

BOOK REVIEWS

MEDICAL SCHOOLS AND THE CHANGING TIMES

Nine Case Reports on Experimentation
in Medical Education—1950–1960

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As no other single document has done, this monograph reflects the vibrant mood for critical self-scrutiny and experimentation that has characterized medical education in the United States since the Second World War. This is the definitive account of the effort at mid-century of certain medical schools to adapt themselves to rapidly changing elements in the content of medical science; in the role of research in the life of the faculty; in the numbers and social characteristics of the patients in the wards and clinics of the teaching hospitals; and in the understanding and expectations of citizens with regard to the professions and services that guard their health. For members of the teaching and practising health professions the story is a fascinating one. Here it is told in a manner readily meaningful to the general university reader and to the many responsible citizens who wish to see the resources of society mobilized and expanded in a manner most likely to ensure its overall betterment. Those who

have discerned a seemingly undue preoccupation of medical faculties with the minutiae of their burgeoning task will be reassured. It is clear that substantial and imaginative efforts are being made to ensure "the education of effective, scientific, humane physicians." Many of the concepts and some of the methods described are applicable undoubtedly to other realms of education and to other fields of personal service. All have been subject to the play of more or less similar forces. It may be fair to assume that most of them, like medical education, would benefit from a fresh definition of objectives and a better validation of prevailing curriculum and teaching practices.

It is not by accident that the decade of 1950–1960 should yield Nine Case Reports on Experimentation in Medical Education, a record of considerable significance. Scientific research, already accelerated by the military requirements of wartime, was rapidly expanded by post-war government support. The sheer increase in knowledge and technical skills was staggering to both teacher and student. Increasing specialization in scholarship, already under way for a century, was creating more obvious problems of communication between the sciences. The barriers between academic departments threatened the student with even more duplication and conflict in teaching than before. A growing tendency to de-personalized medical care was apparent to the astute teacher as well as to the public. Medical education was very much hospital-centered, with the focus of attention on the serious or technically complicated disease or method of investigation. Enlarging full-time staffs gave the students better science but less contact with the community and in some cases certainly, less attention to the personal needs of the patient. These features were by no means new but the generation of teachers and physicians moving into leadership during and after the war saw the dangers in new perspective and some were in a position to do something about them.

Wartime experience, on the other hand, had fostered the refinement of certain goals in medical care which had obvious implications for medical education. A better understanding of the dynamics of morale in the troops, the success of military psychiatrists

in dealing with emotional problems and major advances in psychosomatic physiology, all directed attention to the role of behavioral science in the curriculum and added a new dimension to clinical medicine. The success of the rehabilitation movement had a similar effect, emphasizing also the importance of long-range continuity of health care and of team work with the allied professions and auxiliary personnel. Meanwhile, the possible usefulness of the mounting skills of the social scientist, already validated in industry and in certain governmental and military operations, had begun to dawn in the realms of nursing and medicine. A better understanding of the roles of the professions in society and of the way institutions developed and operated had clear relevance for the increasingly complicated world of health sciences and services. These developments threw into still sharper relief the hazards already mentioned and so hastened the search for educational remedies.

This sketch of historical suppositions, for which the reviewer rather than the author should be blamed, may explain the force of the two major movements which Dr. Lee suggests have stimulated the experimentation he chose to recount. One is the concern to cope effectively and selectively with the growing mass of specialized knowledge needed to understand modern scientific medicine. The other is the sense of need to prepare the student better for "his fundamental task in medicine, to deal effectively with patients." Projects from nine universities are cited—Boston, Colorado, Cornell, Florida, Johns Hopkins, North Carolina, Northwestern, Temple and Western Reserve. They are reported in four groups designated by the headings that follow.

Integration of University and Medical Education

Should it really take seven to ten years of university education and postgraduate training to become a family physician, twelve to fifteen to become a clinical specialist? Is the course unnecessarily rigid or standardized? Does it throttle imagination and initiative in the well-endowed student? Does it impair the development of proficiency in one who learns more effectively by travelling at slower pace? Are the educational experiences of college and medical school

truly complementary and is the total educational experience up to the best university standards? In recent years, these questions have been pressed by the public and by the profession; by the medical faculties and by the wider university community.

Many would agree, looking on medical education as a whole, that the implied criticisms are valid; but there would be much less unanimity on what should be done about them. This is due in part to the considerable differences between institutions in respect to their faculties, students, intellectual climate and educational objectives, even though their curricular arrangements may seem on paper to be almost identical. It is for these reasons that a single magic formula of universal applicability is not likely to be found. Each university will have to cope with its special problems according to its own insight and resources and its own educational direction and momentum. Nevertheless, it is interesting to note the considerable parallelism, as well as variety, in the three case reports selected by the author to illustrate efforts to integrate more closely the university and medical school phases of the education of the physician.

