

HISTORY OF MEDICAL EDUCATION*

BY

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"From the earliest times, medicine has been a curious blend of superstition, empiricism, and that kind of sagacious observation which is the stuff out of which ultimately science is made. Of these three strands—superstition, empiricism, and observation—medicine was constituted in the days of the priest-physicians of Egypt and Babylonia; of the same three strands it is still composed. The proportions have, however, varied significantly; an increasingly alert and determined effort, running through the ages, has endeavoured to expel superstition, to narrow the range of empiricism, and to enlarge, refine, and systematize the scope of observation. . . . The general trend of medicine has been away from magic and empiricism and in the direction of rationality. . . ." (Flexner, 1925).

The quotation above is from Abraham Flexner's well-known monograph on medical education, and I repeat it here because it expresses so succinctly the broad sweep of medicine from its beginnings to the present day, when the teaching of the art is of sufficient import to bring together at this World Conference men who are concerned with all its phases and implications. From the days of the early priest-physicians the teaching of medicine has had a highly personal flavour, and this close physician-pupil relationship has persisted until modern times, varying in degree as times have changed, but never altogether disappearing. There are many in this era who lament the fact that the personal tie between teacher and pupil no longer plays so vital a part in medical education, and they would urge a return to the earlier mode of teaching.

Ancient Precepts

In early Sanskrit medical literature there emerges through the mists of Hindu legend an eminent physician named Charaka, who, like Hippocrates, was a great teacher and an indefatigable writer (Puschmann,† 1889; Jelliffe, 1906). In his commentaries on the *Ayurveda* (c. 500 B.C.) he admonishes young men who propose to study medicine to find a good teacher—one "whose precepts are sound, whose practical skill is widely approved, who is clever, dextrous, upright, and blameless; one who knows also how to use his hands, has the requisite instruments and all his senses about him, is confident with simple cases and sure of his treatment in those which are difficult; of genuine learning, unaffected, not morose or passionate, and who is likewise patient and kind to his pupils" (Lakshmi Pathi, 1944). This is one of the earliest statements of the pupil-teacher relationship in the literature of medicine, but no doubt there were many other great teacher-physicians in China, Egypt, and among the Jews whose views about the training of students have not survived.

The medical literature of Greece and Rome, however, gives detailed insight into both the principles and the practice of student education; here the source materials become

vast (Drabkin, 1944),‡ for the Greeks were much concerned with education and wrote of it at length. In the period before Hippocrates, Greek traditions had begun to spread westward. Thus in the fifth century B.C. a medical school was already established at Croton, in southernmost Italy (on the instep of the Italian boot facing North Africa). Here flourished another figure, Alcmaeon, who, like Charaka, is known nebulously through the writings of others. From Theophrastus it is learned that Alcmaeon was a neurophysiologist—the first of whom there is record. Theophrastus states that he carried out experiments on the brain and spinal cord of living animals and that he distinguished between sensory and motor nerves; indeed, some believe that he had even grasped the concept of the reflex. Alcmaeon is said to have attracted many students and to have carried out anatomical dissection and demonstration (Stella, 1939).

Throughout the Greek world, medical education was based more on experience than on book learning, practical training generally being acquired from a physician-father, or by an aspiring student apprenticing himself to a practitioner for a period of years. Books were used, but only as adjuncts, and they never replaced practical experience. There is an interesting passage in the *Laws* of Plato in which distinction is made between the training of free doctors and those who are merely to become their assistants. "All bear the name [of physicians]," he wrote, "whether freemen, or slaves who gain their professional knowledge by watching their masters and obeying their directions in empiric fashion, not in the scientific way in which freemen learn their art and teach it to their pupil" (Taylor, 1934; *Laws*, 720).

