The Professional Status of Clinical Chemists

The human body is certainly one of the most compound machines in nature. Medicine is one of the noblest and most difficult of arts, made up of a number of sciences different from each other. The practice of physic requires deliberation, reasoning, judgment and experience. Surgery calls for different powers and qualifications rarely united in one man. Are these all to be blended with the apothecary, the botanist, the chymist, which ought to be, and are, each of them separate and distinct in their very nature. Whilst we labor among such a variety of pursuits, all improvement must be at a stand. Whereas, let each cultivate his respective branch apart, the physician, the surgeon, apothecary, (the chymist), and so forth, the practice of medicine will then be daily improved and it may be practiced with greater accuracy and skill as well as less expense.

The above quotation is taken from "A Discourse upon the Institution of Medical Schools in America" by Dr. John Morgan in 1768, is proof that the problem of interdisciplinary relationships is not new. Yet I know of no more lucid statement of it, and the conclusion "let each cultivate his separate branch apart" testifies to the wisdom and insight of a great man, one of the founders of medicine in America.

Medicine, the art and science of healing or alleviating disease, is the province of the physician. In this area no chemist may intrude except in association with a physician. It is the physician who must recognize the occurrence of illness and identify the disease from which a patient suffers. The physician may use laboratory examinations for this purpose in conjunction with the result of his clinical findings. Later, he may use additional laboratory examinations to follow the course of the illness and response to treatment. It is the physician who must decide which of many hundreds of laboratory procedures are applicable. It is his responsibility to obtain appropriate specimens and to

From the William Pepper Laboratory of Clinical Medicine, University of Pennsylvania, Philadelphia.

select the person or persons whom he considers qualified to examine the material he has collected.

Surely the clinical chemist must constantly have in mind his dependence upon the physician. It is the physician who initiates and orients chemical studies of his patient. In effect, the clinical chemist by using his chemical skills undertakes to provide accurate factual information to the physician. This the physician must integrate with his own clinical findings and impressions. No clinical chemist should propose to a patient directly that certain chemical studies be made, nor should he report his findings or attempt to interpret them to a patient, unless he is also a physician.

On the other hand, the physician must be free to obtain factual information from whatever source he believes most dependable. He may decide to make his own chemical examinations, and it is well for us to remember that some of the most able chemists among us are physicians. He may wish to refer the studies to be made of his patient to a clinical pathologist. He may request the services of a clinical chemist, especially if the examination required is chemically complex. There are some medical colleagues who would abridge the free choice that the physician now exercises and compel him by law to utilize only the services of laboratories directed by physicians. The effect might be to curtail the availability to the physician and his patient of the skills and knowledge of many expert scientists, the chemist, microbiologist, immunologist, physicist, and others. It is they who by single-minded concentration on one branch of science are often better equipped to serve the physician than those whose knowledge covers many subjects, but is thereby diffused.

However, if the physician encounters a chemical problem and seeks the services of a clinical chemist, what assurance has he that the chemist is competent? He may utilize the roster of the American Board of Clinical Chemistry (if he has access to it), but if the chemist is one of the many not listed, is he competent or incompetent? Did he fail to qualify for the Board? Did he actually earn the B.S., M.S., or Ph.D. degree that he appends to the name on his business card? Except by extensive investigation or by trial and error that may prove costly, the physician has no means of assessing the merit of the chemist. In every field related to health, except the laboratory sciences, persons intending to practice in that field must prove their competence to a governmental agency. Were they aware of it, the charlatans and impostors, the holders of self-awarded and other meretricious degrees, would find abundant opportunity to carry out their frauds and misrepresentations in this field at the public's expense.

**LICENSING IMPERATIVE**

I have yet to hear a single convincing argument against licensing of scientists and other personnel working in clinical laboratories. Certification or registration are not the answer because they are not compulsory. The incom-
petent, those who create spurious results when in difficulties, those persons in any way unfit for the important responsibilities of laboratory work, successfully avoid any review of their qualifications because of the voluntary basis of existing programs. Only by making a review of each person's qualifications obligatory can the public be protected against incompetence. We, clinical chemists and scientists, who are acquainted with the hazards of the anarchy that now exists, who know of instances in which poorly qualified laboratory workers have caused life-long illness or death, will be shirking our duty and responsibility if we do not strive to overcome the hazards posed by the incompetent laboratory worker. These tragic accidents occur in physician-directed laboratories also. I hope that the Association will take a strong stand in favor of legislation for the licensing of scientists and other personnel working in clinical laboratories. The rendering of an incorrect laboratory report can be just as dangerous as the dispensing of a wrong medication. Yet pharmacists have been obliged to become licensed for years, and properly so. Or, if licensure is as ineffective and futile as its opponents claim, why not abolish licensure of pharmacists, nurses, physicians, dentists, and all of the other professional persons who have been licensed for decades? I have yet to learn of such a proposal.

