

MEDICAL EDUCATION

THE EDUCATIONAL PREPARATION FOR MEDICINE*

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Before we can discuss intelligently the educational preparation for medicine, or, indeed, for any profession, we should endeavor to formulate as clearly as possible the function of education and what it is intended to accomplish. Two views are possible. In the first place we may regard education as definitely utilitarian; in other words, as being primarily for the purpose of affording preparation for the special calling or profession in question without regard to any general cultural value it might possess, deeming only such knowledge essential as may be useful to the attainment of the desired end; or, on the other hand, we may consider the fundamental purpose to be mental training, and while certain utilitarian studies form a necessary part of the scheme, the main object is to afford mental culture and discipline.

The distinction between these two educational theories is very ancient. Aristotle says that

"No one knows on what principle we should proceed. Should the useful in life, or should virtue, or should the higher knowledge be the aim of our training,"

and in maintaining that education should not be directed towards utilitarian ends alone, he makes the acute remark that

"Nature herself, as has been often said, requires that we should be able not only to work well, but to use leisure well."

Education should aim to afford a clear understanding of our relation to the world, organic and inorganic, from which we spring and in which we live, and of the social world of which we are a part and in which we move and have our being; it should aim to develop all of our faculties, each to its fullest capacity, recognizing that the most efficient machine is one whose several component parts run

smoothly and in harmony, but not losing sight of the fact that the mind is something more than a mere machine, and that love of the good and appreciation of the beautiful are as justifiable ends as the quest of the true; it should aim to enable the student to discover for himself his likes and dislikes, his attractions and repulsions, his aptitudes, his powers and limitations, that he may be in a position to choose wisely the special medium through which he may express himself to the best advantage, how he may make his life, so to speak, in the highest degree articulate. Education should stimulate creative imagination, should train and exercise the logical faculty and develop the capacity for independent thinking, should strengthen the will, and withal should provide the emotional stimulus which may be required to activate the latent energy of the mind and give a dynamic expression to potential power.

Every boy has ambition, latent or active, and not the least important function of education is to give it direction and to inspire the right kind of idealism. The spur which forces ambition to assert itself does not operate through reason, but through the emotions, and literature is the medium of its expression. In beautiful metaphor Carlyle expresses a fundamental truth when he tells us that

"Without the music of some inspired Orpheus was no city ever built, no work that man glories in ever done."

And while he may hesitate, and justly, to accept this philosopher as a reliable guide, we can not forget that Tyndall, one of the clearest thinkers of the Victorians and a master of experimental science, testifies to the practical value of emotional stimulation when he informs us that Carlyle and Emerson made him a physicist through the inspiration of their writings, and he adds that if a man but observe himself he will probably find that

"In nine cases out of ten the emotions constitute the motive force which drives his intellect into action."

Only a few months ago another practical scientific worker better known to men of this generation, Sir Ronald Ross,

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adduced further evidence of the value of the emotions to scientific achievement in his address on "Science and Poetry" delivered at the Royal Institution last June.

The range of problems which confront the medical student and the physician requires that he should have a broad and comprehensive mental training and a varied mental equipment, and in discussing what kind of education best may fit him for his work, we should look beyond the period of undergraduate study and take account of the social, economic and psychological problems he will encounter when he enters the arena of life. The living human being is not reducible to mere physical and chemical reactions; he is a psychological being as well, and is the product of a long and complex heredity modified by his peculiar social environment, an understanding of which facts is essential not only to the proper handling of patients, but to the comprehension of the social and economic bearing of pathological conditions.

In answer to the question which arises at this point as to what course of study is best adapted to accomplish these ends and to qualify the student for his life work, I wish to express my own deep conviction that a literary and classical course of study enriched and broadened by science is the ideal, and I would add that early specialization, while it may, indeed, save time, which is its purpose, leaves little opportunity for the cultivation of those qualities of mind which may be classified broadly as the emotional and which is best accomplished during the plastic and impressionable period of mental growth. It is a mistake for a youth to decide upon his life's work and enter upon special preparation therefor before he has given his mind a chance to grow in all dimensions, and I feel that our minimum requirements tend to encourage this very thing. I appreciate fully the necessity of our present course under existing conditions, but it is not sufficient and satisfactory and should not be advised except when unavoidable.

