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THE BIOLOGICALLY MINDED PHYSICIAN[1]

By Dr. Wm. deB. MacNIDER

KENAN RESEARCH PROFESSOR OF PHARMACOLOGY, THE UNIVERSITY OF NORTH CAROLINA

I HAVE often wondered why there were commencement addresses and why an individual should even for the moment assume such a degree of egotism as to gain the belief that he had something worth while to say on such an occasion. The only possible excuse on the part of presidents and deans in commanding such addresses is that it is of their nature to command and in addition such statements which are supposed to be buoyant with thought, tinged with advice, have become a custom, and customs are not bad things; they are at least of some value, in terms of historical continuity. More than likely on some rare and ancient occasion some individual happened to say something worth while to a group of people who were graduating, and then it was that certain high officials in academic life said this must be done each year for ever and ever, and it is done. We have found, I feel, a part of the answer to the question which I have raised, but the important part of this question for you and for me is not answered. Why do I assume for the space of half an hour, when you have been talked at and talked to for four years, that I should catch you and detain you for another period for the same purpose? I can not answer this question except that as a teacher for thirty-seven years I like to be with young people when they commence a great adventure, set their sail and make a start, and because I wanted to be here and feel the great honesty and truthfulness of Dean Hyman and to gather a certain inspiration by subjecting myself to the stimulating intellects of Professors Nash and Gibbs and to find other minds of a like order in your faculty. With such an explanation for my presence here to-night I want to detain you for a bit, not with advice which is ever so free and repugnant, but

[1] An address to the graduating class of the Medical School of the University of Tennessee, Memphis, March 22, 1937.

to talk about a fine type of physician—the biologically minded physician.

Normal, physiological life is a balanced, related existence of an organism, regardless of the type or lowliness of the organism to its ever-changing environment both within and without whatever this environment may be. The function of the adequately trained and, of more importance, thoughtful physician is to keep this ever-changing life in a balanced and related state, so that the manifestations of its life, its symptoms, may fall in that category of reactions which are called normal. It must be prevented from developing those signs of life which are abnormal and which are dependent upon maladjustments which may or may not have a structural basis for their existence. The physician is therefore concerned not with death but with life, life related as beauty and if he has wisdom and understanding his main consideration will be to recognize very early maladjusted life, attempt to furnish an explanation for it, and institute measures of a natural order to readjust it. Such measures are of a biological nature; artificial, unnatural agencies may be necessary as adjuncts. The physician must be biologically minded and through this mind attempt to see the organism as a whole in all its somatic and psychical departures from the normal. The organism furthermore must be seen as individual and related as individual in a happy, useful and effective fashion to that environment which circumstances have determined to be its environment. "Here is a task for all that a man has of fortitude and delicacy," and may I add, of science, of economics, of religion and a sympathy which relates skill pleasantly. How thrilled you should be to have selected a domain of understanding into which you can pour freely trained minds in such a biological adventure.

Operating in the order and at the level which has been indicated, a physician's life expresses itself as a field biologist and more, for he must consider social relationships, economic demands and emotional reactions in his group of diverse individuals whom he is attempting to adjust. His life is an experimental one with all the joys of investigation until years of experience have given him an understanding which enables him through accumulated reason to say you should do this or you should not do that if you care to maintain a normal balance and adjustment. He has developed medical sense of a biological order. The experimental method, insisted on by Claude Bernard and now used in the teaching of science and which should be used to understand all relationships in which life is concerned, only commences in the laboratory. Its medical use reaches its height when employed by physicians not only in hospitals but also in homes of such wealth that they have become pathological and in the quiet, kindly cottages and huts which need light from an experimentally minded and inquisitive physician. May I recall to you in this connection that the greatest of medical biologists was a tanner's son with a something within him which persisted in asking the why and the wherefore of things and who through toil guided by reason succeeded in answering some of these questions for himself and for the mind of man through experiments, many of which were essentially simple. Truth has the tendency to emerge in simple individuals and to show itself through simple experiments. And again in this same connection you will recall that the great advance made in the understanding of heart disease did not come from an elaborately mechanized laboratory but from and through the mind of a country doctor in Scotland carrying on his inquisitiveness on human beings living under thatched roofs in districts remote from medical centers. A country physician in Germany wondered (what a blessed power of the human mind to wonder) why cattle in one pasture became ill, and died, while others in an adjoining pasture remained in health. His wonderment forced him to look at the blood of sick and dead cattle, and the cause of anthrax was discovered. Pasteur, Sir James McKenzie and Robert Koch observed and wondered, their wonderment both blessed and burnt to the point of trying, through reason operating experimentally, to find out the cause for departures from the normal, and discoveries were made which advanced biology and medicine and pointed the way in certain particulars as to how mankind could be related and adjusted. May I call your attention to the fact that I have not been talking about earning a livelihood, about money or the things money can acquire. Money is refuse which comes as a by-product of thoughtful living in which happiness develops through a loss of the individual in thought and reason.