The spirit of the student-teacher relationship is also well exemplified in the Hippocratic Oath: "To hold him who has taught me this art as equal to my parents and to live my life in partnership with him, and if he is in need of money to give him a share of mine, and to regard his offspring as equal to my brothers in male lineage and to teach them this art—if they desire to learn it—without fee and covenant. . . ." The Oath also distinguishes between general precepts and practical instruction, such as that derived from attending a physician on his rounds and observing and helping in the temple where he sees his patients.§

The apprenticeship system spread to Rome and persisted there long after formal schools of medicine with regular course work had been established. According to Galen, anatomical dissections were sometimes carried out by students in early childhood under the direction of a father-physician. Galen adds significantly that when childhood dissection was given up it became necessary to have written manuals of instruction (Drabkin, 1944), which led to a gradual standardization of medical instruction throughout the Roman world and the establishment of medical schools offering lectures and obligatory dissections (usually on animals), sometimes carried out by the student himself, but more usually by a teacher or demonstrator. During this time there was a gradual separation of medical theory and practice, and little by little instruction in surgery became divorced from that of medicine.

Both in Greek and in Roman medicine great emphasis came to be placed on the scientific approaches. As Sir Richard Livingstone (1944) has said so eloquently, "Science

†Drabkin (p. 350) points out that, while more in the way of medical writings have come down to us than in that of any other field of ancient literature, the greatest part of medical literature as such has failed to survive. No attempt can be made to estimate how many thousands of books have been lost, but Drabkin cites one instance of an unnamed doctor who wrote 256 books and not a fragment of any one of them survives. All of which points to caution in any type of historical reconstruction such as that of early medical education.

§The age of the Oath has been disputed, some having maintained that it probably antedates Hippocrates himself—i.e., sixth century B.C. (Puschmann, 1889)—but Edelstein (1943) believes that it comes from the fourth or fifth century B.C.

*An address given in the plenary session of the First World Conference on Medical Education on August 24.

†In tracing the early history of medical education one inevitably turns to Theodor Puschmann's scholarly treatise, published at Leipzig in 1889, *Geschichte des medizinischen Unterrichts von den ältesten Zeiten bis zur Gegenwart*. In 1891 Evan H. Hare, F.R.C.S., gave an admirable English rendering under the title, *A History of Medical Education from the Most Remote to the Most Recent Times*.

profoundly affected Greek thought but did not alter the conditions of Greek life, and we have the spectacle, so strange to us, of men profoundly interested in it but almost unaware of its practical uses. To the Athenian thinker—a fact curiously overlooked in much classical English education—scientific study was essential to the educated life. . . . Half of Aristotle's writings are on the same subject (science); and every Greek philosophic system, except Cynicism, has its physics as well as its ethics."

Mediaeval Times

The first school of medicine of mediaeval times came into existence, probably in the ninth century, on the shores of the Tyrrhenian Sea, in the town of Salerno. Tradition has it that the school was founded by representatives of the four cultural forces which had persisted through the Middle Ages—a Greek, a Latin, a Jew, and an Arab. Few traces now remain of this once flourishing centre of medical thought; however, its published texts, such as the *Regimen of Health (Regimen Sanitatis Salernitanum)*, bear eloquent testimony to the virility of a great school of learning. Prominent patients, as well as innumerable students, came to Salerno from far and wide, even from as far north as Germany and Denmark. One student, Gilles de Corbier, from Paris (c. 1200), returned to become private physician to King Philippe Auguste, and it was Gilles among others who proclaimed with tongue and pen the fame of Salernian medicine.

Some details are known about the mode of teaching at Salerno. In anatomy, for example, students dissected various animals, including pigs and monkeys, and they likewise attended formal demonstrations. Although much disputed, tradition holds that Salerno was the first school to admit women for medical training, and there are still those who believe that the author of the celebrated mediaeval treatise on diseases of women, *Trotula*,* was one of its graduates. "Mythoclasts" of the Sudhoff school—as Osler called them—have ungallantly tried to deprive *Trotula* both of her sex and of her position in history, but the late H. P. Bayon (1940) has found evidence in extant *Trotula* manuscripts that a thirteenth-century author bearing the name of "*Trotula*" clearly existed and that almost certainly she was a woman; but Dr. Bayon was not prepared to proclaim her the first female professor in a modern university.

While Salerno was developing its traditions of medical teaching, in far-away China, during the Sung dynasty (960–1280 A.D.), when Korea was first invaded, the position of court physician became stabilized, and to him was given the task of instructing students in the canonical books of medicine. During the Mongol dynasty (1280–1368), the Emperor Khublai introduced medical examinations and a system of licensure based on examinations, while in the Ming dynasty (1368–1644)—when Korea was again invaded—the Medical College of Peiping was founded, the first medical school in China (Castiglioni, 1947, p. 106).

