The Position of Clinical Chemists and Clinical Chemistry in the General Scheme of Clinical Laboratory Work

Excerpts from the 1960 Report of the McKeown Committee*

You are already aware that a report was made by the McKeown Committee on "Relationships of Medicine with Allied Health Professions and Services" at the June 1960 meeting of the American Medical Association and that this report was adopted by the House of Delegates. Some pertinent excerpts from this report are included herein in the interest of more complete understanding of the trend that now exists in this area. Even the new name of the committee seems to be a significant indication of the direction in which these discussions are going. As you will recall, the committee was formerly designated "a committee to study paramedical areas in relation to medicine" [Our emphasis.—En.].

The McKeown report at the outset defines the categories of its studies as follows.

These categories are the relations with allied scientists and relations with professional and technical personnel.

The Allied Scientists—These scientists constitute the foundations of medicine and include Ph.D. colleagues in the basic medical sciences of anatomy, biochemistry, microbiology, pharmacology, and physiology. They are primarily engaged in education and research, and only a small segment of this total group participates in the personal application of services to individual patients.

The Professional and Technical Personnel—These health personnel usually are engaged in direct services to the physician and his patients. Included in this category are health personnel in the fields of medical technology, medical and psychiatric social work, occupational therapy, physical therapy, and x-ray technology, as well as others.

*Report to Dr. Arnold G. Ware, President, American Association of Clinical Chemists, of discussions held during the meeting of the Association in Montreal, Aug. 29, 30, and 31, 1960.
Whereas the general tone of the report recognizes the importance of the clinical chemist and microbiologist in clinical laboratory work, it seems that in the first paragraph of this definition the phrase "only a small segment of this total group participates in the personal application of services to individual patients" unnecessarily minimizes the increasingly important role of clinical chemists and microbiologists in the application of the basic sciences to medical laboratory work. Some figures compiled by Dr. W. B. Mason indicate that there is a current need for 8000 professional and supervisory clinical chemists. He also estimates that there is a need for 500 supervisory plus professional clinical chemists annually to fill jobs not now occupied by individuals with the proper training, and that the need will continue for some years to come. One need only look each week in the "Positions Open" section of Science to realize that more and more institutions are looking for clinical chemists to supervise that part of their laboratory. It seems a mistake, therefore, to minimize the importance of discussions of the position of clinical chemists in the general scheme of things, while greater emphasis is placed on the training and acquisition of medical technologists and others in that category. However, the use of the term "allied scientists" indicates a desirable trend.

The McKeown committee report goes on to state as follows.

Based on its studies over the past three years, the committee is convinced that the physician of today is confronted with the most complex and variable pattern of relationships in the health professions that has ever existed.

In a further attempt to analyze these complex relationships, the following factors are discussed in the report.

First: The increasing dependence of physicians, scientists, and health personnel upon each other because of the tremendous advance in the breadth and scope of scientific knowledge in the recent past and present. One of the many examples of this interdependence is American Medical Education. In 1958, there were two and one-half times as many Ph.D.'s as M.D.'s engaged in teaching and research in the basic medical science departments of anatomy, biochemistry, microbiology, pharmacology and physiology.

Second: The rapidly changing pattern of medical care resulting from scientific and socio-economic advances creates constantly expanding demands for a greater diversity of skills and abilities and for concomitant increases in numbers of individuals in these specialized fields. It is estimated that there are already some eight individuals in allied health activities for each physician engaged in patient care.

Third: The development of satisfactory interprofessional communications and sound relations in support of cooperative liaison among physicians, scientists and health personnel will materially reduce the misunderstandings between these groups and increase the application of health benefits to the public. This is the first A.M.A. Committee to meet with colleagues in the medical sciences, related professional and technical disciplines for discussions on matters of common concern leading to cohesive efforts in medical care.
It is relatively certain that no clinical chemist, be he hospital affiliated, the operator of an independent laboratory, or associated with a university medical school would argue the wisdom of any of these statements. The current major problem seems to be one of implementation of these ideas, particularly that relating to cooperative liaison among physicians, scientists, health personnel, etc. The McKeown Committee as it now exists, or the Intersociety Committee on Laboratory Services Related to Health, or both as they now exist, offer the beginnings of a forum where mutual problems concerning the conduct of clinical laboratory work could be discussed. Discussions should be conducted at one or both of these places in the hope that understandings fair to everyone concerned could be reached with a minimal amount of debate based on personal and professional ego or financial considerations. Or, as Dr. W. B. Mason has put it, "In my opinion, principles guiding relationships between organized professional groups should be pretty much the same as those guiding day-to-day relationships between individuals. Difficulties will arise whenever other principles are adopted." The ultimate goal of such discussions should be a solution of all these problems that is based on the necessity of insuring the patient and the community the best in medical care and services. This, of course, means that, in this era of high specialization and rapidly advancing scientific developments, each area of clinical laboratory science should be so organized that the work turned out in its name would be the best available. Obviously, specialists in each field are required to insure this end.

