An Address

ON

CLINICAL RESEARCH BY THE FAMILY DOCTOR.

DELIVERED AT THE ANNUAL MEETING OF THE ABERDEEN
BRANCH OF THE BRITISH MEDICAL ASSOCIATION,

BY

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THE position in which the doctor is placed immediately after graduation is really the outcome of the progress of medicine from the earliest times down to the present day. It has taken centuries for the healing art to emancipate itself from superstition and the thralldom of authority. The reformation began on the day in the second century that Galen boldly, almost insolently, cast aside the old commonplaces of authority, tradition, and general consent, and put his finger on the pulse with the intention of trying to predict from the variations in its beat the course of the disease from which a patient was suffering. Here was the dawn of a new era in medicine, and from that time onwards the physician became a clinical observer. He had, however, nothing to help in his work except his highly trained senses and a mind stored with the results of his past experience.

As the centuries passed advances were made from time to time by men who were pioneers in their own day and generation, but the great awakening came when Virchow, about the middle of the nineteenth century, attempted to systematize all previous knowledge by his doctrine of cellular pathology. His work was epoch-making, and its fundamental importance was quickly recognized. Its keynote was the thorough study of the structure of the organs of the body; the science of pathology gradually developed, and its discoveries had a profound influence on the practice of medicine. Laboratories were built, and laboratory technique became greatly improved, and the practical application of morbid anatomy to clinical medicine resulted in the discovery of physical signs, by means of which the physician was enabled to discover evidence of organic disease in the living subject. Definite objective evidence now in great measure took the place of the study of symptoms, and led to a classification of diseases based on *post-mortem* appearances. Structure, therefore, was thought to be of more importance than function, and the end-results of disease were minutely investigated, while its causation and its early stages were relatively neglected. Intense microscopical examination of pathological specimens was the order of the day, and led to the discovery of micro-organisms. The nature of those minute forms of life, and the part they play in the causation of disease, were now eagerly discussed, and research workers were attracted from the study of alterations in structure to the investigation of disorders of function.

Physiology now came to the forefront, and was recognized as the only basis on which scientific medicine can rest. What may be called the descriptive stage of medical study was gradually superseded by an experimental stage. Laboratories and laboratory methods were again greatly extended, numerous instruments of precision were invented, and the activities of the pathologist were no longer confined solely to the *post-mortem* room. He took a share in the examination of the patient and called himself a clinical pathologist. In those early days of the study of disordered function the physician and the clinical pathologist were frequently combined in one person. That was a very satisfactory arrangement, but it did not last long, because as methods of examination became increasingly complicated the pathologist tended more and more to isolate himself in his laboratory and to lose touch with the clinician. He also began to bring to the solution of his problems the spirit and the methods of research in the exact sciences. His ambition was to make his observations definite and unambiguous, and so it came about that the clinician, oftentimes worried and disappointed by his failures at the

bedside, became tempted more and more to appeal to the laboratory worker to provide him with a test which would give a short cut to diagnosis. This passive attitude on the part of the clinician led to the assumption of a rather aggressive attitude by some laboratory workers, who claimed that all research for the advancement of medicine ought to be left in their hands.

As a result of this unnatural distinction between practice and research the methods of the clinician, through which so much had been achieved in the past, tended to fall into the background. That was a retrograde step, because the true aim of all medical research is to reconcile the results of laboratory examination with the clinical symptoms. Much purely laboratory investigation has failed for want of clinical direction. It is true that phenomenal results have followed experimental research, but it must not be forgotten that some of the most notable achievements in medicine have been accomplished by men whose life was spent far removed from laboratories or seats of learning. Take four examples: Harvey was an obscure physician struggling to make a living when he first began to think of the circulation of the blood; Jenner, amid the worries and vexations of a country practice, discovered vaccination; Koch was a district physician when he began his investigation on tuberculosis; and Mackenzie was a busy general practitioner when he laid the foundations of his epoch-making work on the heart. The best progress is likely to be made when clinician and laboratory worker pull together, each realizing the difficulties of the problem constantly encountered in general practice, and both determined that those difficulties shall be solved as a result of their mutual efforts. Some pathologists who have been trained wholly in laboratories are quite ignorant of the problems which confront the general practitioner in the course of his daily work. They are impatient of clinical observations, which they say are wanting in scientific precision, but they are only too easily led astray by the apparent exactitude of physical and chemical formulas.

When dealing with living tissues one cannot depend wholly upon rigid mechanical fidelity; formulas cannot be applied in the expectation that the result will be obtained with strict mathematical precision; there is not a rule and a measure in all things. Pain cannot be measured by any instrument of precision, yet it is one of the most valuable symptoms of disease. The true value of the laboratory in the study of clinical medicine is enhanced rather than lessened by a frank recognition of its limitations.

