

# THE IMPORTANCE OF SYMPTOMS IN MEDICAL PRACTICE AND RESEARCH.

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## 1. The Science of Medicine.

THERE are many matters in Medicine seemingly so simple that it is taken for granted they are beyond further discussion or investigation. Of these simple matters, the symptoms common to ill-health are the most prominent. Ever since Medicine was seriously studied, symptoms have received attention, and the notion is firmly held by medical men, specialists, physicians, surgeons, and experts of all kinds, that the symptoms revealed by the doctor's unaided senses are so well understood that the information to be gathered from them has been exhausted, and that their further study is not necessary to the progress of Medicine; hence has arisen the belief that for the progress of Clinical Medicine new methods are necessary for further elucidation of symptoms.

This mistaken attitude towards symptoms is not only misleading, but hampers Medicine in practice and research. Indeed, the importance of symptoms is so imperfectly realised that an accurate description of the meaning, mechanism, and significance of symptoms is nowhere to be found, and constitutes a great defect in medical knowledge.

Although this defect in the knowledge of symptoms may be recognised it is not easy to understand how it is to be remedied. This is due to the fact that, notwithstanding the strenuous efforts that have been made to advance medical knowledge, the manner in which medical science should be prosecuted has never been understood. It has been assumed that investigation in Clinical Medicine was a simple matter, and that any one with the usual medical education was fitted to undertake clinical research. It has never been recognised that for its research principles and methods are required which are different from those used in other branches of medical science, while a long training of the investigator is necessary, of a kind rarely undertaken.

# Importance of Symptoms in Medical Practice

## 2. The Importance of Symptoms in Diagnosis.

The urgent need for a better knowledge of symptoms can only be realised if the great defects in medical knowledge are recognised. The general practitioners are the people who are brought into contact with the illnesses which impair the health of the community. An analysis of the complaints which the general practitioner sees, reveals the present state of medical knowledge. If we put aside the trivial ailments, and consider the illnesses which lower the health of the great majority of people, it is found that only a small percentage (5 to 10) are capable of being diagnosed with any degree of accuracy. Most of this small percentage are cases of disease so advanced that the organs are damaged beyond repair, as apoplexy, chronic Bright's disease, gangrene of the feet, advanced heart disease, and these are the end-results of a long period of ill-health, whilst the origin of the ill-health was not detectable. Even such diseases as consumption, and gastric ulcer, are in all probability secondary or superadded diseases—at all events the diagnosis before gross changes take place cannot be made.

The backward state of diagnosis is illustrated in these two latter conditions. They are such common complaints, and have been the subject of long and careful investigation by innumerable doctors, yet to-day we cannot detect consumption until the lungs are damaged, usually beyond repair, while, as regards gastric ulcer, Sir Berkeley Moynihan, out of his great experience, comments on the difficulty in diagnosis, and states that it is disheartening and humiliating to ponder over the mistakes in diagnosis made by careful and experienced medical men, that have been revealed in operation.

To appreciate the significance of this lack of knowledge of diagnosis one has to see it in relation to the health of a community. In a town of 100,000 inhabitants 25,000 will likely consult doctors in one year. 5000 may suffer from trivial complaints and accidents. Of the 20,000, only a small proportion will suffer from diseases that are diagnosable, say 2000. We have then, in a population of 100,000, 18,000 people ailing, of the nature of whose complaints we are still profoundly ignorant.

When the significance of these figures are grasped it will be seen that there is an urgent need for some method in the investigation of disease, different from that which has been pursued in the past.

# Sir James Mackenzie

## 3. The Importance of Symptoms in Prognosis.

Prognosis is the judgment of the significance of symptoms as indicating the future course of the patient's complaint. A knowledge of this branch of Medicine is absolutely essential to the intelligent practice of Medicine, and it concerns every one who has to deal with the sick. Before any course of treatment is taken it is necessary to understand whether the complaint is amenable to treatment. The fitness for the patient to do his work, or to live in a given place, all depends on a knowledge of prognosis. It is scarcely necessary to refer to its importance in regard to life insurance and the examination for military, naval, and Government services.

A knowledge of prognosis can only be acquired by the detection of symptoms and the ability to recognise whether these symptoms are the expression of a diseased state or merely a variation of the normal, indicative neither of disease nor of impairment. When it is recognised that the symptoms are an expression of disease, it is necessary to tell whether they represent a damage to the body which impairs its functions, and whether the damage is stationary or progressive.