The advances accomplished by simple and great men do not come about in an incidental manner or in a hit-or-miss fashion. They are made possible through a training that may not be highly specialized in technique but one which induces thoughtfulness and breeds judgment so that measures of investigation may be applied to a variety of problems. The tasks which have to be undertaken by physicians at the present time not only require information of a specific and technical nature but also a breadth of understanding into subjects remotely related to medicine which is necessary if we recognize in an individual categories other than the physical. How comparatively easy it would be to serve in the capacity of physician to a colony of crabs or earthworms. Their necessary adaptations are in large measure essentially physical, their emotional life other than certain urges of a sexual nature must be negligible and their economic demands

are fairly simple and usually assured. How different in its physical and psychical complexity is the human life which the physician must attempt to relate in a balanced fashion and how broadly learned he must be in order to appreciate the various niches into which this life must fit and function with a smoothness which partakes of beauty. The accomplishment of this difficult task depends first upon the personality of the individual who desires to become a physician, second upon the type of academic and medical training to which he has been subjected and, finally, upon whether or not he has the understanding to see his maladjusted medical problems, but far more, his individuals, broadly, and has the urge to relate them to life and for life both physically and psychically, first by the use of natural measures and later, as adjuncts, by certain artificial measures such as surgical procedures and the employment of chemical agencies in the form of drugs.

It would be most helpful to officers of administration in medical schools to have a given series of tests which could be applied to prospective medical students with the object in view of determining whether or not they have within them those qualities which after having been allowed to operate through a medical curriculum will result in the development of the type of understanding physician which we desire and which the public should want. So far as I am aware there are no such series of tests and there can not be, for individuals have the quality of growth and change within them, and the main function of the medical school is to permit growth and change in the direction of an ideal. It is impossible to look into the face of an individual or to note certain reactions in terms of percentages and determine the potentialities of his brain cells. Their power and biological effectiveness depend so much upon stimuli to which they will be subjected; teachers, for instance, who may drone through intellectual possibilities, or sparks of fire, torch bearers who are also teachers who may consciously or unconsciously transmute the laggard, a dead leaf, who under their influence becomes a living butterfly. The student without promise finds himself. There was something in him which needed a spark, a guide and a subject to release him and permit him to express and relate himself in reason through thought. Attempts have been and are now being made to find out the mental powers of students by employing mechanistic devices which find their end reaction in a card index system. Aptitude tests consisting in rather detached questions in a variety of subjects are supposed in their foolishness to stimulate such answers that an individual may be considered intellectually fit as a medical student and accepted or rejected on this basis. A knowledge of the population of Calcutta would indicate whether or not a student is capable of handling a microscope. With an appreciation of certain biological principles, I would rather have talk with the prospective student and learn of the kind of stock from which he came. What did his forebears do and how did they do it? Did they live dependable lives? Were they psychically adjusted? Such considerations, which may be extended generally, give an admitting officer an idea of the type of stuff he is dealing with and generally the order of reaction he may expect to obtain from it. Furthermore, students going into medicine must have at least two and preferably four years of premedical training. During these years the numerical evaluation of students becomes available in the form of grades. Such records certainly have significance as such and also usually indicate the likes of students. Was he fond of biology, chemistry and physics? Were they delights which impelled him to work overtime? Regardless of grades this happy worker in subjects definitely related to medicine would attract my attention rather than the indiscriminate gatherer-in of grades. The evaluation of the spirit of an individual is most difficult and a card indexing system is not infrequently inadequate for such an evaluation. This may be the thought behind the custom in many medical schools of having students who desire to enter medicine consult regional representatives of the school under consideration. Such a method of evaluation is natural. It is far removed from an aptitude test but furnishes information of an intimate nature. An individual with a collection of A's and B's and with an accurate knowledge of the population of Calcutta might be eliminated if he appeared for such a conversation collarless, with his shirt front ajar and with gaudy socks gracefully draping his shoe tops.