The reasons behind the new programs at Johns Hopkins (1959), Northwestern (1961) and Boston (1961) Universities include "the desire to shorten the curriculum, to bring the medical school closer to its parent university, to improve the over-all educational experience for the student, to select students for the study of medicine at an earlier age, and to strengthen the education of future teachers and educators in the basic medical sciences." All three offer the possibility of completion of undergraduate medical studies within six years of graduation from high school. At Hopkins this will be for only the occasional student. The majority of those entering the integrated program (over one-third of the class) will take seven years and the remainder will require the full eight (four years each in the baccalaureate course and the standard medical course). At Northwestern the six-year integrated course is for twenty-five highly talented scholars who qualify from high school for advanced college placement. At Boston University, however, starting with forty, the new six-year course is building up to include virtually the entire class of seventy-two. (With summer vacations practically eliminated

and tuition fees at \$1750, the arrangement may mean drawing from a more restricted group of applicants.) Early selection, advanced placement and acceleration of the course will probably loom large in the eyes of students and thus help medical recruitment. The latter, hitherto, has been at disadvantage when competing with training opportunities for careers in the physical and biological sciences.

More important than these features is the prospect of an improved educational experience for participants in all three ventures each with its own emphasis on how to provide enrichment. At Hopkins, after two years of college, including at least one year of general chemistry and one year of general biology or zoology, the student embarks on a year devoted primarily to chemistry, physics, bi-mathematics, English, history and philosophy. Except for one weekly seminar all the afternoons are free for study or independent work. The student is thus introduced earlier to the Hopkins traditional use of electives and free time for research projects. One can expect now to encounter preclinical students, as well as their clinical brethren, in the laboratories of Columbia, Harvard, Oxford or London, as they pursue their scientific hobbies during their annual 12-week elective quarter.

The new program at Northwestern stemmed from a careful analysis of the sequences required to grasp the concepts of modern physics, chemistry, biology and social science. Professors interested in finding better approaches for gifted students devised entirely new courses for them. This is part of a major revolution taking place in the teaching of the sciences and their related mathematics. In behavioral science a similar combined approach to psychology, anthropology and sociology is used. Seminars in the humanities are planned for the two clinical years when there is also an annual 12-week quarter free for special clerkships, research or graduate study in a field of choice. All this and a saving of one or two years! This experiment lends itself to easy evaluation because the other 100 students in the standard course will serve as controls.

At Boston University the combined liberal arts-medical program also saves two years and aims to "provide an improved intellectual climate and allow a faster pace of learning." Looking at the sec-

ondary school system and various college courses they noted much duplication, incoordination and failure to provide stimulus. Could medicine become a part of general education? The two-year liberal arts phase has the goal of "providing an understanding of human nature and an awareness of the range of human values, developing an orderly scholarly mind, understanding social problems as they relate to the responsibilities of the physician, and appreciating principles of ethical conduct." The major teaching instruments are the seminar and tutorial. Again, the science teaching has been reorganized and mathematics is taught as part of physics and chemistry.

All three programs are obviously significant not only for the education of the physician but also in higher education generally. They all place a premium on the capacity of the good student to respond with independent initiative to a logical, uncluttered curriculum with freedom to explore in depth the topics that intrigue him. They all strive for a balance between the scientific and humanistic studies. They have all broken the lock-step of a medical course of rigid length, recognizing the variable capacity of the student and looking on the curriculum as an instrument to be shaped to serve the learner, not to beat him down. Critical questions posed by Dr. Lee can be answered only with the lapse of time. How disruptive will these attractive courses be to the arts-science college? Will they deny to the best students the possibility of a full liberal arts course with its buildup of interest and of responsibility as the climax in the senior year is attained? (The infrequency of this intellectual satisfaction may be an important factor in stimulating the search for a better approach.) How successful are clinical tutors likely to be in maintaining the broad interests aimed at in the total curriculum? Will the medical and liberal arts divisions be able to sustain the fine rapport achieved in the planning stages of the program?

One might also ask how many universities could afford to muster such precious resources of scholarship and teaching time to provide a superlative experience for one professional student group. The reviewer would suggest that if these ideas and approaches are validated, then the sooner they permeate the whole institution the better it will be for education and for the society which it serves.