For a long time the classics constituted the only foundation of liberal education, but with the growth of the sciences in the last century there developed a strong feeling against the study of the ancient languages as a useless waste of valuable time.

I am convinced, however, that when properly taught the study of these languages affords a mental discipline that is difficult to replace besides giving a kind of culture which can be obtained from no other source. To quote Tyndall again:

"If I except discussions on the comparative merit of Popery and Protestantism, English grammar was the most important discipline of my boyhood. . . . But knowing the value of English so well I should be the last to deny, or even doubt the high discipline involved in the proper study of Latin and Greek."

It is necessary to insist upon the proper method of teaching in order to derive the highest value. When I was in college I was fortunate in having an old German professor who possessed a rare genius for teaching, and I am confident that I do not overestimate the importance of the mental discipline received from his drill in Latin and Greek. I learned concentration, accuracy of observation, attention to detail, analysis and synthesis, and these mental habits went with me later into the laboratories of science and found a practical application in a wholly different field. But this was not all. Besides receiving mental discipline, contact with the literature in which the ancient culture of Greece and Rome found expression, gave me broader and deeper human sympathies as well as a better understanding of our own social environment and enriched my life by affording a juster appreciation of the beautiful in literature and in art, and lastly but by no means least, it gave me a truer knowledge of the structure and use of our own language and a finer appreciation of our incomparable literature.

These ends can not be attained in the same degree by the study of a modern foreign language, although if thoroughly taught modern languages have the added advantage of being more definitely utilitarian. If a modern language is to be a prerequisite for the study of medicine, we should specify not the length of time of study in units, or in years, but that the student prove that he has acquired a reading knowledge of the language in question. A short course is not justified, by either its cultural or its utilitarian value.

It should not be necessary to comment upon the importance of a more thorough training in English language and litera-

ture, but my experience with young men who have finished a college course, in part or in whole, convinces me that sufficient attention is not given to this fundamental branch of study. A knowledge of English is basic. While it is true that every one can not acquire equal facility in its use, every one at least can learn correct English, but I fear it is a just commentary upon educational methods that many college-bred students do not understand the use of their own tongue.

A word here about the study of biology may not be out of place. Biology may be considered as having both cultural and utilitarian value. I do not think that any scheme of education is fully entitled to be called liberal which omits a subject which has revolutionized thought in every field of human activity, modifying profoundly even some of our most deeply rooted religious beliefs, whose fundamental laws permeate the entire social structure and illuminate many of its perplexing problems, as well as constituting an essential part of the foundation of medicine which is but one expression of applied biology. In requiring biology, however, as a part of the preparation for medicine it seems to me that we should insist upon the kind rather than upon the amount of biology that is taught. The student should learn the general laws of plant and animal life, the principles of evolutionary development, the principles of heredity, the structural as well as the genetic relationship between man and the lower animals, with laboratory demonstrations illustrating the principal types.

It is not the purpose of this paper to mention in detail all of the subjects which might find a place appropriately in a plan of liberal education, but I should like to refer to sociology and psychology which have a very definite application to medical practice. The organization and development of the body social and the laws which govern mental operations appear to me to be highly important fields which have not been sufficiently cultivated. If psychotherapy is to be properly understood, the principles which underly its application must be predicated upon a knowledge of the general principles of psychology.