By the twelfth century, in Europe, men trained at Salerno began to found schools elsewhere—in France, Spain, Portugal, and England; the earliest were those of Paris and Montpellier. The exact time of founding of these schools is in no case clear, but we know that Adalbert of Mayence studied medicine at Montpellier in 1137.†

There were three outstanding teachers connected with Montpellier—Arnold of Villanova, Henri de Mondeville, and Guy de Chauliac. Since Montpellier was situated near the Spanish border the receding tide of the eighth-century

Arab invasion had left its mark in this part of France, and it was inevitable that the teachings of these physicians would show a strong Arabic influence. Arnold of Villanova was well travelled and widely read, and he was one of the most prolific writers of the Middle Ages. Henry de Mondeville, also dominated by Arabic influence, was an excellent practical surgeon whose success was in no small part due to the fact that he was a keen observer. The most influential of the Montpellier trio was undoubtedly Guy de Chauliac, whose textbook of surgery, one of the most important of the late Middle Ages, was reprinted far into the seventeenth century and often in vernacular tongues. Both Mondeville and Guy de Chauliac were practical men who appreciated the value of training their hands both for diagnosis and for the operations of surgery, but too little is known about their actual teaching methods to warrant more detailed consideration here.

A contemporary of these men who was earning an equally distinguished reputation as a writer and teacher was Peter of Abano, who was one of the first of the great physicians of the school of Padua. Sir William Osler (1921) points out that 8 of the 182 medical books printed before 1481 were from his pen, and from this we can judge his influence not only upon his contemporaries but on the history of medicine. Medicine of the Middle Ages was of course closely aligned with theology, and, since the clergy were the most learned men of the time, two of these must be mentioned in passing for the tremendous influence they exerted in turning men's minds towards scientific approaches to the facts of nature. The first was Albertus Magnus, who so magnificently interpreted Aristotle to his generation; the second Roger Bacon. Albertus Magnus was a man of encyclopaedic learning whose paraphrase of the natural history of Aristotle became the basis for all subsequent Aristotelian studies. His medical works were also widely known, and, while he inspired many, his greatest pupil was Thomas Aquinas.

Roger Bacon was one of the first to lay stress on the importance of acquiring knowledge through original research rather than from existing authorities, but his contemporaries had little appreciation of his practical philosophy, and he himself lacked the ability to put his teaching into practice. The result is that readers of to-day find a refreshing modernity in his writing.

The Renaissance and After

The fifteenth century marks the renaissance of the great Italian schools, especially those of Padua, Bologna, Ferrara, and Pisa. In the following century students went over the Alps in great numbers, and in each university formed themselves into "nations"; thus we find Fabricius of Aquapendente dedicating his celebrated treatise on the valves in the veins to the "German nation"—confusing indeed if one did not know that he was addressing himself to a particular group of attentive students who had seen him demonstrate, even as had William Harvey, these important venous structures, which ultimately led Harvey to the discovery of the circulation.

Many of the practising physicians in England during the fourteenth and fifteenth centuries had studied medicine in the good Continental universities—Padua being the most popular until the religious difficulties of the late sixteenth and early seventeenth centuries caused English students to turn to the Protestant schools of Switzerland and Holland, especially Leyden, where Boerhaave's medical clinic had become celebrated. It is true that "physic" was taught at Oxford and Cambridge, but instruction was usually theoretical and success involved gaining a verbatim knowledge of ancient writers, such as Galen and Hippocrates and a number of the Salernian texts. The popularity of the Continental schools was such that Parliament made into a law in 1421 a petition from the English universities that graduates of foreign schools must become "incorporated," with an M.D. either from Oxford or Cambridge before they could practise medicine. This ultimately became a routine procedure (Allen, 1946).

During the next century the need for a system of licensure became increasingly apparent, and in 1518 Thomas Linacre,

**Curandarum Aegritudinum muliebrum ante, in et post partum liber unicus*; known also by its subtitle, *Passionibus mulierum curandarum*. The text was first printed in 1544 by Schottus of Strassburg, but the later text, published by the Aldines in 1547, is the one usually followed. An English translation by Elizabeth Mason-Hohl was published in 1940 under the title, *The Diseases of Women by Trotula of Salerno* (Ward Ritchie Press, California).