In certain academic communities there are individuals who are designated premedical deans. Such people of the right sort may be most valuable to the premedical student and to the dean-to-be of such students. Such a person may be the guide, the contact to touch off the spark in students for medicine. This can not be done by a statement that our requirements are this and that, you must get them at this numerical order of excellence or you can not go into medicine; but he can veil these ugly truths with the fineness and greatness of scientific thought as shown by the lives of great biologists and chemists and biologically minded physicians. Through biography the student is given an ideal, and this gives him an urge to so accomplish his tasks that he may live his life as a Marion Sims, a Theobald Smith, an Osler or a Thayer or at least yearn for those things which they accomplished by living thoughtfully in simple honesty. The premedical dean I have in mind will not forget that these physicians to be under his guidance "can not live by bread alone,"

that they must have life and, furthermore, aid life pleasantly in others. With all the dean's appreciation of and insistence on the premedical sciences, he will see to it that these students at least have an introduction to other values which may be found in prose and in poetry, in history and in economics. It is through such appreciation that the scientist and physician gain a poise and a peace. They have comforters to turn to during periods of stress and misunderstanding, which will enable them to permit time to untangle the skein, for natural forces to assert themselves and lead to workable adjustments. The student who has this type of training over and above his scientific training can generally keep his feet on the ground and his head in the air. He is well balanced. He uses Wordsworth rather than a caffein beverage and prefers the New Testament to a highball. He is able to withstand adversity and, of more importance, indulge in success without glory and with humility.

Within the medical school students selected and prepared for it enter a specialized division of biology to gain an understanding of the human organism. For what purpose and in what form are they going to use this information and training? The form in which information and training is used is of importance, for through form in the practice of medicine there is given an opportunity for the personality, training, understanding and ideals of the individual to express themselves. Formalities may be superficialities or idiosyncrasies and are usually unnecessary, but the form of life, the form of practicing a profession, is very different from a formality. Good form is the basis of the good life, of the fineness of the good physician, of the good anything which is related to life at a high level of excellence. The biologically minded physician relates himself through good form to his varied problems in many types of individuals.

A premedical student, a student of medicine, a physician, should ask himself for what purpose he has entered this profession. Does he desire first and foremost to make money? Such a thought is so far removed from the biologically minded physician that it would appear crude to raise it and yet there is an ever-increasing number of students who are going into medicine not to become lost in its scientific and applied beauty, not to give and to continue to give in order to be found, but for the purpose of financial and social gain. Such individuals are more dangerous to the profession than are the honest, duly and truly labeled quacks and charlatans, for the first group, cloaked in academic garb and wearing the insignia of doctors of medicine, are not in the open. They are difficult to handle through medical organizations or through legal procedure. Success for them is money, and sooner or later, usually the former, they resort to practices which will enable them to secure money. The dapper surgeon with an ever ready operation, the blundering internist with a composite prescription combining all the glands of internal secretion or the six-week, not six-year, specialist with bluff and self-assurance intrigues the sick and sore at heart into their mercenary care without a thought of a biological nature. One can hardly believe that such prostitutes exist. They do. No vice was the cause of their medical degradation. The cause was the desire for money and for those ephemeral pleasures which money secures. Such individuals know nothing of the durably satisfying things in life. A restoration to health means more patients in terms of more money. A sunset to them is only red. The cry of a child is the call for paregoric and the transfer of coin.

There are students who desire medical training in order that they may do what is known as minister to suffering humanity, to ease pain, to bring happiness to a home which was in sorrow. A medical student, a physician, who does not want to do this should abandon medicine. Rather frequently, however, this type of medical student wants to acquire his medical training with ease. He is sentimentally minded rather than biologically minded. He is superficially helpful, his major objective is to obliterate distressing though useful symptoms rather than to participate in the usefulness to the patient and the satisfaction to himself of having ferreted out the cause of the symptoms and, if possible, removing the cause. Not infrequently this type of physician speaks of indigestion as though it were an entity and prescribes an inert preparation of pepsin for its correction or he narcotizes his own appreciation and judgment and the sensitiveness of his patient with morphine; he uses purgatives in place of an enema, digitalis instead of a bed. This type of medically inclined person is dangerous not because he is a knave but because he is superficially kindly and wants very earnestly to be helpful without being thorough. He is not biologically minded. Not infrequently individuals with this fine sentimental urge long for the medical foreign mission field or for remote country districts where they can put into practice their superficial understanding of an intricate and applied science. The human organism as such and as an individual is just as complex and requires just as much understanding care in the Yangtze Valley and in a mountain cove in North Carolina as it does at Memphis or in Chapel Hill. There can be only one type of physician and there can be only one order of medical school; both, however, with an elasticity which will enable them to acquire and impart medical information which is ever increasing in its complexity and applied usefulness. I am well aware there are thoughtful people who fear that medical men and women of this type of