Although there is no reason to think that the principles by which medicine is governed are materially different from those governing other arts and sciences, yet the methods of the sciences allied and ancillary to medicine cannot be applied without certain reservations. The problems of disease are more complicated and difficult than any others with which the trained mind has to grapple. Each individual case presents its own problem, and therein has its special interest. Nature is constantly performing experiments in the laboratory of the human body, and although the reactions, the results of those experiments, are far too delicate to be measured by test tube or balance, yet they are revealed by the occurrence of symptoms.

The methods of research in clinical medicine are therefore peculiar to itself, and the kind of knowledge necessary to detect the earliest symptoms of disease can be best cultivated by the general practitioner, because it is he alone who sees disease in its initial stages. It was for that reason that the late Sir James Mackenzie founded the Institute for Clinical Research in St. Andrews. He insisted that it is only the general practitioner who has the opportunities for clinical research into the early stages of disease—that is, before the patient's disability is sufficient to take him to hospital. He, and he only, has the key enabling him to recognize disorders while prevention is still possible.

Many of the great teachers of the past were to all intents and purposes general practitioners. Laboratory methods were unknown to them, and they possessed few instruments of precision, but they studiously cultivated their own powers of observation, and taught their students how to use their unaided senses. The neglect of this form of education renders the medical student of the present day less self-reliant in diagnosis and prognosis than many

of his predecessors. What has been gained, therefore, in one direction has been lost in another.

Mackenzie firmly believed that the family doctor could do as much to advance the science of medicine as any worker in a laboratory, and the goal of his ambition was to find ways and means to enable him to become a research worker. The idea of founding an institute for clinical research had long been present in his mind, and when the opportunity came he left London at the very zenith of his fame and settled in St. Andrews. He realized that his plans, as he conceived them at that moment, could only be carried out in a town of small size with a comparatively stationary population. In a letter which he wrote on the day before he died, he says:

"When I left London I dared not tell anyone the real reason of my leaving, for it would have been looked upon as a piece of folly. For years I had been gradually becoming convinced that the whole tendency of research was on wrong lines: it was devoid of fundamental principles, was haphazard, and could not supply the kind of knowledge which would enable us to solve medical problems. It was with the object of searching for this principle that I undertook, at the age of 65, the burden and responsibility, which were very heavy, of starting an institute for the purpose of this quest."

So it came about that the James Mackenzie Institute was founded in St. Andrews. For five years it enjoyed the immeasurable advantage of Mackenzie's presence and direction, and his great and forceful personality dominated its work. The general practitioners of the district gathered round him, and week after week they sat down together to discuss problems of far-reaching influence on the progress of medicine. He spoke to those family doctors like an elder brother, and all felt that to be associated with him was both an education and a revelation. His teaching has opened a great and unforeseen road in clinical medicine. He ever insisted on the habit of accurate observation, and while not fond of controversy for its own sake, or even contradictory, he was ready at all times not only to defend vigorously the exactitude of his own work, but combative and eager to fight in defence of his own opinions. His writings are all based upon his own carefully recorded observations. He always insisted that departure from health is made manifest at its onset by sensations experienced by the patient, and that failure to detect disease in its earliest stages is due to the fact that the patient's sensations are not systematically investigated.

With rare sagacity Mackenzie formulated certain principles underlying the production of symptoms, contending that in medicine, as in physical and chemical science, although the phenomena of disordered action are many and varied, the causes underlying their production are few. He founded his institute to develop those principles, to put them in practice, to test their accuracy, and modify them in the light of experience. He was never satisfied unless he was testing constantly and improving in detail. He had no sympathy with those who never change their mind, and, far from apologizing for inconsistency, he would denounce consistency as an evidence of mental sterility and an attribute of those who have no mind to change. Nevertheless, although he might be ready to admit that he was wrong on Monday he would be equally positive that he was right on Tuesday, and if called upon to argue in favour of his opinions he always spoke with intense conviction.

There are many who believe that the secret of progress in medicine is to be found only in the laboratory, and choose that walk in life rather than engage in general practice because they consider that it is the only way to study medicine scientifically. The scientific spirit, however, is not the exclusive property of the laboratory worker. It is inborn in the individual, and whoever is possessed of the true scientific spirit can bring it to bear in the solution of any problems with which he is confronted in the course of his daily work. The observant physician possessed of the critical faculty can do more to advance medicine by his work at the bedside than many who lead a sheltered life in a laboratory. The investigator who aims at extending the boundaries of knowledge must have initiative and courage, and above all must possess vision, for without that uncanny power of seeing into the nature of things and discovering secrets hidden from others the laboratory

worker may obscure the path of progress and become a real danger to the advance of knowledge.