Enough has been said to indicate my belief in the importance of a broad and

comprehensive culture rather than a training which begins a special direction too early and also in a general way my views of what such a course should consist. The most serious difficulty which I see to an education that is planned on these liberal lines is the length of time that will be required to carry it out. The average young man who studies medicine after completing a full academic course of study and further prepares himself by a year or more of internship is well beyond the middle of his third decade of life before he is in a position to earn a livelihood. This is necessarily a serious drawback, but let us not make the mistake of sacrificing too much of culture to save time. In order to abridge this lengthy period and to shorten the course of study without depriving the ambitious student of the opportunity of obtaining an academic degree, the combined course is offered by a number of colleges under the terms of which the student enters the medical school at the end of two or three years of college work, and receives the B.S. or B.A. degree together with his degree in medicine at the expiration of his professional studies. This, however, fails to meet the real difficulty and is of very questionable value. The medical course undoubtedly possesses a high cultural value, and if properly pursued is a liberal education in itself, but it does not meet the ends of academic instruction nor is it intended to do so. I feel, too, that the combined course tends to set up wrong standards of value and to create in the students' mind the idea that the goal to be reached is the degree rather than the culture which the degree symbolizes. Furthermore, if six or seven years of combined study possess a culture value represented by the A.B. or B.S. degree in addition to the medical degree, should not two additional years of culture study entitle the student who takes his B.S. or B.A. degree before entering upon the study of medicine to a higher degree, at least to the degree of M.A.? Is it quite fair to draw no distinction between the culture of a young man who leaves college at the end of his sophomore year and that of a young man who pursues to its completion the full academic course before entering the medical school? Personally, I

do not think that these two stand upon the same culture level and that some distinction should be made between them.

The real difficulty of the situation, in my opinion, lies in the primary and secondary schools. While I am not prepared to offer a definite suggestion with regard to what changes may be required or may be practicable, I am impressed, nevertheless, by the feeling that precious time is wasted in these preparatory years and that it may be possible to shorten the term of school study, and at the same time perhaps to enlarge the field so that the student may be prepared to enter college at sixteen or seventeen. This is not infrequently done in selected cases by intelligent direction and I believe that by employing different methods from those in vogue it can be accomplished with the majority of pupils.

Our present methods of teaching do not seem to inspire boys and girls with the proper ideals. A teacher whose education was received in Europe remarked after teaching a short time in an American college that in Europe boys studied to learn, but in America the object of study seemed to be to pass examinations, the pupils not appearing to care anything about learning. Is not this a natural result of a system which is too mechanical and which consequently tends to create false standards? I realize fully the value of standardizing our teaching and of adopting a uniform terminology by which to express these standards, but the human mind is very prone to fall a victim to the fallacy of mistaking the symbol for the real substance, illustrations of which are fairly abundant. The unit system which is employed almost universally in this country is a convenient means of expressing the amount of work done and its educational value. It is a useful language which all of us understand and which makes communication easy, but I fear the student has come to regard the unit as the real end instead of its being merely a symbol which represents a certain substance of knowledge. A number of colleges admit students from selected schools upon certificates declaring that the necessary number of units has been secured, proof of which is submitted in the form of a state-

ment that the student has spent the required number of periods of proper length in the required study and has attained the required grade, thus confirming him in the belief that the certification of units is the end for which he has been working instead of knowledge and culture. If proof of knowledge and of mental training by means of examinations were required in every instance it would keep before the pupil the right ideal of attainment and necessarily improve the quality of his work. I do not wish to be understood as advocating the abandonment of so useful a device as the unit system. I am merely pleading for its proper employment and trying to drop a word of caution against a danger which I think I see in its application.

In conclusion, I wish to suggest that medical colleges be given a larger allowance of discretionary power in administering entrance requirements. The chief ends of education are mental training and the acquisition of an adequate mental equipment for the work to be undertaken and these things can not be measured by hard and fast rules. The applicant who has gone through a high school and has spent at least two years in college, but is short one or two units of biology, for example, may be better qualified than another who has attained the requisite number of units. His superior qualifications may depend upon the mental training acquired in other studies or upon a course in biology which, though shorter, may, nevertheless, better qualify him for grappling with the problems of medicine because of its more practical character. Until we have some way of knowing what a unit in biology means, the colleges should have the privilege of interpreting its value in individual cases. This is likewise true of other studies such as chemistry and physics, though in a lesser degree. While the teaching of these subjects is more accurately standardized and consequently the unit valuation more definite than that of biology, here, too, we should have some margin of discretionary power in evaluating the mental equipment and capacity of the applicant.