Reorganization of the Medical Curriculum

Great ventures are born when leaders with vision, amid a climate of change are given the opportunity to translate ideas into effective action. This was the cluster of circumstances at Western Reserve University in 1945 when Dr. Joseph T. Wearn became dean of medicine. Within five years, death and retirement permitted the selection of new heads for ten of the thirteen departments, all committed to a fresh exploration of their task as teachers. What transpired, in a general way, is well known. Cleveland soon became a Mecca for the pilgrims and globetrotters of the medical education world. No one departed untouched. Many were fascinated by the interdisciplinary subject matter committees and integrated teaching, by the family clinic and free time for students and particularly by the multidiscipline laboratories. Some were distressed by the picture of innumerable committee meetings, or even affronted by finding many of the traditional surface markings of a medical school obliterated, e.g., the large block of anatomy in first year and full class laboratory exercises in biochemistry and physiology. Practically all, one would guess, were touched by the open minded, enthusiastic sincerity of the majority of the faculty. The influence of what could be seen at Western Reserve from 1950-51 onwards is apparent in every medical school built since that time and in many of the old ones. What is more important is to identify the significant, or even unique kernel of this development; to express it, if possible, in terms of principle and universality. This has been done well in the Lee account; but first some more background.

The dean and his associate, John L. Caughey Jr., and later the chairman of the new Committee on Medical Education, T. Hale Ham, helped the faculty to focus on the issues before them and to work out a logical plan of action. They noted the spoonfeeding methods of teaching, the growing gaps among the scientific disciplines, the lack of collaboration between departments, the rigid curriculum that took no account of variations in student interest or aptitude and the devastating effect upon students of fixation on examinations, on grades and on learning by memorization. Also missing was a deliberate, systematic and continuous effort to mold

the student as a person for his later professional role. In the eyes of this faculty, medical education needed a dominant, guiding principle to weld its parts together.

As the author describes it, the objectives finally adopted were simple: "To teach medicine as a coherent, meaningful whole rather than a series of unrelated disciplines and to give the student from the beginning of his medical education a feeling for the central purpose in medicine, to deal helpfully with patients." These goals were to be attained by selecting the content of teaching for its importance and by arranging it in sequence; by rejecting any attempt to cover all fields of medical knowledge in favour of "learning to distinguish fact from theory through familiarity with the scientific method"; by fostering "an understanding of the patient as a person and as a member of society"; and finally, by treating the student himself as "a maturing individual who could take increasing responsibility for his own education." These were the features of the *credo* on which the curriculum at Western Reserve was reconstructed.

A description of the curricular methods used would be out of place here but a brief reference may explain their refreshing impact. Teaching was integrated around general topics by a committee drawn from departments concerned; e.g., from Biochemistry, Microbiology, Pathology and Radiology to teach the mechanisms of cellular and tissue injury and repair. For a month at the end of first and second years (originally one day a week) the student worked at a research project to whet his curiosity and to learn the application of scientific method to the solution of a real problem. In fact, most of his laboratory training was research in miniature. In the final year, a "bioclinical" half day each week brought basic science and clinical scholars together to discuss live issues; and for graduation a project thesis was completed. About 10 per cent of the curriculum was devoted each year to learning science and scientific method and a similar proportion went toward learning to think as a physician.

Human problems, as an official concern, were introduced as early as enzymes. Each first year student followed the family of an expectant mother through delivery and on into the walking and talking stages of the new child's development. Guided for two years by

the same preceptor, the student learned to relate his studies to his own conception of the target and to the objectives of the course. In subsequent clerkships on the wards and in the group and continuity clinics the student took responsibility for the provision of exemplary comprehensive care for both hospital and ambulatory patients. Free time was allotted officially for projects, extra clinical work, study or recreation according to the interest of the student. This illustrated the faculty's determination to treat the student as a maturing person, giving him an opportunity to make decisions and to assume responsibility for continuing self-education. Examinations were made an educational instrument by holding them only at the end of major subject blocks and by returning corrected papers. Class ranking and numerical grades were abolished; only honors, pass or fail grades were given. Finally, research on the process of education itself was made an official activity of the faculty.

What has been the significance of the Western Reserve development? One can say categorically that faculty and students regard it with enthusiasm and as highly successful. This verdict is sustained in numerous descriptive reports and evaluative studies.¹ Its influence has been apparent in virtually every new development in medical education in the United States and in some abroad. Yet the objectives, as statements, were not new and many of the curricular devices had appeared or were developing independently elsewhere. That they were not always as successful when copied in other settings has been clear; and this brings us to the heart of the matter. Visitors and commentators too often have perceived only the devices of curriculum, missing the underlying philosophy and the historical stages through which the faculty moved in developing its instrument—the curriculum. For putting the record straight on this point we are greatly indebted to Dr. Lee.