The need for this kind of knowledge is readily visualised if some illustration be given by reference to well-established practice. Many eminent and experienced surgeons have seen disastrous results from a delay in operating an appendicitis, so that they strongly recommend that all suspect appendices should be removed. The result of such a procedure is that a great many people are subjected to the operation when there is no disease of the appendix. This is simply due to the fact that medical knowledge has not advanced so far as to interpret correctly the symptoms of appendicitis, nor to understand their significance, so that large numbers are operated upon unnecessarily. Antitoxin is believed to be such a potent remedy in diphtheria that, as a matter of routine, every one who contracts this disease is given it. We know that diphtheria, in the majority of cases, is not a serious disease, yet, because of an absence of knowledge of prognosis, the remedy is given indiscriminately to every one.

It will be said, of course, that in the case of appendicitis and diphtheria, it is impossible to foretell which cases will become dangerous, but that is merely stating in another way the fact that medical knowledge has not yet advanced far

## Importance of Symptoms in Medical Practice

enough to understand the prognostic significance of certain symptoms.

Not only has medical knowledge not advanced so far as to permit a prognosis in such instances, but it has not gone so far as to recognise either the importance of the subject or the manner in which the knowledge can be acquired. A little consideration will reveal that this knowledge can only come from a long experience, yet in matters dealing essentially with prognosis, such as in life insurance examinations, and in recruiting, a medical qualification is deemed to carry with it the ability to give a prognosis, and young doctors with little experience are expected to give one.

When the real significance of a prognosis comes to be understood, the attitude of the profession to-day will seem amazing. There is no branch of Medicine which requires so profound a knowledge of disease and its manifestations, a knowledge that can only come through long experience and painstaking observation of symptoms. But so far the profession has not yet awakened to the great defect in knowledge of this very important subject, and how little progress is being made in its development.

It is now more than forty years since, as a young graduate, I was permitted to examine a lady with a systolic murmur. It had been discovered accidentally by a distinguished Edinburgh physician, and he had ordered the patient to bed and prescribed digitalis, which she was taking in large quantities. She and her husband were warned of the danger of the heart condition, particularly in regard to pregnancy. For a time a careful life was led, but gradually she resumed her old life, and lived for a great many years an energetic life. Although the murmur persisted she is now well over 70 years of age and shows no sign of heart failure. A short time ago I was asked to see a youth, who had been confined to bed for three months because a physician attached to a large teaching hospital had detected a systolic murmur, which I had no difficulty in recognising as being physiological. This inability to recognise the prognostic significance of a murmur is not exceptional by any means, and I place these two instances in juxtaposition to show how little progress has been made in forty years in even such a simple matter as this. But one has evidences of this lack of progress everywhere, and nowhere more strikingly than in the matter of life insurance. The medical forms in regard to the

## Sir James Mackenzie

circulation have scarcely altered, if at all, for over fifty years, as if medical science had not advanced since then.

Nor is there any prospect of advance in this important matter till a better knowledge of symptoms is acquired, and it is recognised that the only person who can advance this kind of knowledge is one who has the opportunity of seeing the progress of disease in individual patients, watching them intelligently through complaints from start to finish.

### 4. The Importance of Symptoms in Treatment.

Treatment which consists of the introduction into the body of an agent—drug, vaccine, serum, electricity, X-rays, radium emanation—produces reactions, often indistinguishable from the symptoms produced by certain diseases, as in patients with vomiting, diarrhoea, drowsiness, headache. Certain of these remedies act by removing a noxious agent, as by vomiting or purging or by killing it, as mercury in syphilis. But the vast majority of remedies, when they have any effect, act by modifying the symptoms of disease. This is the justification for treatment, particularly in the case of suffering—to relieve the distressful symptoms. It will thus be seen how important is a knowledge of symptoms for the intelligent investigation of drugs or other remedy. The drugs which find a place in the pharmacopœia have never been studied from this point of view, with the result that a great number of utterly useless drugs are included, while those which are of use have never been studied with that care and accuracy necessary to recognise the real effect of the drug on the diseased human being. Experimental investigation shows how a drug may act on healthy tissues, but drugs are not given to the healthy but to the sick who show symptoms of disease, and it is for the removal of the causes of the symptoms or for their modification the remedy is given. This is well illustrated by the use of digitalis. For 150 years the drug was known to have a beneficent effect in heart disease, but no clear conception of the kind of case existed, so that it was given indiscriminately to all patients who had or were supposed to have a cardiac affection. Many attempts had been made to find out its effect in the human heart, including experiments on animals, but it was not until the symptoms, particularly the abnormal rhythms, were understood that its effect on the human heart was discovered, and the kind of case in which it acted beneficially was recognised.