The McKeown Committee Report goes on to state that the problem areas relating to scientists allied to medicine fall into the following categories.

1. The professional need for cooperatively defining and mutually respecting areas of activity and responsibility for scientists who participate in the care of the patient.
2. The socio-economic need for concurrence between physicians and scientists on appropriate professional recognition and economic security which are consistent with an individual's professional competence and contribution for members of sciences allied to medicine.
3. The educational need for further joint endeavors directed toward the development of greater competency for the benefit of all.

The discussion of these points further states:

Misunderstandings seldom develop with the majority of allied scientists because they do not provide these direct services. It appears that most of the misunderstandings on service activities have arisen either when national agreements have been reached without first establishing effective interprofessional communications and liaison at the state and local level, or when unilateral policies have been adopted by scientific and medical organizations at the national level without prior consideration of the effects of these policies on related organizations at the state and local level.

Again these are concepts that seem simply to need implementation that
includes unprejudiced cooperation by the specialty societies concerned with clinical laboratory work. The committee quotes one of the participants, Dr. Chauncy D. Leake, President of the American Association for the Advancement of Science and past president of the American Society for Pharmacology and Experimental Therapeutics, as stating: "To have any group take an attitude of superior citizenship, I do not think will help very much in promoting interprofessional relations. The way is open and we are anxious to cooperate and I want it clearly understood that we are going to get farthest if we have respect and esteem for individual groups who have maintained standards that they have set up for themselves."

It seems evident that the Committee recognizes the need for skilled professional personnel in many different phases of clinical laboratory work and would voluntarily serve as a meeting ground where the various professional groups could gather to resolve the current difficulties.

The Position of the AACC Relative to the Role of the Clinical Chemist in Laboratory Work Related to Health

The various concepts of the position of the clinical chemist as it relates to clinical laboratory work have been well delineated in the reports made to the McKeown Committee as reported in the proceedings of this committee for 1959 and 1960. These reports were made at the 1959 meeting by John G. Reinhold as a representative of the American Association of Clinical Chemists and the American Chemical Society, by J. I. Routh representing the American Board of Clinical Chemistry, by Armond J. Quick representing the American Society of Biological Chemists, and by John F. Polli representing the American Association of Clinical Chemists. Additional discussions are published jointly in the 1960 proceedings of the McKeown Committee by John G. Reinhold, John F. Polli, and Kurt M. Dubowski in behalf of the American Chemical Society, the American Association of Clinical Chemists, and the American Institute of Chemists, respectively. Further discussions were also entered in the 1960 record by Joseph I. Routh representing the American Board of Clinical Chemistry, by Kurt M. Dubowski representing the American Institute of Chemists, and by Armond J. Quick representing the American Society of Biological Chemists. These reports are quite complete, and any additional discussion along these lines would be largely a recapitulation. However, an additional review of the position, aims, and goals of the clinical chemists may become necessary as the result of opposed opinions that have been published also in the proceedings of the McKeown Committee under the authorship of F. C. Coleman and L. G. Montgomery representing the College of American Pathologists, and by J. R. Schenken and J. F. Sheehan representing the American Society of Clinical Pathologists. An additional report, that of Harry P. Smith to the College of American
Pathologists, which was approved by the assembly and the board of governors of that organization in November 1959, has come recently to my attention. After a considerable review of the history of the relationships between basic medical scientists and the medical groups concerned with clinical laboratory procedures, the author of this report again concludes with the tacit assumption, not expressed in so many words, that the registered medical technologist is adequate to cope with the problems requiring expert attention in the clinical laboratory. This is a conclusion to which the clinical chemist cannot subscribe. Consequently it may become necessary to restate the position of the clinical chemist relative to this situation as well as others. A proposed restatement of the activities and goals of the organizations representing the clinical chemist is therefore appended hereto.