training will not locate in remote districts and fear that even if they should they will fail to adjust themselves to individuals and situations found in such localities. In a measure they do not have to. Good roads, the automobile and the telephone are agencies which have changed or are in the process of changing, for all time, a type of isolated medical practice which was once known as country practice. This change has been greatly facilitated and perfected by the development of small, privately owned or community owned hospitals. The Mayo Foundation had its origin in a small village serving at first a rather isolated rural community. From such small centers of medical excellence a country district can be served expeditiously and also with fine medical understanding.

There is an ever-increasing number of medically minded people who enter medical schools to obtain scientific information concerning the normal and abnormal human being as organism, and if they be wise, certainly if they intend to apply this information, they will acquire an understanding of this organism as an individual and as a related individual, both biologically and socially. The type of medical instruction required for such a purpose has become more and more elaborate as the science of medicine has advanced through the acquisition of new truth, on the one hand, and both the necessity and the ability of this information to be applied in an illness in an attempt to relate and adjust abnormal individuals. As a result, the curriculum in most medical schools has become, to an extent, standardized through an attempt to impart to its students an adequate amount of such accumulated information so that, with both science and sympathy, they may be safe guides through an illness. It has become impossible for the information in any one of the subjects to be given in detail. This is fortunate for both the instructor and the student. For the instructor it should allow leisure for study and research in the high hope that he may, through creative work, make some slight contribution to his division of understanding. For the student it should permit time for him to express his purpose in the extent and detail to which he can inform himself, with some guidance, in the various subjects of the curriculum. He becomes an investigator and carries this point of view into his practice. He may be permitted to aid in experimental work not only for his edification but also in the hope that such work will stimulate him to go further in learning before he has to so largely concern himself with applying.

As a result of medical research of a biological order, the character of the departments in the medical curriculum has changed amazingly, and this change, which has been for the better, has reflected itself in physicians. The dissecting room, which at one time dominated the entire curriculum, is now, and should be, a useful adjunct to the anatomical laboratories in which it becomes difficult to know whether physiology or experimental morphology is the subject under consideration. The department of biological chemistry has evolved from a laboratory mainly concerned with urinalyses to one in which the higher realms of organic synthesis are considered worth while and which is now in the process of finding itself in chemical problems of a medical character essential to the understanding of the biology of the sick individual. Medicine can not be practiced without this information and the ability to apply it. Physiology, once fairly content to use hours upon hours of a student's time for the understanding of nerve-muscle preparations, goes to the wards to lose itself in unraveling the intricacies of pathological physiology, both for the delight of the student and the welfare of the sick individual. Pathology appears to be participating in an intellectual resurrection. Death is no longer its goal and the dead house its delight. The experimental pathologist who is interested in tissue changes prior to their dissolution, in the ability of tissues to react to injury and to participate in repair, to shift and adapt themselves and yet to function, has given this subject a new light and life upon which clinical judgment must rest in its attempt to modify states of disease by the use of mechanical agencies and chemical measures. There has emerged from a something once known as materia medica a highly specialized pure science, which may be knowingly applied to both normal and pathological tissues, which is now designated pharmacology. This science no longer introduces chemicals into tissues in the darkness of ignorance, without reason and on an empirical basis, but does this in the light of scientific understanding of how a given chemical body may influence normal tissue response and, furthermore, how this response may be modified by states of disease within tissues. Its reach as a pure science and applied as therapeutics is difficult to estimate, for it is in its period of development which in turn very largely depends upon information which the chemist and physiologist will give to it. The name drug is distasteful. It recalls a period when a combination of substances in the form of a prescription was unknowingly introduced into an organism of unknown physicochemical constitution in the hope that something for the betterment of the individual might happen. Such ignorance is in the process of vanishing through the combined research of the pharmacologist and biological chemist. More and more we are being placed in the position of being able to say that a part of the maladjustment of this individual is due to the fact that there is a deficit or an excess in terms of milligrams of a given substance in this organism; therefore, we will balance it in this particular and see what adjust-