# Importance of Symptoms in Medical Practice

The principle which guided to this discovery was the intelligent perception of the symptoms with a knowledge of their mechanism, and then the careful observation of the effect of the drug in producing or modifying these symptoms. Before an intelligent investigation into the action of remedies in the sick human body is undertaken, a knowledge of symptoms is necessary.

## 5. The Importance of Symptoms in Research.

There is to-day a recognition that medical knowledge is greatly lacking in many essentials, and strenuous endeavours are made for the encouragement and prosecution of research. Where a clear conception of the problem is attainable, an orderly and well-planned investigation may result in a successful issue, as in the investigation of malaria and allied diseases and syphilis. An absence of a clear conception of how research should be pursued leads to a disorderly attack and a great waste of time and energy is bound to result. The vast majority of diseases which afflict a community in this country have not been clearly defined, so that any attempt to prevent or cure such disease is sure to lead to failure. It is therefore manifest, before we can attempt to deal effectively with the more common diseases, a knowledge is first required of the manner in which these diseases affect the human body. While the study of how a noxious agent which produces disease, such as a microbe, may behave in culture media or in animals may be necessary to the inquiry, yet a knowledge of how the noxious agent acts upon the human body is also necessary. As this knowledge can only be acquired by the study of the reactions produced in the body, the importance of symptoms is apparent.

A wider view of research must also be taken. As already indicated, diagnosis, prognosis, and treatment are essential to the practice of Medicine. Research in these subjects is urgently called for. Such research can only be undertaken by those who have the opportunity of seeing individuals in ill-health, so that an investigation of the symptoms of disease, carried out systematically and with a precision hitherto unattained, is urgently called for.

Investigators are recognising that they have only an experience limited to certain aspects of disease, and they find it necessary to associate themselves in bands or teams for the prosecution of research. Many of these teams include men

## Sir James Mackenzie

profoundly informed in their particular branch, but there is one member essential to this work who is invariably absent—one with a knowledge of the symptoms of disease. The need of this type of investigator is recognised, and one with clinical experience is sometimes included in such a team, but medical knowledge has not yet advanced so far as to enable such an investigator to recognise that his knowledge of symptoms is so imperfect that he is unfitted for such work.

In the intelligent prosecution of medical research, therefore, a knowledge of symptoms is essential.

### 6. The Mechanism of a Disease Process.

It is necessary to hold clearly in mind what disease is, although it may not be possible to give a logical definition.

The term disease as commonly applied refers to a distinct condition or entity. When, for instance, a patient suffers from pain in the eyeball and lachrymation, and the conjunctiva is seen to be red and injected, we recognise that he suffers from a disease, or a diseased state. An examination by one doctor may fail to reveal any further facts, and he would call the disease conjunctivitis. Another doctor may recognise that the symptoms of photophobia, lachrymation, and injection of the capillaries are phenomena produced by a foreign body acting on certain tissues of the eye and may detect a speck of coal implanted on the cornea. This removal of the foreign body is followed by a disappearance of the phenomenon.

### 7. The Definition of Disease.

Here we have a clear example of what constitutes disease, and from such an instance disease can be defined, for practical purposes, as *a state induced by an agent acting injuriously on the tissues*. The speck of coal by itself is not a disease, nor is the lachrymation and other signs. When, however, the speck of coal produces these signs, the whole syndrome (agent and attendant phenomena) can be conveniently grouped under a definite term—disease.

When the ailments that affect the human body are carefully analysed it will be found that the vast majority conform to this definition of disease. The noxious agent may be a foreign body, a microbic infection, or a chemical agent, all of them innocuous whilst outside the body, but on their entrance into

# Importance of Symptoms in Medical Practice

the body, as soon as they cause a reaction, a state of disease may be said to be produced.

In many people who suffer from ill-health the matter is much more complicated, but this is simply due to the fact that with the persistence and progress of the diseased state new reactions are set up until the number is so great that the original disturbance is lost sight of. Nevertheless, fundamentally the onset of ill-health was provoked in the manner described in the definition.

## 8. The Detection of Disease.

In the simple illustration of the foreign body in the eye, the noxious agent and its effect upon the tissues are readily seen and recognised, but the cause of ill-health in the vast majority of cases cannot be so readily found. The noxious agent is more subtle; its mode of entrance into the body is undetected and the original seat of disturbance obscure. As a rule there is no direct evidence of its nature, and seldom can a diagnosis be made, based on its detection.

While the agent which provokes the ill-health is therefore not recognisable, the phenomena or the symptoms it produces afford the clue by which it may be detected. These phenomena vary widely, but they depend in the main upon two factors:—

- (1) The nature of the noxious agent.
- (2) The tissue acted on.