"The essence of Western Reserve is that they have actually put into practice some of the reforms which other medical educators have been talking about for the past 50 years." This did not result from a stroke of the pen. The good fortune of being able at a crucial time to recruit new heads in most departments has been mentioned. A model of democratic faculty organization was created and all

moves were made only after thorough study in representative committees; then examination of their well documented findings by the General Faculty. Under these circumstances, and with a strong sense of need to correct deficiencies, it is understandable that "the faculty not only drew up a statement of objectives but actually used it as a living guide to policy and procedure; it still serves that purpose." Thus the curriculum, being under continuous scrutiny for relevance to an educational philosophy, to which all adhere, is frequently altered in the light of further experience. "They are attempting to solve their own problems as they see them, and are not trying to create a blueprint for medical education to be followed unthinkingly by others." Other schools will benefit of course by examining their solutions but still more by understanding their general approach; particularly if in full sincerity they can emulate their attitude toward the content of medical education and toward the medical student. "The faculty members of Western Reserve have reminded the rest of us in a tangible way that the medical student is the focal point of medical education."

The Flexner Report of 1910, often called the watershed of the 20th century for American medical education, marked the climax of a movement to establish medicine again as a university discipline. It consolidated the wisdom of decades in a plan for action which was implemented. The same movement has acquired new dimensions, and broad conceptions have once again been crystallized in decisive, definitive action by more than a dozen medical faculties. One of them has epitomized particularly well the current trend with its four corner stones of conviction: that medical education must cleave to the best university postulates in the methodology of science and in humanistic values; that along with its obligations to advance knowledge its central task is the preparation of competent physicians with understanding of the community they will serve and their role in it; that this is best done by responsible participation in a teaching arrangement for patient-centered medical care, as an integral part of a student-centered curriculum; the whole to be subject to constant systematic scrutiny and easy revision.

At Western Reserve University these vital concepts have been

translated into effective action in a particularly deliberate and consistent manner and at a crucial point in history. This reviewer would regard the Cleveland *vignette* symbolically as a second, perhaps equally momentous watershed for medical education in this century. If such a nomination calls for a critical date one may suggest 1950, the year the Committee on Medical Education was organized and began its work with the departments to establish the new educational objectives of the school and the means for their implementation.

Teaching Comprehensive Medicine

The scientific basis of medicine is in an exciting state of revolutionary advance. New understanding of the mechanisms of life has already altered radically the techniques of clinical medicine. As research continues, we may expect ever increasing benefits; but also, further complexity, a still greater division of labor and the need of new skills and administrative structure to transmute the benefits of scientific discovery into new patterns of health care for the entire population. How to render this on a long-range personalized basis, with adequate attention to the psychological, social and preventive aspects is a major question facing the health professions and government. Only recently has it received status as an academic field in medical schools, an advent which, Dr. Lee notes, has evoked criticism. The issue is important enough for brief comment.

Several distinguished medical scientists have feared a weakening of the solid scientific core of education when the student is exposed to various types of preceptorship, home visiting scheme, family follow-up or comprehensive medical care clinic. One view is that precious time spent in this way might better be devoted to more substantial studies. Another charge is that these programs have nebulous objectives and do not rest upon a solid base of validated subject matter; or are frankly anti-intellectual or unscientific. Some believe that the whole trend of interest in psycho-social matters has reached unhealthy proportions.

The author agrees that some of these efforts have been poorly designed or even misdirected in their intention. (What branch of teaching has been free from the "bandwagon"!) When the objec-

tives of a venture are valid then it should be judged by the extent to which they have been achieved. He protests the equating of a compassionate feeling for the welfare of a patient with an understanding of the emotional and social factors involved in illness. "Failure to understand and recognize these influences is unscientific in the first place and it can be detrimental to the well-being of a patient in spite of the most sympathetic and humanitarian feelings on the part of the physician." The case reports he selected for this section deal with efforts to investigate more precisely the role of these factors in good patient care. In each instance a special setting was created to improve the experience of the student in the care of patients in a personalized, comprehensive way.

"Comprehensive medicine simply implies the mobilization of all appropriate available resources for the care of the patient." Its special attributes include an interest in the patient as a person (as distinct from his diseases), which implies an appreciation of his life problems and of his setting; an emphasis on promotion of health; continuity of care and its ready availability; and making full and prompt use of special services, e.g., social service or rehabilitation. In the opinion of the majority it cannot be demonstrated in the hospital ward or in the usual outpatient clinic. This volume describes in a fascinating way what four medical schools did about it—Cornell, Colorado, Temple and North Carolina. It reveals the features common to all and those distinctive of each. The latter stemmed in an authentic way from differences in setting, in prevailing problems and opportunities and in the orientation of local faculty leaders.

