to recanvass and furbish up their clinical acquaintance with disease. In no other way, I take it, will the two methods be made complementary to each other. It is just as essential to have a proper understanding of the limitations of the necessary diagnostic aids as it is of the shortcomings of clinical evidence.

It is hardly necessary to remind you of the debt we owe to Sir James MacKenzie in advancing our knowledge of cardiac disease. Recalling that he was what is commonly called a "country practitioner" and that much of his work was based on mechanical aid, it is interesting to note his conception of what clinical medicine should be: "The advances that have been made in special branches, particularly those pursued in laboratories, and by the use of mechanical devices, are all reflected in the field of clinical medicine. In an attempt to be up-to-date, physicians use the methods of these auxiliary branches, so that clinical medicine toils laboriously in their rear, and to a great extent becomes subservient to them. It should be realized, and should be strongly and persistently insisted upon, that all these special methods fall far short of the ideals of what is wanted in clinical medicine, and that the pursuit of clinical medicine involves problems, peculiar to itself, which none of these methods can ever hope to solve. There is not a single mechanical or laboratory method ever introduced but has had an extremely limited sphere of usefulness. Time and again great expectations have been raised on the announcement of some wonderful discovery that was going to have a revolutionary effect upon clinical medicine, but in every case, as time went on, when its sphere of usefulness came to be recognized, it was found to be a very limited one. The impression that the results obtained by a mechanical method are more reliable and scientific than those obtained by the use of the unaided senses, is but a belief based on a

false analogy. It is assumed that because the experimentalist obtains certain records which are capable of demonstration these are of more value than the information derived by the doctor from questioning of his patient, or by the use of his own senses trained by long experience. Those who reason thus unconsciously compare unequal things. In laboratory experiments it is impossible to obtain any information from the great field of subjective impressions. In man this is the most important field and far outruns the field of mechanical exploitation in giving us information as to the nature of disease. The laboratory worker obtains his results by a mechanical contrivance. The physician has to train his senses, and this can only be done by a long process of education, only capable of being acquired by the constant contact with the patient."

In speaking of the early physicians in India in the eighteenth century, Sir Leonard Rogers pays the following tribute to their powers of acute observation: "That writers who lived before the days of modern microscopes, or even temperature charts, should have been able to classify and describe the fevers of India to the extent they did, teaches a valuable lesson in these days when clinical studies are at a discount." It is also of interest to those of us who are but slightly familiar with tropical diseases, and which most of us regard as curiosities requiring special diagnostic technique, to read in his introduction to "Fevers in the Tropics" that Rogers has been led by his researches to conclude that a large proportion of fevers in the tropics can be diagnosed within two or three days by purely clinical methods. It will thus be possible in the remaining doubtful cases for a microscopical examination of the blood to be made as a matter of routine, and a clear idea to be got of all fever cases, whereas, under ordinary conditions of work in the tropics time does not permit of the use of the microscope in every case.

This, it seems to me, is the crux of the situation. Many physicians, particularly those practicing in small towns and in rural communities are, for the most part, unable to avail themselves of many of the modern scientific aids to diagnosis. We all realize the value of many of these accessory aids, and we take it as a matter of course that a well-equipped metropolitan hospital makes use of the electrocardiograph, for example, in further elucidating the cardiac aryth-

mias. Is this, however, necessary as a routine measure? According to Sir Thomas Lewis, it is not. As he has shown, careful attention to the clinical phenomena makes it quite possible to recognize all but a small proportion of these cases.

Diagnostic problems, for the most part, fall into three groups. There is, for example, the group in which a correct solution is dependent entirely on the presence of one or more of the special tests. This group is, I believe, much smaller than most physicians think. In many cases the recognition of a diseased condition is credited to a laboratory method, when as a matter of fact it should have been detected by clinical methods had these been used intelligently. Thoracic aneurism occurs, to my mind, as a notable example of how an obvious condition can escape notice as the result of slovenly clinical methods. I have seen patients with thoracic aneurism who have gone from dispensary to dispensary without their trouble being recognized for the want of a careful glance. I do not wish to be understood as insisting that the methods of physical diagnosis alone will invariably recognize all thoracic aneurisms. I do believe, however, that clinical methods will detect the great majority of such cases and that, at least, a suspicion of the existence of the trouble may be obtained in most of the remainder. One can have little sympathy for the humiliation of the clinician who is confronted with an X-ray film showing a large tumor mass in a patient in whom he has failed to notice the slight bulging of the sternum, pulsation, unequal pupils, and dullness on percussion, or to have failed to take heed of the subjective pressure symptoms.