†In addition to following the example of Salerno in the teaching of anatomy and surgery, Paris and Montpellier also stressed medical botany; thus the French physician Odo Merndon (c. 1130) probably wrote the famous poem *De vribus herbarum* in two thousand Latin hexameters (generally attributed to Macer Floridus), and there were many other writings in the field of medical botany dating from this period.

who had studied in Italy (for 12 years), founded the Royal College of Physicians under charter from Henry VIII. Recognizing the need also for medical chairs, Linacre established three medical lectureships—two at Oxford, one at Cambridge—and in due time the first two of these lectureships became the Regius Chairs of Medicine at Oxford and Cambridge. Linacre's second lectureship at Oxford bore his own name and still survives (Chaplin, 1919).

Another prominent advocate of a more modern approach to medicine was Linacre's near contemporary, John Caius, who had brought back from Padua the teachings of Vesalius. As Master of Gonville College he endowed three fellowships—two for medicine—and twenty scholarships, and Gonville and Caius College, as it later was to be known, came to be the centre of medical study at Cambridge.

Period of Transition—1600—1800

As the "New Learning" of the sixteenth century transformed scholarship in the western world, so the "Experimental Philosophy" of the seventeenth gave new life both to medicine and to science. Bacon had set the stage in his *Advancement of Learning*, and Harvey, a short time later, became the centre of that stage through his monumental discovery of the circulation; but the full meaning of the Harveian discovery for medical science and teaching was not fully appreciated until later in the century, after the Royal Society and the other scientific academies in Europe had been founded. Then came two remarkable figures, both Englishmen, who left their distinctive mark on medical education—the one in theory, the other in practice. To quote Sir George Newman (1918, p. 21):

"Locke and Sydenham . . . taught that, over and above the university spirit and a university standard of learning, the medical student requires (i) a training in observation and the inductive method, (ii) exercise and practice in his craft, and (iii) some apprehension of the *rationale* and laws and limitations of Medicine. His dormant faculty of observation will be awakened in his preliminary study of science, and indeed all through his medical curriculum it can be trained and stimulated to become a talent and a habit of keen, serious, patient, continuous seeking, of honest perceiving and of valid reasoning. The student must also have ample opportunity of everyday practice. Medicine is the art of healing not less than the science of disease. 'Our art,' wrote Sydenham to Dr. Mapletoft, 'is not to be better learned than by its exercise and use'—not an exercise of healing only in the sense of curing a particular patient, but of learning from each patient increased power in the art of healing all similar patients."

In England at the beginning of the eighteenth century a medical education could be secured only in London, Edinburgh, Aberdeen, and Dublin (Chaplin, 1919, p. 17). There were seven of the London hospitals in which a general knowledge of medicine could be obtained, but, except at the London, Guy's, and St. Thomas's Hospitals, formal teaching was much neglected. By far the larger number of students were educated at schools supported by private enterprise. Best known were those maintained by Dr. George Fordyce at his house in Essex Street, Strand, and at Windmill Street, where the two Hunters, Hewson, Cruikshank, Baillie, and Wilson combined forces. Attendance for a period of time at the lectures of men such as these enabled an aspiring surgeon to present himself for examination to the Corporation of Surgeons or the Worshipful Society of Apothecaries and, if successful, to receive a diploma. To prepare as a *physician*, on the other hand, involved a much longer course of study. The student must have a degree from some university, and, if he wished to practise in London, must pass the licentiate examination of the College of Physicians. This was obligatory for all physicians who wished to practise in the provinces, except graduates of Oxford and Cambridge. To qualify as a licentiate a candidate, according to Chaplin (1919), had not only to prove himself familiar with the principles of medicine but also to exhibit some general "erudition and culture." (See also Chaplin, 1920.)

In the early nineteenth century students began to find their way more often to the French schools, where Corvisart,

Laennec, and Louis were the harbingers of modern medicine. Louis in particular, with his statistical approach to medical problems, exerted a strong influence on many young men from America, who were to return and become the medical educators of that time. Later in the century it was Germany which attracted some of the best of the younger minds, for it was in Germany that practical laboratory teaching was first established within the universities. In these laboratories the sciences of chemistry, physics, pathology, physiology, and eventually bacteriology reached a mature status through the efforts of men such as Liebig, Helmholtz, Virchow, Müller, Cohnheim, and Ludwig (Fulton, 1950).