It is unfortunate that some pathologists and several of their organizations oppose licensure for laboratory personnel. I am unable to discover sound reasons for their doing so. Is it to defend the claim that the performance of laboratory examinations is the practice of medicine, and that they alone are privileged to make such examinations? How can such a claim be taken seriously when 40,000–50,000 technicians and technologists are engaged in the performance of laboratory examinations in this country while few pathologists are? Many pathologists believe sincerely that the supervision of clinical laboratories should remain exclusively theirs. I believe that they fear that licensure of scientists and technologists would confer legal status that would impair the authority of pathologists. Yet, during the past decade, the rise in the number of private laboratories directed by persons who are not physicians proves that the threat is perhaps greater without licensure. Any person with funds, whether qualified or not, can create a laboratory, in the absence of legal restrictions—a situation prevailing nearly everywhere.

I am told that there is some apprehension among pathologists that chemists, microbiologists, etc., are about to seek actively directorships of hospital laboratories. It is my belief that few clinical chemists would have the inclination to do so. My own career has been an unceasing struggle to diminish the encroachment of administrative responsibilities upon the scientific activities that I prefer, rather than to extend my authority. I have been happy to restrict myself to clinical chemistry, which I chose in preference to medicine or pathology, fields that I once considered as alternatives. I believe that hospital laboratories are, in general, best and most efficiently operated as a single unit.
under a single administrator with subdivisions for chemistry, etc., rather than as independent units. Most chemists working in hospitals would, I believe, share this view. On the other hand, some persons with broad training in health sciences may be competent to direct a diversified laboratory. These persons are not numerous, and I believe that reports of an influx of non-physician scientists into hospital laboratory directorships are very much exaggerated.

What should cause greater concern to pathologists and the medical profession are the large numbers of hospitals in this country that have been unable to find a pathologist to direct their laboratories, or those hospitals whose laboratories are visited briefly by a pathologist once a week or even less often. Here is a vacuum that cannot be allowed to exist indefinitely, and one that is a direct result of a scarcity created by the A.M.A. specialty board program. I should like to suggest that the pathologists might better devote more attention to the solution of this problem and less to the imagined encroachments of clinical chemists.

The position of the chemist and of other scientists working in fields related to health remains ambiguous. Some pathologists maintain that they are practicing medicine. As I have already indicated, this view is untenable. The only legal ruling that supports it is a widely publicized decision in a county court in Iowa, in what is generally held to be a poorly reasoned decision. Sporadic attempts have been made under the sponsorship of certain organizations of pathologists to obtain passage of laws that restrict direction of clinical laboratories to physicians, and undoubtedly other such efforts will be made. In Iowa, this provision was incorporated into law, and clinical laboratory examinations can be made only by or under the immediate supervision of a doctor of medicine, a doctor of surgery, or a doctor of osteopathy. Few physicians specialize in the laboratory sciences, and few others are adequately trained or competent to direct a clinical laboratory. Laws such as this, if upheld, which I think unlikely, would obviously intensify the problem of providing adequate supervision of private laboratories. There are already not nearly enough medically trained and competent laboratory directors to staff hospital laboratories. Therefore, to deny nonphysician scientists their rightful opportunity to work independently would impair the service now being rendered to physicians and patients and deleteriously affect the public welfare.

These recent overt attempts to exclude scientists from direction of laboratories, together with the history of previous attempts to do so outlined in my report to the A.M.A. Joint Committee (CLINICAL CHEMISTRY 5, 248 (1959), should be sufficient to persuade chemists, microbiologists, and technologists that licensure is necessary. Legally, clinical chemists have no well defined status, and, should their professional activities be challenged, they could claim only the fundamental right—namely, that of not being deprived of one's livelihood—that is by common law the privilege of all persons. It is evidently
necessary and prudent to attempt to obtain legislation for the purpose of defining the professional status of clinical chemists. This conclusion was reached some years ago by the Committee on Clinical Chemistry of the American Chemical Society, of which I have been chairman, and was stated in a resolution of the Council of that Society in 1953. I hope it will be endorsed by the membership of this Association.

BROADER PROBLEMS

The problem of licensure, however, is one that has much broader significance in the health field than the definition of the professional status of Clinical Chemists. Other professional groups share the problem and perhaps should also be included in such legislation. However, the most compelling reason for seeking legislation is the protection of the public against incompetence. In only a few states are clinical laboratory personnel required to present evidence that they are qualified. In other states nothing exists to prevent the incompetent, dishonest, or otherwise unqualified laboratory worker from performing examinations that may jeopardize the health and welfare. This is the overriding reason for supporting licensure.