By far the largest group seeking diagnostic aid is that composed of patients in whom the source of their trouble is quickly apparent, or is brought to light by careful history-taking and physical examination. I would cite a disease with which I have had some experience, namely, pulmonary tuberculosis. In the great majority of patients suffering from pulmonary tuberculosis, irrespective of the stage, clinical methods, plus examination of the sputum, serve to recognize the trouble. Making a rough guess, I should say that the man who has a reasonable familiarity with the natural history of this disease, its pathology and its symptoms, should arrive at a correct conclusion in at least ninety of the cases he sees. There will always remain a

small group in which every known method will be needed to establish a diagnosis. Of all the necessary aids that have been introduced to facilitate the recognition of pulmonary tuberculosis, the only ones, as Baldwin (DeLamar Lectures, 1925-1926) has pointed out, that thus far have been of any value in diagnosis are: the demonstration of tubercle bacilli, tuberculin tests, and the complement fixation test. In the diagnosis of syphilis and cardiac disorders, this same view is held by Stokes and MacKenzie, whom I have already quoted.

Finally, there is that large group that Peabody has recently described, "Patients who have nothing the matter with them." If what may be termed the "laboratory group" is much smaller than is usually thought, this group is far larger than most physicians appreciate. When I was a medical student, if one had the temerity to ask what the treatment should be, he was put off with the answer that that was of secondary importance. Diagnosis was the all-important thing. Once you had the diagnosis the proper treatment followed as night follows day. In common with many another young practitioner, I finally learned that it is quite possible for people to suffer from ill health of varying degrees of severity, and which in some instances amounts to almost complete disability, without the presence of an organic lesion.

It is in this group that the human element plays such an important part. As Peabody has expressed it, in patients whose symptoms are of functional origin, the whole problem of diagnosis and treatment depends on the physician's insight into the patient's character and personal life, and in every case of organic disease, also, there are complex interactions between the pathologic processes and the intellectual processes which he must appreciate and consider if he would be a wise clinician.

Far too many physicians, once they have eliminated the possibility of organic trouble, lose interest or are apt to assume that inasmuch as no anatomic lesion exists, the symptoms will eventually disappear. They fail to appreciate that while the symptoms have no anatomic basis, they are none the less disturbing and distressing, and there is nothing imaginary about them. A pyloric spasm, for example, due to disturbance of innervation—in my own case always brought on by fatigue—is just as distressing as one due to a duodenal ulcer.

It is comforting, of course, to know that a serious organic lesion is not the cause of the trouble. But it is discouraging, to say the least, that no suggestion is forthcoming as to what will relieve the condition.

If the clinical side has allowed itself to become subservient to the laboratory in matters of diagnosis, there can be no question that it retains its supremacy in the field of prognosis. Expressed in a homely term, clinical experience remains our sole reliance in determining how sick a man is. Men with wide clinical experience possess that intangible something—a sixth sense, as it were—in being able to gauge the severity of an illness. Disease rarely manifests itself in the same guise in every individual. To know that a certain disease is present, however important from the diagnostic standpoint, fails to tell the whole story. Stokes has emphasized the point that "The soil (or the host) so often forgotten in clinical reckonings, is no less important than the seed (or infecting organism)." An uncontrollable or undefined adventitious influence, such as the time factor, or the activity of the physiologic defense, may set aside the cleverest prognostications and the best laid plans. Furthermore, as Peabody has pointed out, disease in man is never exactly the same as disease in an experimental animal, for in man the disease at once affects and is affected by what we call emotional life.

It is this phase of the clinical art that requires prolonged and intimate contact not only with disease, but with people suffering from disease, particularly the latter. In no other way can the physician come to have an appreciation of the almost infinite variations of the same disease as it manifests itself in different people. It is experience of this kind that enables the trained clinician to foretell that A will recover and B will probably die within a few months, when to the novitiate one or the other of these things should occur to both.

I believe that a better understanding will be forthcoming if this problem is attacked at its source. Medical students should be taught the basic facts in the recognition of disease. Dr. Wilbur, President of Stanford University, in a recent article on "Altering the Medical Curriculum" states, that admitting the enormous service the laboratory has been to medicine, a disproportionate part of the student's time is taken up for such courses. In his judgment, "Aside from the essential laboratory technique, it is more important that a student

should be trained in all the various methods of physical examination and in accurate observation and deduction, than that he should be trained in refined laboratory technique." The student is too often fascinated with the unusual method. To him it seems much more scientific and up-to-date to repeat the findings of some test or mechanical procedure than to give the evidence obtained by his own unaided senses.