Developments in North America

Medical education in America was of course strongly influenced by both the French and the German systems of teaching, but the earliest influences stemmed from Edinburgh and London. The apprentice system which obtained in America from the beginning had been brought from England, with all its virtues and shortcomings. The inadequacies of the system were soon recognized by the enlightened physicians of the Colonies, and in the eighteenth century the more ambitious of those wishing to enter the profession of medicine made the hazardous journey to Edinburgh, London, Paris, or Leyden to complete their training. One of these, William Shippen the younger, returned to his native Philadelphia after a sojourn of five years abroad and began a series of lectures in midwifery and later in anatomy (Flexner, 1910). When his friend and fellow student, John Morgan, returned from his study abroad, he, Morgan, carried into effect the plans they had made together in Edinburgh—to found a medical school at the College of Philadelphia.

In an address delivered at the graduation exercises of the College in 1765 he proposed the creation of a professorship in the theory and practice of medicine. This celebrated discourse, still pertinent to-day, was entitled: *A discourse upon the institution of medical schools in America; delivered at a public anniversary commencement held in the College of Philadelphia May 30 and 31, 1765*. Morgan himself was appointed to the chair of medicine, William Shippen and Benjamin Rush being appointed at a later date. This school subsequently joined with the school of the University of Pennsylvania, and has continued to the present day (Klickstein, 1953). In 1813 a school of medicine was founded at Yale College, making five schools of medicine in the United States—and at what is now Columbia University, Harvard, and Dartmouth. Unfortunately, however, the sound ideals on which these schools were founded were in large measure lost sight of in the next century. Schools of medicine without university affiliation began springing up everywhere, and, as the numbers increased, the quality of the education they offered sharply decreased.

During the eighteenth century there was still no system of licensure in North American schools, and while some schools granted the M.D. or M.B. degree, usually after a period of two years' study, there were many apprentices, as there were in England during the same period, who announced themselves as practitioners without formal qualifications. The state and country medical societies eventually insisted on licensure, and by 1821 the state of Connecticut, through its medical society, had set up a board of medical examiners, and they forced all unlicensed practitioners to take the state examinations. This movement spread to other states and through the initiative of the New York Medical Society the American Medical Association was founded in 1847 with the end in view of raising standards of medical education on all fronts: requirements for admission to medical schools, examinations for licensure—this and much else, all duly recorded in a historical monograph by the founder of the Association, Nathan Smith Davis (1877).

During these years, despite the deplorable conditions in some of the so-called medical schools, a number of good

physicians were nevertheless practising and teaching in America, and the better students were well educated at their hands. The establishment of the School of Medicine at the Johns Hopkins University in Baltimore on a true university basis, with four years of college required for entrance, exerted a most salutary influence on the medical schools in the United States. The Flexner report (1910) on medical education and moneys from the newly formed Rockefeller and Carnegie Foundations reduced the numbers of schools of medicine and brought higher standards to those which survived. Graduates of the Hopkins went from there to other schools, taking the precepts and ideals of men such as Welch and Osler with them, and thus the influence spread.

One of these men, Milton C. Winternitz, came to the Yale University School of Medicine in 1917, and, building on the foundation of reform already begun by Dr. George E. Blumer, also a Hopkins graduate, he launched a new curriculum of medical education which has come to be known as "the Yale plan." Under this system the student is placed largely on his own; periodic examinations have been dispensed with, and he is allowed an unusual amount of freedom to pursue his particular interests and to explore the literature to which his lectures have directed him. Qualifying examinations are eventually taken through the National Board of Medical Examiners. This system, although it has been under fire by its critics since it was instituted in the 1920's, has seemingly stood the test of time, and the ideas which were thus given expression by Dr. Winternitz have spread widely—even back to Johns Hopkins and to this World Conference.