ment it can make. Or, the reaction of this tissue is in excess of what it should be or is below what it should be; we will, therefore, introduce this chemical agent in an attempt to modify the reaction to a point where it will at least not be harmful and may be of definite value in the process of biological adjustment. Pharmacology is of particular importance in the medical curriculum and assumes a most significant place in it since it takes for its advancement biochemical, physiological and pathological understanding and carries them through its applied outlet to the bedside in an attempt, by the use of certain chemicals, to modify the untoward symptoms of disease, to facilitate recovery from disease and, with increasing certainty, to eliminate the cause for the departure of the individual from a balanced state of life.

There was a time when the medically minded biologist had, in a measure, to forsake reason and act with what was called common sense, and it was. This occurred when he entered the hospital or found himself at the bedside of a patient other than in a hospital. This is no longer the case. The training of the premedical years and in the medical curriculum permits the one type of reasoning with the same limitations, which become less with each year, to be used now, whereas it at one time could only be used in the laboratory, at the bedside, whether that bedside happens to be in the elaborately appointed private pavilion of a hospital or in the humblest home. Scientific understanding as truth undergoes no modification as a result of situations and circumstances. The modern medical man and woman are therefore no longer healers by chance in a haphazard fashion. As individuals with personality, through training of a general and broadly biological character they have become biologically minded physicians who see it as their function to ascertain the cause for physical and psychical maladjustments and to institute such measures, if possible of a natural order, to readjust to their environment, whatever that environment has to be, individuals who have been forced to depart from it. Such a life is a sound life, for it deals with and lives in nature through reason. It is a happy and useful life, for it gives itself that others may find themselves in a related, balanced fashion which slowly but certainly leads to perfection of the body and through mind to the understanding on the part of such a body of values which are real, durably satisfying and which, in the end, become both lost and found in beauty.

> . . . There's magic all around us
> In rocks and trees, and in the minds of men,
> Deep hidden springs of magic.
> He that strikes
> The rock aright, may find them where he will.

OBITUARY

ARTHUR BROOKS CLAWSON

ARTHUR BROOKS CLAWSON, widely known for his work on plant poisoning of live stock, died at his home in Washington, D. C., on June 30, of cerebral thrombosis. He was born in Green Lake, Wis., on June 18, 1878, and was educated at Ripon College, the University of Michigan and the University of Wisconsin. He taught biology at Lake Forest College, Illinois, for two years and joined the staff of the Bureau of Plant Industry in 1909. He became associated with the group investigating stock poisoning by plants, then an activity of that bureau and spent the remainder of his life in that field, finally taking charge as physiologist, Bureau of Animal Industry, in 1930. He was in charge of the Experiment Station at Salina, Utah, maintained by the latter bureau for the study of stock-poisoning plants, and at the time he was taken sick was on the Utah deserts studying the disease known as bighead. He published a number of papers on the subject of plant poisoning, including papers on larkspurs, loco weeds, lupines, cyanogenetic plants, milkweeds and Senecio among others. He was easily the foremost American authority in this field and enjoyed the confidence of live-stock breeders, to whom he was of constant assistance. He had nearly finished his work on bighead in sheep and had for the first time demonstrated that certain plants are responsible for this serious condition, which annually causes large economic losses to breeders.

Quiet and unassuming, he was indefatigable in pursuing his researches and possessed an unusually complete knowledge of the western stock ranges and practises in live-stock raising. He was a member of the Washington Academy of Sciences, the Biological and Botanical Societies of Washington, Illinois Academy of Science, Wisconsin Academy of Science and Sigma Xi, and was a fellow of the American Association for the Advancement of Science.

J. F. C.

CHARLES DWIGHT MARSH

BIOGRAPHICAL facts concerning eminent men of science are too often lost to posterity through failure of those who have such facts to preserve or record them. This is true not only of the usual biographical details but also of the equally important but more evasive particulars of a man's personality—what others thought of him, what were his aspirations and bents and what he was to the world and to his community as well as to his scientific colleagues. Even