What Provost Penniman, of the University of Pennsylvania, has said about a cultural education holds true in the teaching of medicine. We should make sure, as far as possible, that students have a well-rounded education in the humanities before they begin to concentrate on specialties. The fault of specialization is its tendency to over-refinement. "Too brilliant a light is turned on too small an object" and the methods are too refined for the beginner.

The student who is striving to familiarize himself with the basic facts of medicine gets a false idea of the value of special tests and specialties, and he too often carries this with him when he enters the practice of medicine. As a result, far too many physicians act as middlemen. They simply direct the patient to a specialist or specialists and from them require a diagnosis. Such a procedure is frequently necessary and is often imperative if the trouble is to be ferreted out; but as a more or less routine method it cannot be condemned too strongly.

If clinical medicine is to retain its place it will be through those who "can preserve the just medium, and neither tear up what the ancients have correctly established, nor despise the just innovations of the moderns."

DISCUSSION.

DR. CHARLES L. MINOR, Asheville, N. C.: I am sure we all enjoyed Dr. Landis' frank paper thoroughly, though in these days of the dominance of the laboratory, I am afraid his is a voice crying in the wilderness. We owe the Germans a great debt for much of the splendid work they have done in research medicine, but unquestionably they have been responsible for the marked decline of attention to careful bedside work, and personal attention to the patient and interest in him as a human being. This was true in 1891, when I worked in Vienna, and I saw it again this year in Munich. To these Germans a case was merely a case and not a human being, and however fine the triumph of scientific medicine it will never be of its full use until the patient is considered as well as the disease.

I was delighted to find in Paris the straight clinical bedside medicine still practiced and that the relation between the patients and the doctors is cordial and kindly and compares very favorably with the German handling of a patient, which lacks heart. In Paris the laboratory was not neglected, but it did not preponderate or cause them to neglect the individual. In America we have followed the German lead too much, and I trust that we are going to come back to a more rational procedure.

There was a period of English domination in the medical world with great clinicians. Then the French under Laennac and Louis took the lead, but for a great many years now Germany has unquestionably dominated, and while she deserves all praise for what she has done in medicine her work has been one-sided. Let us hope that there is now going to be a period of American domination, and that it will be marked by a combination of the science and the art of medicine which we need so much.

DR. ALEXIUS M. FORSTER, Colorado Springs: I think the most shining example illustrating the need of a paper such as the one Dr. Landis gave us is the slovenliness of the nomenclature describing diseases and signs in the chest. As I look over the literature and see the carelessness in describing breathing, and in describing physical signs, I come to the conclusion that the clinician should be more careful in the use of his description. While we may not agree with all of Dr. Landis' interpretations in describing pathology as given in his book, I think we can all admire the detail he gives in describing the signs; and when the X-ray men look for interpretations in pathology and leave out physical signs, they present a shining example of what Dr. Landis has given us in his paper.

DR. HARRY A. BRAY, Ray Brook, N. Y.: I am in sympathy with bedside observation, but I still feel that the student today is very much ahead of the student of my time, and I think his attitude is a correct one. You take the time of Laennec—What did the student do in differential diagnosis? You read the French and German literature, and you come to only one conclusion. Pulmonary tumor and bronchiectasis and pulmonary tuberculosis were confused, and it was only at the time the tubercle bacilli were discovered that the differentiation was made.

I don't agree with Dr. Landis. Of course, the examination of the sputum is an elaborate procedure, but if he removes that from the methods of diagnosis, a correct diagnosis will not be made in 90 per cent of the cases, but the per cent will be much lower than that.

Following the discovery of the tubercle bacilli many cases escaped our discovery until the advent of the X-ray. The student is taking the right course in the path he selects, for I have no doubt it will lead him much further than it has led us.

DR. WILLIAM LEROY DUNN, Asheville, N. C.: I am particularly glad to hear Dr. Landis read a paper today. I think there is really nothing we need more than what Dr. Landis has said. He has a more sympathetic audience in the men assembled here than in a young audience. We represent men who

have gone through the failures of medicine. We went through the phase when the laboratory was beyond us, and we recognized the limitations of the laboratory phase, and it is with gratification that we are coming back to the clinical phase.