Recent Developments

Important history is often being made in our midst, passing largely unrecognized, and this is notably true of the British schools at the present time. In this country the cause of medical education has been notably advanced, not only for British schools but for those of the world at large, by a series of important Government-sponsored studies and reports—those little-read documents that so often represent the best thinking of their time.

Among the earliest was Mr. Henry Warburton's celebrated "Report from the Select Committee on Medical Education," in four volumes, prepared and printed by order of the House of Commons in 1834, in which the views on medical education of many men of British medicine of that period were sought and duly recorded. Thus Henry Holland, who had been Physician to Queen Caroline, stressed his conviction that the Royal College of Physicians should maintain a close affiliation with the English universities. He says, "I conceive that this affiliation has tended to place the profession in England, in relation to general society, higher than in any part of the continent of Europe" (vol. 1, p. 193). Holland thus gave voice to the importance of a university education in medicine. The testimony throughout the Warburton report is of challenging interest because it so frequently gives the *confessio fidei* of some of the most eminent medical leaders of the time—source material, incidentally, of the greatest value from the standpoint of biography. Thus Sir Astley Cooper gave 22 pages of testimony, in which he outlines his view of the ideal educational programme for a surgeon; he spoke with great candour on existing shortcomings, and urged that a year on the Continent should be a *sine qua non* of the training of every young British surgeon.

Of like significance was the Earl of Selborne's Commission of 1889 on the "Advancement of higher education in London," in which men such as Joseph Lister, Richard Quain, Norman Moore, James Paget, and many other prominent London physicians gave their views. In passing it is interesting to note that Lister, after relating at some length many of his own experiences as a student, insisted that he was better able to examine his own students than an examiner from the outside, although an outside examiner was always appointed to sit with him; Lister, however, served as the chief examiner.

Sir George Newman's two reports of 1918 and 1923 have already become classics in the historical literature of medical education, for no one in recent years has described the great issues with broader vision and perspective, and I here refer especially to the section of his first report entitled "A

University Education in Medicine," in which he wrote eloquently upon the theme that a medical school without university affiliation ceases to be a medical school in the modern sense.

Within the past decade there have been two other highly significant reports emanating from British sources: that of Sir William Goodenough's "Interdepartmental Committee on Medical Schools," which appeared in 1944, and the five-year report on "University Development" of the University Grants Committee (covering the years 1947 to 1952), which appeared a few weeks ago. The Goodenough Committee had proposed a vast reform and reorganization of medical education in the British schools, involving increased annual expenditures of more than £2,000,000. Perhaps the most remarkable feature of the report was its insistence upon the establishment of full-time clinical chairs of the Hopkins type for all the major departments, with provision for university stipends of such amounts that it would be unnecessary for the holders to supplement them from outside earnings. It also proposed that a suitable number of full-time readers and lecturers be appointed in these departments, with the expectation that it would be from among these lesser full-time posts that the professors of the future would be recruited.

Nearly ten years have now passed since the Goodenough Committee made its sweeping recommendations, and it is heartening to record that in that interval 55 new full-time chairs in clinical subjects have been created in the recognized medical schools of Great Britain, a fact mentioned with justifiable pride by the University Grants Committee. This committee also records progress in other directions in line with the Goodenough recommendations—for example, the strengthening of postgraduate medical education through creation of the British Postgraduate Medical Federation, and the making of clinical material available for teaching purposes in the non-teaching hospitals (Trueman, 1953).

In my opinion, there are two areas which should receive further attention in the immediate future, not only here but in North America, Scandinavia, and, indeed, wherever medicine is taught: first is the problem of the liberalization and lightening of the entire medical curriculum, the elimination of outmoded and unused areas of instruction, with the ultimate end in view of shortening the curriculum so that an able man may, with adequate training, go into practice and become financially independent and scientifically productive in a period of less than the eight or ten years now regarded as essential. Not long ago a well-known dean with many forward-looking ideas, feeling frustrated after a meeting of his reactionary faculty, exclaimed: "It is easier to move a cemetery than to change the curriculum." It is not for me, an historian, to suggest ways of improving the curriculum, but it will be my duty at some later date to record what the members of this Conference have achieved.