It is scarcely necessary to elaborate this point. The agent may be, as already stated, a foreign body, a microbe, or a chemical agent, and it can be understood that the action of these different agents on the tissues would vary; while the tissues acted upon, as fibrous tissue, muscular tissue, nervous tissue, or secretory cells, would give reactions peculiar to their functions.

Direct detection of the noxious agent being often impossible, we are driven to seek for it by following up the clues afforded by the reaction of the different tissues, which in the human body we recognise as the signs and symptoms of disease.

## 9. The Definition of Symptoms.

Much consideration has been given to the definition of symptoms and signs of disease. In this article no distinction is made between them. The terms symptoms, signs, manifesta-

## Sir James Mackenzie

tion, phenomena, are used interchangeably, and mean a *reaction of the tissues of the body to a noxious agent*.

### 10. Methods for Investigating Symptoms.

Recognising that symptoms are the reaction of the tissues of the body to a stimulus by an agent, for a due appreciation of their meaning certain of their features have to be clearly understood. A person in ill-health may present some readily detected sign, as pallor, or suffer from some sensation, as pain, and the custom has been, when the doctor has failed to find the causes of these symptoms, to diagnose the cases as anæmia and neuralgia. So long as such diagnoses satisfy, it is manifest no progress can be made. No doubt there is a difficulty in getting beyond this step, and medical science has not yet advanced so far as to recognise the method by which further knowledge can be acquired.

The first step to be taken is to find the mechanism by which symptoms are produced. No doubt many observers have attempted this study and a limited advance has been made. The state of the blood has been the subject of much inquiry, and a great many facts have been accumulated. Likewise, pain has been the subject of much study and again many facts have been accumulated, yet the results have led us on but a little way, and are scarcely commensurate with the time and energy spent on them. The reason for this comparative failure is that we do not yet understand the principles which should guide research in Medicine. If we take one of the commonest of symptoms, that of pain in disease of the viscera, and consider what information it is capable of yielding were it thoroughly investigated, we will understand some of the steps necessary to be taken for advancing our knowledge of disease.

Investigations have shown that the pain in disease of the viscera is referred to some portion of the external body-wall, frequently remote from the seat of disturbance. The mechanism by which this is brought about seems to be as follows. A stimulus of a particular kind arises in an organ produced by some noxious agent. This stimulus passes by a sympathetic nerve to its cell in the central nervous system. There the stimulus passes from the cell to other cells in its immediate neighbourhood, and these cells, when stimulated, react according to their function, a secretory cell modifying the secretion; a muscular cell giving rise to contraction in its muscle; a pain

# Importance of Symptoms in Medical Practice

cell producing pain referred to the peripheral distribution of definite nerves in the external body-wall.

There is thus good reason for assuming that there is a relation, precise and definite, between the viscera and areas of the external body-wall, through the nervous system. When this relationship is better understood, it will then be possible to say, when a patient complains of a pain in a definite region, in which organ the disturbance is which produces the pain.

The next step will be to recognise what tissues of the organ are capable of giving rise to pain when stimulated. We do know that certain tissues may be subjected to much injury and destruction without pain, while other tissues readily cause pain when stimulated in a particular manner.

The last and most important step is to recognise the nature of the stimulus—it may be the noxious agent which is the cause of ill-health. We know that not all stimuli applied to an organ will give rise to pain. For instance, the cutting or tearing or burning of organs may occur and no sensation be elicited. Yet we do know that visceral disease is capable of giving rise to pain of all degrees of severity. Manifestly, then, it is only stimuli of a peculiar kind that are capable of producing pain.

Inquiry so far has revealed that there are probably but a few kinds of stimuli capable of producing pain, and that these can be differentiated in several ways—by the character and duration of the pain, by the conditions that tend to provoke it, and by the presence of other phenomena which have been provoked at the same time and by the same stimulus. It will be seen that this line of investigation holds out the expectation that pain and its associated phenomena may not only indicate (1) the site of the organ, but (2) the tissues disturbed, and (3) the nature of the agent producing it.

There is now sufficient evidence to show that specific agents on entrance into the body produce specific reactions. This is recognised in the case of the exanthemata, even though the agent has not been actually recognised in all cases. With a better understanding of the mechanism by which symptoms are produced, and by the detection and correlation of associated symptoms, and the careful study of the conditions found post mortem, or on the exposure of the viscera by operation, combined with bacteriological and other laboratory inquiry, the morbid state—provoking agent, and reactions—will be elucidated.