**Statement of the Position of the Clinical Chemist**

The contributions of chemistry and biochemistry to the methodology and to the vast storehouse of factual biochemical information relating to life processes hardly needs reiteration. The contributions of biochemists during the first 20 years of this century form the foundation upon which much of today's clinical chemistry, and also clinical pathology, are based. Fundamental contributions of the same nature over a vastly wider area of biochemical subdivisions have multiplied with extreme rapidity during the past 15 yr. To appreciate this fact, one need only to consider the journals in chemistry, biochemistry, clinical pathology, and clinical medicine, to name only a few, which carry articles concerning chemical methodology alone. The current rate of progress, both in biochemical methodology and in the elucidation of biochemical processes, constantly brings to light information that must be applied to medical problems. The essentiality of specialization within the field of chemistry if one is to be able to encompass both the procedures and the theoretical backgrounds and applications of these procedures is self-evident. The same consideration applies to many other areas of sciences basic to medicine. There can be little question, therefore, that these various specialties within the medical basic science fields are becoming so large that specialization at the professional level must be recognized as an absolute necessity. It follows logically that the specialist is going to expect, as a reward for his contributions, both professional recognition at a level commensurate with his competence, and sufficient economic security so that economic hazards do not interfere with the pursuit of his professional interests.

A statement regarding the clinical chemist's concept of his position in the general structure of clinical laboratory work is contained in a report made jointly by Drs. John G. Reinhold, John F. Polli, and Kurt M. Dubowski to the McKeown Committee in behalf of the American Chemical Society, the
American Association of Clinical Chemists, and the American Institute of Chemists, respectively:

The clinical chemist supplies factual chemical data to the physician. He may obtain these by his own work, or more often, by directing the work of assistants in the chemical laboratory. The basic methods of chemical analysis used in medical laboratories in this country were developed by chemists among whom Folin and Van Slyke may be cited as examples. Much of the attention of clinical chemists continues to be devoted to the development of new analytical methods for a study of constituents of the body fluids and tissues, or improvement of existing methods. However, biochemical investigations of a fundamental nature are often made by clinical chemists. Such investigations might include, to cite a few examples, the identification of previously unknown substances or agents in tissues, description of physiochemical relationships, studies of dynamic equilibria in body fluids, and numerous others. Some of the investigative activity of clinical chemists is conducted in collaboration with physicians. The chemist may collaborate in design of experiments, provide chemical skills, services and supervision, and participate in the preparation of reports.

Because of the clinical chemist's continuing contacts with chemistry and biochemistry, he serves as a link between chemists and biochemists working in research laboratories and the physician. The competent clinical chemist who keeps abreast of progress in the several branches of chemistry that are related to life processes can provide information concerning developments in these fields to the physician when requested to do so.

Guiding Principles for the Clinical Chemist

The above statement summarizes very well the activities and aims of the clinical chemist. However, to go on record once more, guiding principles for the clinical chemist may be stated as follows. The clinical chemist has dedicated himself to a life of service in which his activities are devoted

1. To the development and maintenance of standards of laboratory procedure of an excellence commensurate with the available techniques

2. To the improvement of clinical chemical laboratory methodology by critical evaluation and investigation of methods and by the development of new procedures for chemical evaluation of life processes

3. To the investigation of ways and means to bridge the gap between the body of scientific information relative to life processes and the application of that information in the clinical laboratory

4. To cooperation in every possible way with other areas of medical science in the endeavor to develop and maintain standards of excellence in the laboratory that will insure the very best possible service to the patient and to the community

5. To the promotion of educational programs for the training of clinical chemists at the doctorate level in order that the ever increasing demand for this service may be met adequately
6. To the establishment of programs activated by the individual clinical chemist and by his association leading to the establishment of recognition of the field to such an extent that he may be able to work in an atmosphere conducive to good service work and investigative efforts, to the end that the science may be constantly advanced.

Every clinical chemist is presently guiding himself by these principles, and will continue to do so to the best of his ability.

Problems Confronting the Clinical Chemist

Education

Item 5, above, requires additional comment. The paucity of training programs for clinical chemists has been officially stated before the McKeown Committee by J. I. Routh. This is one of the major problems now confronting the AACC. An active program must be instituted to persuade departments of biochemistry throughout the country to recognize the acute need for training programs in clinical chemistry. Every clinical chemist should have gone through the equivalent of training for a Ph.D. in biochemistry. The requirements for the training of clinical chemists is not, therefore, insurmountable, and could be managed with minor modifications. It is just as essential that students be encouraged to enter the field. They must be persuaded that to do so is not demeaning, and that professional recognition is just as obtainable in this field as in the field of basic biochemical investigation.