The second phase of medical education which urgently requires the consideration of this World Conference is mentioned only in passing by the University Grants Report—namely, the creation of halls of residence and common-rooms, where students of all faculties, including those of medicine, can come together, for there is no more stultifying tendency among young physicians than to be sufficient unto themselves, and thus to lose contact with the broader humanistic interests that make fully educated men and women. As Sir George Newman contended, this can be realized only in the university atmosphere, and I look upon it as one of the solid achievements of the past ten years that now all medical schools in this country are affiliated with the broadening atmosphere of the university community. This would have been especially gratifying to the late Sir Clifford Allbutt, who wrote in 1906: "It appears that the function of university education is not special instruction in the lines of a profession or trade, however these ends may substantively be promoted, but in expanding and enlarging the mind and making it a more and more perfect instrument of knowledge and progress, whatsoever its destination."

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MEDICINE—A TECHNOLOGY OR A PROFESSION*

BY

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I am gratefully conscious of the signal honour done to me and to my country by the Programme Committee in extending an invitation to me to speak on "Medicine—A Technology or a Profession" at the First World Conference on Medical Education, in its inaugural session. I should like to take this opportunity of conveying to this Conference a message of good will and friendship from the people of Pakistan in general and medical educationists in particular.

The status of medicine as a profession is not only extremely well founded but is a matter of universal acceptance. To those who are not perhaps conversant with modern trends the theme of my talk and the priority accorded to it in such a high-level Conference might appear paradoxical. Keeping in view, however, the changing times, the propensities of the people, the rapid diversification of the profession, and the tendency amongst the politicians and administrators, who have relegated to themselves the responsibility for planning health relief and who are graciously inclined to place us in a class of highly trained technologists and regard

*An address given in the plenary session of the First World Conference on Medical Education on August 24.

our education as purely vocational, no time will be lost in taking stock of the situation and making readjustments, wherever indicated, so as to safeguard the noble heritage of medicine in the precincts as conceived and elaborated by generations of savants and of practitioners of the healing art.

Literally speaking, "profession," according to the Oxford English Dictionary, implies an occupation in which one professes to be skilled and which one adopts as a means of living; it is a specialized knowledge pertaining to an art or a science, being applied to the affairs of others on a basis of recompense. Technically, a body of persons engaged in a particular calling could be said to be occupied in that profession. Thus defined, engineers, teachers, smiths, carpenters, cobblers, etc., could all be designated as professionalists. In practice, however, these vocations are named crafts or technical callings, and not professions. Only three vocations have, however, been granted that status—namely, Divinity, Law, and Medicine. Are there any reasons to restrict the word "profession" to these vocations only? I think there were, and still are, good reasons for doing so, as we shall see hereafter.

Technology may be defined as a systematized or scientific study of the practical or industrial arts, while medicine is a specialized knowledge, and its practice is concerned with the cure, alleviation, and prevention of disease in human beings and with the restoration, preservation, and, lately, with the advancement of health—that is, improvement of future generations of man.

Aspects of the Problem

Naturally the relationship between the practitioners of medicine and the other sections of society is the problem under consideration rather than the intrinsic nature of medicine itself, although the latter cannot be ignored altogether, for the basic nature of the subject has a determinative effect on this relationship.

Science means learning or knowledge. Medicine is not a science in the sense that it is a compendium of factual knowledge about health and disease. The matter is far more comprehensive. It is a systematized knowledge of the human body in health and disease, but it also takes into account the environment and conditions under which man lives. This is only one aspect of the problem; the other is the sociological side of medicine, which is so intricate, so vast and comprehensive, that it actually embraces almost every sphere of human activity.

The vast and imposing structure of modern medicine is perhaps one of the greatest triumphs of the human mind. To comprehend its development, both scientifically and sociologically, the evolutionary history of modern trends should prove useful, inasmuch as it will enable us to appreciate the steady and methodical progress of medicine as an ideology. It must also be appreciated that the evolution of a point of view has always been through a succession of transitions; the ideas of to-day are merely precursors of those of to-morrow. Fundamental ideas undergo a gradual maturation, until we arrive at natural laws. It must be stressed, however, that even these natural laws are not incontrovertible truths. "If a scientific man has not learnt heresy he has learnt nothing," was said by Mian Afzal Husain¹ in his presidential address in the first Science Conference held at Karachi in 1949.

The close and intimate relationship between the advancement of medicine and the advancement of