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PRESIDENTIAL ADDRESS

CLINICAL RESEARCH AS A CAREER

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On May 10, 1909, Dr. S. J. Meltzer, the first President of this Society, addressed the members on the subject, "The Science of Clinical Medicine: What it Ought to be and the Men to Uphold it." In his introductory remarks he said, "The honor of the presidency of a society goes with the privilege of discussing some of the aims of that society." In discharging my responsibility as President, forty years after Dr. Meltzer, I am tempted to review the accomplishments of this Society, but such would be idle boasting. I would like to call your attention to the history of this Society by Dr. J. Harold Austin of Philadelphia which appears in the March, 1949 issue of the *Journal of Clinical Investigation*. It is well worth reading. Dr. Meltzer was deeply interested in the capable young individual who elected a career of clinical research. Since today, more than ever, young individuals are continuing to manifest an interest in clinical investigation, I would like to discuss with you some of the problems relating to their training.

The Clinical Investigator as a Clinician

Clinical investigation implies the critical study of human beings in sickness and in health. This suggests many ramifications of effort. While fruitful studies on human disease may be pursued within the confines of laboratory walls without the investigator ever coming in contact with patients, someone has had to define the problem or problems in disease that the patients present. It cannot be emphasized too strongly in this day of highly specialized techniques and laboratory research that successful clinical investigation is dependent upon a knowledge of disease in human beings. If one is setting out to resolve a problem in human disease, it is desirable to know as much as possible about the natural history of that disease. This information is not to be gleaned in an armchair, pouring over books and journals, but rather by the persistent observation of patients on the wards and in the dispensaries. The individual interested in a career of investigation should pursue further clinical training after completing his internship by selecting an appointment in which he will be given responsibility for the care of patients and in an institution where he will have the time and facilities to engage in research. Competent advisors should be readily available to aid him in his clinical activities and to lend direction to his investigations.

What attitude should the resident in clinical medicine interested in a career of research and academic medicine take toward certification by one of the specialty boards

of medicine? This is not the place to discuss the trend toward specialization in medicine as reflected by the specialty boards. But I see no valid reason why the resident should not fulfill the requirements of certification while he is obtaining his training. If he expects some day to have an academic appointment of any merit, in which he will be responsible for the clinical training of undergraduate and graduate medical students, he should at least possess that general knowledge of medicine which is necessary to pass the examinations of a specialty board. Furthermore, after he has had his formal residency training and has had an opportunity to engage in research activities, he may desire to go into the practice of medicine, or, much against his wishes, economic circumstances and obligations may make it mandatory that he enter into care of his own patients. Engaged in the private practice of medicine as a highly trained clinician, certification by a specialty board will be a decided advantage. However, it is difficult to lend a sympathetic ear to the individual whose primary interest in a residency is to fulfill the requirements of a specialty board and who applies for an appointment on a service devoted to teaching and clinical investigation with this purpose in mind.

The Clinical Investigator and the Basic Sciences

Clinical investigation today, contending as it does with the complexities of human disease and the assimilation of quantitative information, has narrowed the possibilities of carrying out fundamental research at the bedside of the patient. Highly technical knowledge is essential and the special tools of a basic discipline are frequently needed. The clinician may obtain help with his problem by turning to his colleagues in the basic sciences or to skilled laboratory technologists. Under these circumstances, he throws himself on the mercy of others for the accuracy of the acquired data and for their interpretation. It is difficult to evaluate laboratory results if one is unacquainted with the basic principles involved, and one cannot seek out the sources of error if he is ignorant of laboratory methods. Therefore, in the prosecution of clinical research, it is frequently necessary for the clinician to take time out and go into the laboratory. A year or two may be devoted to one of the basic sciences such as physiology, bacteriology, or pharmacology. Today it is not unusual for clinicians to concentrate on a review of the advances in the fields of chemistry or physics. A brilliant chapter in the history of clinical investigation includes modern cardiovascular surgery

achieved by the amalgamation of basic physiologic principles and improved surgical techniques worked out in the laboratory on lower animals. The surgical correction of coarctation of the aorta was not evolved by the method of trial and error on human subjects, but the techniques emanated from the laboratory after months of painstaking thought and effort.