The chief purpose of a laboratory training is not to teach the students how to use elaborate instruments or to perform complicated chemical tests. The incalculable gift of the laboratory is its discipline in scientific method, and its training in the importance of logical reasoning and the use of exact language in speaking and in writing. The scientist is always distinguished from the empiricist by his accuracy in measurement, by his precision in statement, by his honesty in accepting and handling evidence, and by his fairness in presenting it when contesting the opinions of those in opposition to his own views. In that sense every general practitioner should be a research student, and the family doctor ought to train himself to employ scientific method at the bedside in the same masterly manner that it is used by the worker in the laboratory.

Clinical medicine in the past has been so much a matter of personal skill and experience that when the clinician dies his work dies with him, whereas the results of investigations in a laboratory are recorded so carefully that something tangible always remains to enable one worker to take up a subject at the stage where another has finished. There can be no doubt that skill in diagnosis, and more especially skill in prognosis, must always be largely a matter of individual experience; but if such valuable knowledge, gained during a studious life, is not to be lost when he who accumulated it dies, some means must be found to provide a foundation on which future investigators may build. That is one of the chief aims of the Clinical Institute, where accurate observations of the disturbance of the processes regulating the function of the different organs of the body are carefully recorded. The cases are reviewed at regular intervals, when all the symptoms are reconsidered, and an attempt is made to distinguish those due to disturbances of those processes which are essential to the maintenance of life from symptoms due to the interference with processes which are not essential to life. The "follow up" is of the first importance in all records, because without it the case is of no clinical value; what is wanted is the patient's medical life-history, consequently the disease must be under observation from its onset to its termination.

It is generally supposed that the greater the number of patients a doctor sees the greater his experience and his knowledge. That is only a half-truth, because a doctor may see hundreds of patients, and be most meticulous in recording the symptoms during a passing phase of the disease, and yet be none the wiser regarding the prognostic significance of any one of them. Mackenzie always insisted that "prognosis is the motive which inspires note-taking with the breath of life, making the notes a perennial source of knowledge that can be applied in the practice of medicine."

What is needed most of all is that the research student in the laboratory should get into closer touch with the realities of clinical medicine, because any cleavage between the laboratory worker and the general practitioner impoverishes both. There is no life in the ordinary textbook on laboratory methods. The doctor in the country finds little use for tests he cannot readily apply at the bedside of his patient. The clinician can never be replaced by the laboratory worker. Each is complementary to the other; each has much to give and much to gain. I can well believe that the laboratory worker does not realize how much the clinician has lost in recent years by his reliance on the laboratory for help to diagnose disease, when by a careful study of symptoms he might have recognized it for himself. We must look to the living to learn the laws of life, not to the dead. The true clinician never gets into a rut. He at all times feels the sense of adventure and discovery. He must always have an open mind, and when, in the course of research, facts are discovered which are opposed to accepted theories, these hypotheses must be abandoned even although supported by high authority. Work of that kind requires much persevering effort and much patient waiting for proof, but the goal aimed at must always be indisputable accuracy. No evidence can be accepted without the most rigid scrutiny.

The clinician must try more and more to think in terms

of the normal rather than of the abnormal. It cannot be repeated too often that the symptoms of disease are only the premature occurrence of the signs of exhaustion due to over-exertion of the organ when in a state of health. It will be a great gain when the experimental physiologist gets into the habit of leaving his laboratory from time to time in order to visit the wards, the dispensary, and the operating theatre under the guidance of the physician and the surgeon.

A new clinical physiology is much to be desired—a physiology which deals with the symptoms of ill health and tries honestly to estimate the functional activity of every organ of the body. The more those apparently simple matters are investigated the greater will be the regret and astonishment to find so many gaps in our own knowledge. Mackenzie never tired of trying to drive that fact home. He took a delight in astonishing his visitors by such questions as the following: Why does cancer kill a man? What is it that kills him? Why does he die? At those times his conversation was fascinating and stimulating, but sometimes very puzzling and bewildering. It was necessary to admit that usually the questions he asked, although going to the very root of the matter and proving how ignorant we are of some of the most fundamental problems of life, are in the present state of our knowledge unanswerable. Doubtless, by the advance of science and the increase of knowledge, those problems will one day be solved, and I venture to predict that the family doctor will play an important part in their solution.

VILLAGE SETTLEMENTS FOR THE CONSUMPTIVE.

ABSTRACT OF THE MITCHELL LECTURE FOR 1927.*

BY

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PERHAPS in no disease more than in tuberculosis has the outlook changed so much in recent years. With the progress of modern research its horizon has widened, its problems have multiplied, and the work to be done increased. Indeed, the medical profession is marching, on the whole, abreast of the time, for it is now recognized that in that common disease tuberculosis a number of conditions must be studied and provided for—a complex involving medicine, sociology, psychology, and economics.