I want to take exception to what Dr. Bray had to say. He spoke more about tuberculosis, but he emphasized something Dr. Landis said, and that is that the careful study of the patient, the careful gathering of the history is infinitely more important than anything we can do for the patient. The vast majority of cases can be diagnosed by a careful history without physical and laboratory methods. I trust Dr. Landis' paper gets an audience among younger men where it is needed today.

Dr. Robert Wilson, Charleston, S. C.: I, too, want to express my appreciation of Dr. Landis' paper. There is no doubt that in recent years the tendency has been to lay too much emphasis upon laboratory work to the neglect of careful clinical observation, which may be quite natural in view of the great value which the laboratory findings undoubtedly possess. But in our reaction against this tendency we must not go too far in the other direction and minimize the value of the laboratory. The student should be taught that laboratory findings are supplementary to the data obtained by the use of his sense at the bedside, and especially must be taught to use his brains in correlating and evaluating his findings. Analysis and reflection are as essential as observation.

With reference to the comment of Dr. Gordon Wilson I am reminded of an experience which I had some years ago. A recent graduate of a large university medical school consulted me about settling in Charleston. In the course of our conversation I asked about the teaching of therapeutics in his school. His reply was that at his school they did not pay much attention to therapeutics. "When we make a diagnosis we are through."

Dr. F. M. Pottenger, Monrovia, California: I wish to thank Doctor Landis for discussing this subject before our society. I think his is one of the very important papers that have been presented here. There is no doubt that we as clinicians have been losing the keenness of the older observers when it comes to studying the sick. Instrumentation is easier and, unfortunately, we are taught that it is more accurate; so we have been gradually learning to depend for our diagnoses upon data which fail to take the individual patient into consideration.

In dealing with the individual as he is affected by disease, we are dealing with a double organization—a physical and a psychic. One can never see the psychic fully in any instrumentation or in any laboratory test; but one can see it in clinical observation. Neither do laboratory tests explain the many vagaries due to nerve and endocrine imbalance which are evident to the practiced observer. Clinical observation should be cultivated, and every physician should study his patient through observation, and the usual methods of physical examination before instrumentation. I never use the X-ray or any

other laboratory method of examination in my chest work until I have determined what I can by clinical observation.

Another important subject discussed by Doctor Landis is that of the education of medical students. Medical education, as carried out today, is an injustice to both the student and the layman upon whom he is expecting to practice. We are supposedly preparing our young men for the care of sick people. In the hospital the student is studying advanced disease and typical cases of the more definite and often difficult types. The young man gets a faulty conception of medicine and expects to see things as they are in the hospital; but when he enters upon practice he does not see the typical hospital case, nor does he see it under hospital conditions. Much of his teaching also is done on charity cases; but he finds in practice that there is an art in medicine, and that it is necessary for him to understand and please the patient as well as render service, if he is to be successful.

Another serious defect in medicine today is the manner in which it is specialized. One man specializes on the eye, another on the heart, another on the kidney, etc, with too much of a tendency to forget that these organs belong to individuals, and that no organ or no disease can be understood except in its relationship to the entire being. One of the greatest needs in medicine today is the evaluation and correlation of the information and the methods of studying the sick, which have been brought forth during the marvelous advances that have been made in recent times. We must also educate our students to care for the sick, and render service to a sick individual as well as to diagnose and treat a disease. Nothing will help them more than teaching them close observation of the individual and the way in which they can see departures from normal. No matter what laboratory and mechanical methods are used in practice (and they should all be used) observation and study of the patient must always be considered the basis of clinical medicine.

DR. GORDON WILSON, Baltimore: I believe Dr. Landis' paper is a very valuable one, but I differ from Dr. Minor, and believe that the pendulum is swinging back with benefit to humanity.

I do not think that the first thing to do it to try to make an etiological diagnosis, but the important thing is at first to make a therapeutic diagnosis, and later to decide on the etiological one. To illustrate this I recall a story told me by a well-known surgeon of Baltimore, about two physicians in near-by towns, who referred patients to him. One generally sent his patient in with fairly correct diagnosis as to whether the condition was appendicitis, pelvic inflammatory disease or some other surgical condition of the abdomen, but this man's patients as a rule arrived too late to be benefited by surgery. The other man rarely went further in his diagnosis than stating that the condition was one requiring surgical interference, but his patients almost invariably were operated upon and lived.