The Clinical Investigator and the Research Team

One of the developments in recent years in clinical research has been the organization of personnel as a team in the prosecution of a problem. This tendency toward joint effort was accelerated during the last war. For many projects there are distinct advantages that accrue from pooling the abilities of several investigators. Among the disadvantages lurking in such an endeavor is the shackling of the independence of thought and initiative of young investigators. Any individual who wants to do original work in clinical research must be extremely discriminating in electing to participate in a large project lest his freedom of thought and action be smothered by the desires of his supervisors. This trend toward team research applies not only to the medical sciences but also to other fields.

The Clinical Investigator and the Preparation of Data for Publication

It is unfortunate that many investigators in the course of their training have not been given direction in communicating their results to others. While this applies also to the verbal presentation of data, I am particularly concerned with the preparation of manuscripts for publication. Such an endeavor often represents several years of work by the individual, and an institution may have expended thousands of dollars in giving that person an opportunity to carry out the research. And yet it is pathetic to see the results embodied in an inarticulate exposition. That young investigators are not being given guidance is manifested by the appeal made by the editors of the *Journal of Clinical Investigation* in the issue for September, 1948, when they cited the deficiencies of papers being submitted to them and asked that more diligence and care be given to the preparation of a manuscript. Some principal investigators are so engrossed with their own research and personal interests that they have neither the time nor the concern for aiding the young investigator in the assimilation of his data and preparing them for publication. The writing of a scientific paper is not easy, and there are no short cuts in preparing an accurate and readable report.

The Clinical Investigator and His Economic Status

Individuals who elect to spend three or more years as a resident in one of the clinical disciplines face the grim reality that the financial return at best is but sufficient to meet the basic needs of existence. It is to be regretted that this applies to those who are encouraged to extend this postgraduate period of training and continue on with clinical investigation. Considerable admiration

must be extended to the courage of the war veteran with a wife and children who has made the decision to stay with clinical research. Too often, able individuals find it utterly impossible to continue on with the stipends accorded them, and they drop out and go into more lucrative fields of medical endeavor, especially private practice. It has become quite obvious that medical schools, hospitals, and institutes of research cannot satisfactorily finance the medical program of graduate training in medicine. It is also apparent that private enterprise in general cannot continue to support medical research as in the past. Where, then, are the institutions charged with the responsibility of training clinical investigators to turn for financial aid? Major support today is coming from the Federal Government. The taxpayer is footing large expenditures of funds for medical education and research. Because of this postwar development, I would like to discuss briefly Federal aid that is coming from three sources. First, a most remarkable union has been made between medical education and the Veterans Administration. This joint enterprise has resulted in an excellent training program for residents in the various specialties, and it has encouraged sound clinical investigation. The end result has not only been of considerable aid to the medical schools in discharging their obligations for postgraduate medical training to the veterans, but the patients have benefited from the skilled medical care. If a large segment of clinical material is to be hospitalized under the Veterans Administration in the future as at the present time, it is absolutely essential that medical schools continue with this cooperative effort. But the union will only continue successfully if the same high standards set up by the Deans' Committees and the Veterans Administration continue in force. A second type of Federal aid to medical education and research is that manifested by the United States Public Health Service. These funds have been administered wisely and have supported many excellent research projects. In addition, the Public Health Service has fostered a modest but sound program of education and research for promising young individuals. A third type of Federal aid to education and research is that distributed by the military branches. It seems almost incredible that in a free society desperately seeking ways to achieve world peace, tremendous sums of money should be allocated to military agencies for applied and fundamental research, particularly when much of the research has no direct bearing on military activities. While freedom of thought and action in research has accompanied the Army and Navy grants for medical investigations, it should never be forgotten that anything earmarked military implies security and that, under these circumstances, freedom may be stifled overnight in the interests of "national security."