DISCUSSION

Dr. John T. Halsey, New Orleans, La.—Intending medical students, while well informed as to minimum or required preliminary education, have, in general, not been advised or instructed as to what type and scope of general education will best fit them not only for the study, but also for the practice of their profession. It is eminently desirable that this information and advice should be given while they are at high school or college. This could be done by the various councils and committees on medical education. Something could also be accomplished by the inclusion in the bulletins or catalogs of our medical schools of one or several paragraphs containing such advice.

Chancellor J. H. Kirkland, Vanderbilt University, Nashville, Tenn.—No one will venture to differ with Dr. Wilson in his claims for the necessity of extensive preparation for the study of medicine. No knowledge is too great, no attainments are too high for the future physician, but the discussion of such requirements as an academic question is one thing and the consideration of actual conditions is another.

I take it as established that the present requirements of the medical colleges will not soon be changed. Two years of college work is all that can be demanded; possibly it is all that should be required. At the same time it is well for some institutions of their own accord to require the completion of a four-year college course. These institutions represent ideal requirements and should be encouraged.

If we hold fast to the present requirement it is questionable whether much more can be done than we are now doing. Some improvements in work can be made. It would be of advantage if the pre-medical students could be put into special sections where their needs would be provided for, and where the contents of courses could be arranged more definitely to cover the best possible preparation for medicine. Medical colleges are under obligation to select their medical students from institutions giving special attention to the needs of pre-medical students. These students must not be taken at random from inferior colleges of all kinds with inferior courses.

Another suggestion is that a few institutions should introduce a three-year course as preparatory to the study of medicine. This three-year course could be made far superior to the present two-year college course, and if the institution desires to do so the degree of bachelor of science or even bachelor of arts might be given to the student after completing three years of college work and two years of medical work. Such an arrangement would provide better preparation for the study of medicine than the ordinary college course of four years.

Dr. Lewellys F. Barker, Baltimore, Md.—Dr. Wilson has set up an ideal toward which we may well work.

The education of the medical student before he enters the medical school should include preparation for life as well as preparation for medicine. Moreover, no student is prepared for medicine who is not also prepared for life; but there is an especial preparation for medicine that must

be superimposed upon the general preparation for life.

There should not, in my opinion, be any increase in the minimal requirements for entrance to medicine at present, for the supply of medical students is too small now rather than too great. We should encourage more men to enter the medical profession.

Though the minimal requirement should not be increased, we should encourage young men of unusual ability to secure an educational equipment beyond the minimum. Men of superior ability will especially profit by such additional preparation.

What Dr. Wilson has said about the training of the emotions and the will as well as training of the intellect, seems to me particularly important at this time. For in medicine as much as in other walks of life, character is fully as important as intellect.

Dr. Tom A. Williams, Washington, D. C.—The consummation of Dr. Wilson's plan of medical education is devoutly to be wished when the ideal state which many of us have in mind is attained; but in the mean while, where are we to find doctors for the rural districts? Men trained in universities for so many years are disinclined to the kind of life the country doctor must lead. Indeed, too many of them too strongly desire to specialize and do so far too early in their medical life. Further, a taste seems to develop for administrative work if we are to believe the statement that of one famous school only 6 per cent of the graduates of the first ten years are now actually practicing medicine; and that of the graduates during the same period of a much older famous school only 2 per cent are in active practice. Of course men must be trained for teaching, research and administration, but not at the expense of the training of practitioners.

A modification of Dr. Wilson's plan seems, therefore, imperative for present needs. While agreeing that the humanities and other broadening subjects are highly desirable acquisitions for a practicing doctor and greatly add to the community good he can perform, and while agreeing that rural interests should not be neglected if modern civilization is to be maintained, yet the doctor's prime function in the eyes of the family is the care of the sick; and no matter how extensively penetrated by hygienic ideals we become, yet surgical and medical emergencies will always arise and chronic disease will always exist. Hence the practitioner must primarily be a technician. Too many, alas, are nothing more than this, but they are better than nothing at all.