All four used a controlled practice setting in which the skills of more than one kind of professional were used, e.g., internist and psychiatrist, with social worker and public health nurse. Each carried out original research on patient care and/or the response of the students to the program. An elaborate evaluation was conducted in one case by a team from another university. Dr. Lee's bibliography cites over 40 published reports from these centers, representing meticulous research design and observation. Intimate contact by future practitioners of medicine with studies concerning the im-

provement of patient care must be a valuable stimulus to competent performance and to an attitude of critical enquiry.

It is not possible here to describe the programs individually. Each faculty has been a pioneer in its own field of emphasis: at Cornell, in exploring the sociology of medical education, in establishing research on the care of patients as an academic discipline and in giving promise that by "objective analysis some aspects of the art of medicine can be made scientific"; at Colorado, to make a controlled study of an educational experiment using refined techniques to measure the responses of students; at Temple, in a truly patient-centered clinic to study the nature of the doctor-patient relationship and to give students a practical experience in dealing with the total person irrespective of the type of illness; and at North Carolina, where an interdepartmental ambulatory clinic is the focus of the medical school in its service to the state there is a splendid example of faculty co-operation and of operational research on the daily tasks of teaching students and treating people. At each of these universities, experience with the teaching-research unit in comprehensive medicine has prompted secondary improvements in other parts of the curriculum and in other fields of patient care. As one might say for the monograph as a whole, this chapter's account of classical ventures in a new realm should be required reading for all who teach or work in hospital outpatient departments or who carry responsibility in group practice.

Founding A New School

Innumerable deans and members of medical school planning committees have derived inspiration and practical help from a pilgrimage to the J. Hillis Miller Health Center of the University of Florida since it opened in 1956. The Gainesville development symbolizes the new concept of the university health sciences center; training the whole health team, serving its constituency in a planned manner and experimenting with new devices in the hospital and in the three colleges of Medicine, Nursing and Health Related Sciences.

In so many respects Florida has done things the right way. A

report by a citizens' committee to the legislature was followed in due course by a survey of the health service and manpower needs of the state in which members of the university faculty were deeply involved. Leaders of the medical profession, well informed and brought into early consultation, give the new school their support. Clear educational objectives were derived from a lucid concept of the mission of this university medical center. Here the architectural pattern has expressed deliberately the philosophy of the planners—in the private study cubicles for students, the patient-education suite, the ambulatory patient wing where patients and escorts from out of town may stay, and the general spatial relations within the center and with the campus and traffic flow.

Dean George T. Harrell and his faculty, all of whose department heads were under 40 at appointment, aim to produce family physicians to "understand human behavior and the problems of patients, to be able to deal with other members of the medical care team, to think logically, and to apply the scientific method to medical problems." The author suggests that if this can be attained in four years of medical school, then the Florida program will have been uniquely successful.

Conclusion

Reviewing the ferment of experimentation in medical education in the period 1950–1960, this monograph has justified the caption over Chapter One—The Climate of Change. The nine medical colleges described have sought in the main to find better ways of dealing with the enlarging and increasingly complicated subject matter of the medical sciences, and of preparing physicians who can work well with their patients and understand the society in which all will live. The author points up three important issues that must receive attention now.

Not much is known about quality of medical care and how to rate professional competence. Still less is known of the relation between the conventional academic measurements and subsequent performance. In fact, evidence is accumulating to suggest that much of what we measure may be irrelevant to the ultimate goals. Re-

lated to this, and of central importance, Lee suggests, is the matter of medical student selection. What are the criteria for identifying good practitioners, good teachers and good scientists for the future? Finally, granted that the goal of good teaching is good learning, how may we assess the methods we use? Many of them are inherited from past generations. Studies in this realm are advancing rapidly. One might add a fourth question, related to the shrinking globe and the evident indivisibility of health problems among the nations. How may we best use our supply of key health personnel so that service may be rendered more widely? Are there more economical yet satisfactory methods of rendering health care than we know now? These are all vital topics for research and the prospect for making headway is good. At the end of the 1960's, on the basis of the present report, another review by Peter V. Lee would be welcomed.

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REFERENCE

¹ The most important account appeared after publication of Dr. Lee's monograph: Ham, T. H., Medical Education at Western Reserve University. A Progress Report for the Sixteen Years, 1946-1962. *The New England Journal of Medicine*, (October 25 and November 1, 1962), 267: 868-874, 916-923.