A diseased organ is now considered in relation to its environment. Formerly it was only the affected organ apart from the rest of the body that attracted attention; but gradually the conception of the interaction of organ and organism and the interplay of forces, "resistance," and immunity were taken into account. It is now essential to go a step further by recognizing that environment plays an important part, not only in the propagation of, but also in the fight against, disease. The recognition of this factor of environment makes it possible to combine the purely medical measures directed towards cure with the medico-social effort designed to prevent disease. As soon as the social aspect of cure and prevention is established educational health work takes its rightful place in the State.

Now it is obvious that if these ideas are to be carried into effect the opportunity must be provided for putting them into practice. An environment must be provided in which the following considerations have due weight: the functional power of the damaged organ within the organism must be protected so as to avoid excessive strain or, indeed, further impairment, and the patient as a whole must be so situated as to avoid opportunities which may impair his power of resistance and recuperation. Those ideas represent a great advance on that of the mere passive or active treatment of disease by ordinary therapeutic measures. Their acceptance presupposes a field of vision extending far beyond hospital or laboratory walls. It postulates a study of social and economic laws too often neglected by

the medical profession. It opens up a new field for research and an ever-widening scope of industrial conditions of employment—and not of the healthy only, but of these who, on account of their disability, cannot keep pace with the able-bodied, and who, even if they could keep pace, are potential "carriers" of disease.

Gradually the State attempted—and not without success—to grapple with the disease, both from the individual and from the community point of view. Sanatoriums were erected all over the country, some managed by private philanthropic agencies, others by local authorities, counties, or county boroughs. It was soon obvious that the poor required further care after the period of early treatment had been completed. Statistics show that from 27 to 64 per cent. of patients die within five years after leaving the sanatorium, a great majority of them dying within the first two years.¹

It is intelligible why patients do not enter a sanatorium until the disease is well established. The early symptoms of pulmonary tuberculosis are so vague that it is quite natural that the patient's attention should not be seriously challenged by them. Thus it is that the consulting physician, and even the family doctor, too often never sees the patient until the disease has done much of its insidious work. The reasons for the failure of early diagnosis, and still more of early treatment, lie in "human nature" and in economics. Is it not because in the case of the well-to-do the human factor, and in the case of the working man the economic factor, has been ignored, that a system for the treatment of patients has been built up at a stage when they do not, and so far as can be seen at present will not, come up for treatment? For such cases our large sanatoriums are waiting; and wait in vain.

It has been said that 25 to 55 per cent. of the cases of pulmonary tuberculosis remain unnoticed to the local authority,² and that the cases that are notified come for the most part from those on the lower rungs of the social ladder. On the higher rungs the notifications gradually become fewer, and finally, near the top, cease altogether. Are we to assume that in the higher social scales tuberculosis is rare or unknown? Observation convinces me that this is not so; the condition is recognized, but it is too vexatious to be faced boldly and promptly. It is therefore not surprising that sanatorium treatment in the majority of cases does little more than patch up the damaged organ; it is far from assuring complete arrest of the disease. One of two courses must eventually be adopted: either sanatoriums must adapt themselves for the treatment of cases without any prospect of complete arrest of the disease, or a new system must be inaugurated which will do so; further, in addition to whichever of these possibilities is adopted, preventive measures must be taken to stop the spread of infection.

It must, however reluctantly, be admitted that in 75 per cent. of the patients now sent for treatment to our sanatoriums complete cure is out of the question. Efforts to obtain the case early will quite rightly continue to be made; but how to deal with those in whom the disease can at best be only arrested is a most difficult problem, for in more than 50 per cent. of the cases now seen in sanatoriums arrest is far from permanent.

The most difficult problem, and the most frequent patient, is the man or woman in whom the disease has had its way for some considerable time and in whom permanent damage has been done. Were the main problem of tuberculosis, as is constantly stated, the treatment of the early case, and this only, why are there all these schemes for after-care, farm colonies, and the like? The sanatorium, with its adjunct the dispensary, should meet all requirements. But this condition is now known to be a figment of the imagination; the reality is much more serious, for it forces itself upon attention and unjustly emphasizes the failure of sanatorium and dispensary. The position must be reconsidered. The popular opinion, built upon certain findings of pathologists in laboratory work, that tuberculosis is a fairly curable disease, does not stand the test of clinical results.

How different is the picture of the treatment of early tuberculosis from that observed day in and day out in a tuberculosis dispensary, where seriously damaged patients

* Delivered before the Royal College of Physicians.