I propose, therefore, that the high degree of cultivation aspired to in Dr. Wilson's scheme of education be postponed until after qualification in purely medical science and practice. In order to do this the plan would be somewhat as follows:

Although boys who are going to study medicine should have completed the present high school course at sixteen, we must deal with conditions as they are that the boys are not ready for college until seventeen or even eighteen. They should come there, however, with a preliminary knowledge of chemistry, physics, biology and at least one modern language. The college

course they pursue should be part of their medical course and not one of general culture; for one year is as much as should be spared for it. In that year should be studied the fundamentals of the aforesaid sciences, physics, chemistry and biology, including bacteriology, with particular reference to their application to the problems of human physiology, and the study of general morphology should include the introduction to human anatomy.

In the second year an intensive study of human anatomy, histology and physiology, including chemistry and pharmacology, should be begun, and this should continue through the third year, during which it should also comprise the anatomy and histology of morbid states and the study of the alteration of the physical signs these produce in the living body, including all special forms of instrumental inspection, the introduction to this being via surgical pathology. Toward the end of the year the highly complex physiology of the nervous system should be extended to include the kind of reactions we call psychological.

In the fourth year the application of these principles to the study of disease based upon general pathology should be begun and a sound knowledge gained of the data and principles of medicine, surgery and obstetrics; while in the fifth year the application of these principles the actual study of patients, more particularly in the dispensary, should be highly intensified, while at the same time an insight into neurology, and psychiatry should be insisted upon, as well as some acquaintance with the work comprised in such of the regional specialties as the eye, ear, nose, throat and pelvis. The application of the various facts to public health and to medical jurisprudence, comprising the elements of sociology, should also be insisted upon during this last year, at the end of which graduation is permissible. At least six months of hospital internship should then be obligatory.

A new factor is now introduced, viz., the obligation of every medical graduate to practice in the country for a minimum of three years. After this period he should be eligible to enter the post-graduate courses, included in which are the cultural studies proposed by Dr. Wilson as foundations of the medical course.

That is to say that the supply of doctors to the rural districts will be the first charge of the state. Such arrangement, however, would benefit not only the rural districts by bringing into them young active men with new ideas, but would benefit the doctor himself by placing him in a situation where he is forced to compensate for the present weaknesses of medical education as set forth in a previous communication (*SOUTHERN MEDICAL JOURNAL*, October, 1920). In the country he is obliged to rely upon his own resources rather than upon the laboratory and consultants. He is forced to follow difficult cases instead of immediately turning them into a hospital. Besides, his humanistic functions are appealed to in a way impossible when he is only a small cog in the large group of the hospital.

At the end of the probationary period of three years many men, having developed a taste for country life or having family ties, will elect to

remain rural practitioners, a breed we can not afford to lose. To the others the opportunity of further development will be offered by the provision of residential appointments in hospitals or dispensaries in the large cities, where they will at the same time follow post-graduate courses in order to develop into consultants, and specialists if they are fitted and choose. These courses must include the broad perspective given by the study of human history, including languages and philosophy, with their modern extension into sociology and psychology. The period of study should be at least two years, at the end of which time maintenance should cease and a junior visiting hospital or dispensary appointment should be sought in conjunction with private practice or teaching as circumstances or tastes dictate.

Thus, a boy entering medical school at sixteen would be qualified for rural practice at twenty-one and a half. Having exercised and matured in three years of independence, he is at twenty-four and a half a man much more fitted to profit by the culture given by the large university; and even then he is only twenty-six and a half by the time he is a man of considerable perspective as well as technical proficiency for beginning practice in one of the more highly trained functions of the medical art.

Under the present method of primary education, however, one to two and a half years must be added to these ages, but even then we shall be no later than is the case in such a country as Norway, where eleven years is required for the medical course, and we shall have avoided the drawback of academizing our men by the expedient of the three years' rural practice, beside which the economic advantages to the individual are an important consideration. The gaining of the livelihood during these three years has a further advantage of a moral kind, viz. increase of independence of spirit and the avoidance of the habit of tutelage which prolonged academic life fosters.