Some young investigators are sorely grieved, and perhaps rightly so, at the scanty financial returns afforded them during their formative years. If these individuals anticipate later on in life an income commensurate with their labor and contributions to medical research, they will be sadly disappointed. As the young investigator matures, and after he has established his ability as a

clinician and as a scientist, he is often faced with the serious decision as to whether he can continue in the field of medical research on a full-time basis. Too many times, economic circumstances demand that he compromise and attempt the blending of the private practice of medicine with clinical research. It is not my purpose to belabor the question of private practice versus the full-time clinical investigator, but this problem confronts most men who are attempting to develop and direct medical research. As he concluded his address to the first meeting of this Society, Dr. Meltzer stated, "Teaching medicine and furthering its science is a very serious business which ought to be carried on by men who are ready to devote all or most of their time to it—but let me tell you: beware of practice. It is a bewitching graveyard in which many a brain has been buried alive with no other compensation than a gilded tombstone." Twenty years later, another great figure in clinical research, Sir Thomas Lewis, wrote, "No investigator can be successful who allows, or is forced by circumstances to allow, solicitude for his patients to preoccupy his mind." While it would be highly desirable today for competent young men to continue on a full-time basis, we cannot escape the bald fact that hospitals and medical schools are able to support in this manner but a very limited number of these individuals. I am of the opinion that a man can carry on a restricted private practice and engage in clinical research. Under these conditions, a clinician is often a better teacher and, if clinical investigation means the study of human disease, patients coming to him for advice may be of considerable aid in the resolving of a clinical problem. But unfortunately, the well-trained clinician possessed of desirable personal characteristics is often sought after by other physicians and patients to the detriment of his research. A soaring income accompanied by an elevated social position frequently has more enchantment than the self-sacrifice and many frustrations that go with clinical research.

The Clinical Investigator and His Obligation to Society

The era in which we are living has been called the Scientific Age, and now we are told about the coming Atomic Age. Society with its "cold wars" and anxious tensions expects and needs leadership from scientists. While the attention of the public is centered chiefly on

those working in the fields of nuclear physics and electronics, the medical scientist has also grown in stature. Is the medical man prepared to assume his responsibility of leadership? One of the undesirable aspects of medical education is the emphasis placed upon the natural sciences and the scant attention given to the study of history, political economy, and the social sciences. When the student of medicine in this country finishes his undergraduate and postgraduate education, he has received the finest technologic training available in the world today. But he has not been educated for a position of leadership in society at large. He does not know, nor often does he appear to care, about the social, political, and economic changes disturbing the equilibrium of society. In his zeal to unravel a mystery of pathologic physiology at the bedside or in the laboratory, he has no time for the problems of the world with its clashing ideologies, opposing cultures, social hatreds, and nationalistic pride masking economic greed. The medical school curriculum could stand a little more emphasis upon social pathology, even at the expense of morbid anatomy. The young clinical investigator is the leader of medical education tomorrow. In concluding my remarks this morning, I would like to plead that the young medical scientists do not hide within their ivory towers of learning, oblivious of the community and its problems. As the investigator pursues his training, let him give time and thought to the immediate issues facing mankind. As he attempts to mold and influence the thinking and attitudes of medical students under him, let him remind his charges that the possessor of a medical degree is a humanitarian rather than merely a doctor dispensing his technologic skill to the highest bidder. Let him instill within his students the desire to acquire a social conscience. Let the young instructor inculcate upon his classes the fact that environmental factors are often more important in the genesis of human illness than organic changes. Finally, he knows and his students know that the distribution of medical care will undergo some changes. Let him beseech his students as they attempt to resolve this problem in their own minds that they utilize the experimental method in which conclusions are reached only after accurate data have been assimilated rather than on the basis of ignorance and selfishness.