

PROCEEDINGS OF THE FIFTIETH ANNUAL MEETING OF THE  
AMERICAN SOCIETY FOR CLINICAL INVESTIGATION  
HELD IN ATLANTIC CITY, N. J., MAY 5, 1958

PRESIDENTIAL ADDRESS

CLINICAL INVESTIGATION AND  
MEDICAL EDUCATION

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I have chosen as the subject of my address the contribution of clinical investigation to medical education. During the past few years there has been an extensive re-evaluation of the method and content of medical teaching. The discussion that has ensued cannot but be helpful in defining the goals of our medical schools.

It would seem presumptuous of me to emphasize the importance of the relationship of investigation to teaching if this aspect had not been relatively neglected in recent writings on medical education. Whitehead (1) has stated, "The justification for a University is that it preserves the connection between knowledge and the zest of life, by uniting the young and old in the imaginative consideration of learning. . . . This atmosphere of excitement, arising from imaginative consideration transforms knowledge. A fact is no longer a bare fact: It is invested with all its possibilities. It is no longer a burden on the memory: It is energising as the poet of our dreams, and as the architect of our purposes." The clinical investigator can bring to the student an imaginative consideration of learning. This can transform the discussion of clinical problems on the ward or in the conference room from the dull repetition of clinical syndromes or exposition of traditional therapy to the excitement which can be evoked by exploring the frontiers of knowledge. My own life was profoundly influenced by two great teachers, Soma Weiss and William Castle. They brought the freshness and enthusiasm of the investigator to each clinical problem. The student was not only stimulated to acquire the known information on a subject but was also compelled to explore the unknown.

The present day criticism of medical education does not lie in the failure of the teachers to transmit information in an imaginative and enthusiastic manner. Rather it pertains to the neglect of certain areas of human knowledge which are relevant to the care of patients and to a failure to teach the student to understand the patient as a human being. There is considerable truth in the first indictment. One of the major failings of modern science is the division of knowledge into compartments. Most of us have difficulty in mastering the techniques and new contributions in our own narrow field. For this reason it is easy to overlook major advances in other areas of knowledge. Certainly the increasing knowledge of man in relationship to society should contribute greatly to medicine. We should welcome the contribution of the

social scientist, the anthropologist or the psychologist to the solution of the problems of the sick human being.

Admitting the need for a greater understanding of man and his relationship to society, is there any need to abandon the scientific method or alter our critical standards? I believe not. We must guard against the confusion of hypothesis with fact and poor logic in this area as in any other. As Romano (2) has put it in discussing the teaching of psychiatry, we need more, not less, science in medicine.

If we accept a broad definition of science there need be no other aspect of the teaching of medicine than the scientific. Morris Cohen (3) has said, "Scientific method is thus the persistent application of logic as the common feature of all reasoned knowledge. From this point of view scientific method is simply the way in which we test impressions, opinions or surmises by examining the best available evidence for and against them." If this be true then every physician should have proper training in the use of the scientific method. Certainly the heart of the practice of medicine is the critical evaluation of evidence and the ability to select a logical course of action based on this evaluation.

Experience in scientific research would appear to be the best method of inculcating the use of the scientific method into teacher and student. It is particularly important for the teacher of medicine. It is only too easy in clinical teaching to substitute authority for knowledge and prejudice for sound reasoning. This does not imply that the teacher need be a leader in one of the fields of research or even be continuously active in research.

An important development is the increasing opportunity for the undergraduate to participate in research. This is being done by creating more free time in the academic year and by providing fellowships for summer work. Probably nothing is more valuable to the student than the opportunity to participate in scientific investigation. Only in this way can he be made to understand the difficulty in evaluating evidence obtained from experimentation. The rapid growth of scientific knowledge in medicine and the accelerated introduction of new therapeutic agents by the pharmaceutical companies strains the critical faculties of every physician. Nothing is more important to the medical student than to acquire the ability to accurately evaluate evidence. In the past the rigid curriculum together with the necessity of memorizing

large amounts of information tended to stifle the imagination of the student. Thus his most precious asset was lost.

One of the encouraging aspects of recent changes in medical education has been the breakdown of departmental barriers. The science of medicine must have a wholeness which is more than the sum of the individual disciplines which are represented by the various departments in a medical school. The necessity for a high degree of specialization in research is apparent. The acquisition of difficult techniques and a thorough knowledge of the mass of information which has been accumulated in a narrow area is essential for the investigator. In teaching, a broad approach is important. The medical student must learn to understand man in health and disease.

Perhaps what I have said seems familiar and of no pertinence to the present problems of medical education. Certainly all of these views were expressed by Flexner (4). Yet in some of the recent discussions of medical education there are implications that the intuitive approach to medical problems has value in teaching. As Atchley (5) has pointed out, there have also been implications that training in and adherence to the scientific method in some manner diminishes the power of compassionate feeling towards suffering human beings.

It is my feeling that the teaching of medicine must rest on the scientific method. The scope of inquiry and interest cannot be confined to the purely biologic or physical aspect of the problems presented by the sick human being but must include the psychological and social areas. In broadening the area of inquiry we should not lose our critical sense. In medicine there is always the temptation to accept new ideas with enthusiasm and without careful examination. This must be guarded

against in the evaluation of contributions of the social sciences to medicine. Equally dangerous, however, is the closed mind which limits the boundaries of science to the purely physical and chemical aspects of nature. One of the great challenges to medicine in our time is a better understanding of man's relationship to man. Every encouragement should be given to the scientific workers in this difficult field.

The ferment in medical education is a sign of the vitality of American medicine. The numerous experiments in teaching should provide information of great value. Out of this may grow a diversity in the approach to medical education which has been lacking in the past. I would certainly hope that no attempt will be made to impose a uniform philosophy of medical education. Such a philosophy would eventually stultify the thinking of the teachers and create an atmosphere of conformity. Instead, an atmosphere of freedom and experimentation should exist in medical education as in scientific research.

#### REFERENCES

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