What of the relationships of clinical chemists and clinical pathologists? I am certain that the fundamental objective of both groups is the same, namely, to provide the best possible service to the patient. I have already explained that I respect the professional knowledge and authority of the pathologist. Although their medical background and arduous course of postgraduate study should equip them for the direction and coordination of the clinical laboratory team, they have not, on the whole, provided adequate scientific leadership. In fact, the record of the past 35 years proves a lack of understanding of what such leadership requires. It cannot be reconciled with a master-servant relationship, nor with an assertion of proprietary claims to disciplines that have been developed by others in the public domain of science. It is not in the public interest to yield to a self-constituted group complete authority over fields as vital to the public health and welfare as clinical chemistry and clinical microbiology. No such grant of authority was ever made or intended. There is a danger that it may lead to subordination of public welfare to private advantage. Spokesmen for the pathologists seem to be only partly aware that the expansion of the scientific basis of medicine has altered the old concepts with which the physician and pathologist once functioned.

Moreover, many pathologists are not aware that the pathologist-technician team cannot properly cope with many of the multitude of problems arising continually in the clinical chemistry laboratory. Dr. H. P. Smith in his presidential address to the American Society of Clinical Pathologists last year said that he believes that the Ph.D. biochemist is wasted in the service laboratory. Dr. Smith is an eminent pathologist who evidently has not recently had to cope with such a laboratory. Anyone who is alert to what happens in a laboratory
providing chemical services knows that it creates an unceasing flow of challenging problems. After study in three universities and 30 years of subsequent study and investigative experience, I find that I am repeatedly obliged to utilize all of my knowledge and research skills to solve problems presented by supposedly simple procedures that are ordinarily taken for granted. If more pathologists realized that commonly used analyses such as those for blood-sugar measurements have taxed some of the better chemical talent of the past century, they might gain an improved appreciation of the need for chemists and for research skills in the service laboratory. I believe that the failure to recognize this need explains the poor performance that prevails in many laboratories in this country. I am certain that greater emphasis on investigative methods might advantageously be incorporated into residency and technician training in clinical pathology, and that more Ph.D. scientists rather than fewer are needed to maintain dependable laboratory services and to develop this aspect of the training program.

Some pathologists recognize the need and enlist the skills and research ability of scientists. Those who do not are failing in one of the cardinal obligations of the physician, that of obtaining the best and most expert advice and assistance when needed. In problems related to clinical chemistry, this will require the aid of a chemist.

Scientists in many fields were irritated by Resolution 12 passed by the House of Delegates of the American Medical Association in December 1958. This resolution stated, as many of you will recall, that "all paramedical personnel should work under supervision of physicians, serving as the hands of physicians, and not as independent agents." By adopting this resolution the House of Delegates failed to remember that much of the progress made by medicine and its allied sciences has been the result of the contributions made by chemists and other scientists, very often working independently of physicians. By proposing to subordinate scientists to the medical profession, the House of Delegates challenged the freedom of science. Science flourishes best in a climate of independence. The relationships between disciplines must be one of equality. I cannot believe that Resolution 12 expresses the conviction of the leadership of American medicine. In fact, I have had assurance to the contrary. Certainly the American Medical Association has been hospitable in its journals, its meetings, and in its organization to scientists possessing many types of training in many disciplines. Allow me then to express the charitable hope that the House of Delegates at that time did not really understand what it was endorsing.

If the practice of medicine is to develop a scientific foundation, it must depend ever more heavily on the allied professions. I have stated previously that the problems presented by disease are so complex and formidable that every resource, every trained person who can contribute to the solution of these problems, must be employed. Pathologists have a special responsibility to
mobilize these resources and to guide their employment for the alleviation of illness. They will find clinical chemists ready and willing to cooperate to the fullest extent of their abilities.

ADDENDUM: Since this talk was given, the American Medical Association's Committee to Study the Relationship of Medicine with Allied Health Professions and Services reported to the House of Delegates on the results of its meeting with representatives of the health sciences last spring. The report, which was accepted by the House of Delegates, placed strong emphasis on the need for better interprofessional interrelationship. It constitutes an admirable summary of the problem and offers hope that a satisfactory solution can be found.

JOHN G. REINHOLD, Ph.D.
Pepper Laboratory
University of Pennsylvania

SYMPOSIUM ON CLINICAL CHEMISTRY

The 1960 Symposium on Clinical Chemistry entitled, "Advances in Clinical Chemistry Methods," will be held Nov. 9-11, 1960, at the Frank E. Bunts Educational Institute, Cleveland, Ohio. This symposium, sponsored both by the institute and The Cleveland Clinic Foundation, brings together 18 experts in the fields of electrophoresis, chromatography and pH. The presentations will discuss the latest developments in the respective fields. Much of the special equipment under discussion will be seen in use in the laboratories of the Cleveland Clinic or will be demonstrated.

Registration for the symposium is limited. The full program and further information may be obtained by writing to the Education Secretary, The Frank E. Bunts Educational Institute, 2020 East 93rd St., Cleveland 6, Ohio.