

# The Value of Laboratory Training to The General Practitioner

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THE greater number of those entering on the study of medicine have in mind the primary aim of acquiring a medical degree with a view to practicing their profession. A small minority study medicine because it is their intention to engage in research. Needless to say most of the latter after graduation, in addition to their laboratory duties, also engage in a certain amount of teaching. Many eventually develop into teachers, with research playing a subsidiary part. The gap between these and the actual practitioner is a wide one because of the divergence of interests. The practitioner is largely an empiricist, taking for granted a good many assumptions whether proved or not. The researcher and teacher on the other hand casts a critical eye over everything that comes to his notice—at least he ought to. If the facts given in support of any theory have been substantiated by different groups working independently, he is willing to accept the hypothesis. The practising clinician, however, is not in such a favourable position because his critical faculty is not exercised to the same extent. This accounts in large part for the enthusiastic support given by some clinicians to scientific and very often to very unscientific procedures. Further, the laboratory worker is always a sceptic—or, if one may use the phrase, a doubting Thomas,—whereas the practitioner lives largely by faith. This very implicit faith of the practitioner forms the corner stone of the pharmaceutical manufacturer and instrument maker in pushing their wares. The physician, too, busy with his practice, with little time to sift the claims of the advertising “literature” and of the high pressure salesman, soon falls a victim to the path of least resistance, and his value to the profession, as a critical unit, is lost. Actually he becomes a drag on progress because he will support unsound hypotheses. To give an example: the new fad, backed by medical men, of a certain health society which advocates a session in the lavatory after every meal. Of all the preposterous ideas, this must take high rank. Apart from the silliness of it all, imagine what would happen at a dinner party. Moreover, mild constipation never killed anyone. Of course one can excuse the fad on the basis of constipation being a thief of time.

Let the value of a laboratory training be pointed out, not only for students but for practitioners. To students it offers a training ground for learning the technique of manipulating instruments, and the use and value of chemical reagents. In anatomy and experiments on animals it affords ample scope in the handling of scalpels and forceps, as well as exercise for the fingers to make them more nimble in manipulating organs and instruments. Animal experimentation, too, affords a good opportunity for the student to test the action of drugs or physiological procedures for himself. He thereby consolidates his knowledge in a practical way. To give an instance, a student who can inject a drug into a leg vein

of a dog need never worry about succeeding on a human vein. Further, by carrying out a course in practical work the student becomes familiar with procedures, all of which are applicable to the practice of medicine. For the person who intends to engage in research, a wide training in laboratory methods is of infinite importance, for then he will be enabled to test his ideas in more ways than one. The practitioner who wishes to undertake research is of necessity handicapped in having no such training. It is because of such circumstances that strychnine was labelled a cardiac tonic by a physician who occasionally indulged in laboratory experimentation.

The attitude of the scientific worker toward research is not to establish what looks plausible, but to investigate critically. Whether his results are positive or negative matters little to him, provided they are true. Very often laboratory results have no immediate application to medicine, but they aid in understanding biological processes. Until the normal is fully elucidated and understood, there is little hope of grasping the mechanism of the abnormal, as occurs in disease. Take some instances of laboratory results influencing treatment. First and foremost in the field of chemotherapy come Ehrlich and his associates. His work on dyes and organic arsenical compounds are a monument to his painstaking energy, patience and critical faculty. The off-shoots of his laboratory methods have been far-reaching and they have enabled progress to be made in many other fields. Secondly one may mention the enormous strides that have been made in the field of endocrinology and the resultant benefit to multitudes of patients. In no section of medicine was quackery more widespread than in this. Empiricism of the worst kind held sway. Yet today, thanks to laboratory workers, treatment of endocrine disorders is most scientific, and it is reasonable to assume that the physical improvement of the human race will be evident in a generation or two, thus providing better cannon fodder than before. In the field of nutrition advances have been equally dramatic. One may mention only the advances made in the study of vitamins. These should strictly be classed as drugs. The study of their actions and chemical constitution has in the main been carried out by laboratory workers. The results obtained on animals have been applied to the clinic, on the whole, with satisfactory results. As a result of this the diets prescribed for children and adults now rest on a scientific basis. Knowledge of the physiological mechanism of digestion has been of great benefit in treating digestive disorders. Practising gastro-enterologists have added their share to progress in this sphere not only because of their contributions but because they were able to confirm or disprove physiological theories. It is justifiable to ask, however, whether such progress would have been possible without the work of Pavlov and his school.

The standardization of drugs such as digitalis, squills, ergot, pituitary extract, insulin, antitoxins and numerous other substances are other instances of progress in therapeutics. Investigations into the constitution and action of these have led to important advances in their use. One may add that clinicians have often been able to add to the laboratory findings valuable data from their observations. As an instance take the isolation

of ergometrine by Dudley and Moir. In neurology, too, laboratory workers have made tremendous advances.

Excessive claims made for anything can soon be proved by subjecting it to rigorous, controlled tests. In the field of cancer research, no one who arms himself with a hypodermic syringe and a few mice or rats, or merely with a few pathological specimens and microscope slides can claim to be an expert in that department, nor can a general practitioner who takes a three months' course make a similar claim. Before anyone ventures into cancer problems he should be well versed in the function of normal cells and be fully acquainted with the technique of tissue culture. This involves laboratory work of an arduous nature. It is obvious that the study of such fundamental subjects as physiology, biochemistry, pathology, pharmacology and biology, which are of vital interest to the progress of medicine, is largely a laboratory one; while the study of disease is carried on largely in the hospitals. The aim of laboratory training is to bring about a better understanding of normal and pathological processes and a closer association between clinicians and laboratory workers.

#### LAENNEC'S DISCOVERY OF THE STETHOSCOPE

"In 1816, I was consulted by a young person who was laboring under the general symptoms of a diseased heart. In her case percussion and the application of the hand were of little service because of a considerable degree of stoutness. The other method, that namely of listening to the sounds within the chest by the direct application of the ear to the chest wall being rendered inadmissible by the age and sex of the patient, I happened to recollect a simple and well-known fact in acoustics and fancied it might be turned to some use on the present occasion. The fact I allude to is the great distinctness with which we hear the scratch of a pin at one end of a piece of wood on applying our ear to the other.

Immediately on the occurrence of this idea I rolled a quire of paper into a kind of cylinder and applied one end of it to the region of the heart and the other to my ear. I was not a little surprised and pleased to find that I could hereby perceive the action of the heart in a manner much more clear and distinct than I had ever been able to do by the immediate application of the ear.

From this moment I imagined that the circumstance might furnish means for enabling us to ascertain the character not only of the action of the heart, but of every species of sound produced by the motion of all the thoracic viscera and consequently for the exploration of the respiration, the voice, the rales and perhaps even the fluctuation of fluid effused in the pleura or pericardium. With this conviction I forthwith commenced at the Necker Hospital a series of observations from which I have been able to deduce a set of new signs of the diseases of the chest. These are for the most part certain, simple, and prominent, and calculated, perhaps, to render the diagnosis of the diseases of the lungs, heart, and pleura as decided and circumstantial as the indications furnished to these surgeons by the finger or sound in the complaints wherein these are of use."—From "Fighters of Fate" *J. Arthur Myers*.