Clinical Chemistry and the Practice of Medicine

The operation of a clinical chemistry laboratory has frequently been interpreted as the practice of medicine, and the clinical chemist has been said to be engaged in that activity without proper qualifications. This concept is certainly not held by the clinical chemist himself in his evaluation of his role in clinical laboratory work. It is his responsibility, according to his own opinion, to supply factual information that can be correlated with other information by the physician in charge of the patient in order to arrive at a proper diagnostic or therapeutic interpretation. Interpretation is solely the responsibility of the physician, and the clinical chemist is well aware that no one except the physician in charge, who has seen all of the aspects of the case, is in a position to express a qualified opinion concerning the over-all evaluation of the clinical and laboratory findings. Therefore, to consider that the operation of the clinical chemistry laboratory, which furnishes the factual data, is the practice of medicine is entirely erroneous.

Ally vs. Competitor

Fundamentally, the clinical chemist considers himself to be the ally of the physician, a person to whom the physician can turn for thoroughly reliable chemical information. The aim of the clinical chemist is to see that this in-
formation is correct. He also holds himself in readiness at any time, at the request of the physician, to discuss the significance of the laboratory data and to enter into discussions of the relation of such data to the over-all consideration of basic biochemical processes.

To quote once more from one of the presentations made to the McKeown Committee on behalf of the American Physiological Society, Dr. John S. Gray of Northwestern University Medical School remarked: "In summary, physiologists and physicians meet primarily in the ivory towers of education and research, rather than in the marts of competition. Accordingly, relative harmony prevails." This statement is a rather subtle touch upon one of the sore spots of much of the current controversy. Actually, competition from the monetary point of view should enter very little into considerations concerning the role of the clinical chemist in clinical laboratory work. This is evident from the present-day shortage of clinical chemists—even in institutions that have recognized the need for supervision of clinical chemistry laboratories by a well trained and fully qualified chemist. One has only to recall the figures quoted above on the estimated need for qualified clinical chemists in the near future, as a result of the rapid growth of medical facilities and population, to see the truth of this statement. The demand for acceptable laboratory work already exceeds the supply, and there appears to be room for all qualified people in the field.

Suggested Remedial Measures

Discussions should be held between the groups concerned with laboratory work related to health. The primary considerations in these discussions should be twofold:

1. A common meeting ground must be found wherein members of the specialties concerned with clinical laboratory work, or laboratory work related to health, can resolve existing difficulties and misunderstandings, recognizing each other's qualifications and limitations in an atmosphere of mutual respect and consideration.

2. The ultimate aim of such discussions must be the attainment of agreement concerning the position of each group of health scientists in the development of clinical laboratory work in a fashion such that the first consideration will be the welfare of the patient and the community insofar as this depends upon such laboratory work.

Further, an atmosphere of cooperation must be reached to guarantee adequate control of the quality of laboratory work. Such an atmosphere will go far toward promotion of the development and expansion of laboratory coverage now available so that constantly increasing benefits may accrue to the public at large. Any other consideration is based on special benefits to special groups and there can be no argument that will justify such an approach. The explosive expansion of basic medical science in the last few
years should make it obvious that no individual or member of any specialty can hope to spend the required time or have the required experience to make him an expert in all areas of medical laboratory work. Mutual recognition of the rights of all groups by every other group—and what is more important, the mutual recognition of the need of the field as a whole for all the help it can get, from the most highly specialized skills obtainable—is of paramount importance to the proper development of the clinical laboratory.

Qualifications for Heads of Clinical Chemistry Laboratories

The AACC has given its support to the American Board of Clinical Chemistry and will continue to do so. Board certification represents one means of the establishment of standards for evaluation of individuals who seek to qualify as directors of clinical chemistry laboratories. W. B. Mason, a clinical chemist has defined the qualifications for professional clinical chemists as follows. The clinical chemist should have "academic training at the Ph.D. or M.D. level with solid grounding in analytical, organic and physical chemistry; firm understanding of statistics and modern instrumental methods (including optical and electronic instrument designs); good appreciation of basic physiological and biochemical mechanisms; broad experience in practical clinical chemistry. His activities include research, teaching, administration, consultation with physicians, hospital administration, etc., and may include direct responsibility for day-to-day operation of a clinical chemistry laboratory. The clinical chemist may hold academic appointment in a department of clinical chemistry, biochemistry, pathology, medicine, etc., and may be member of a hospital administrative staff or operate a private clinical chemistry laboratory."

The above statement sums up the desirable standards for professional qualifications, particularly the statement "a solid grounding in analytical, organic, and physical chemistry, etc.," which implies major formal training over and above the basic courses in the above-mentioned branches of chemistry. Adherence to such standards seems essential to the maintenance of the degree of respect due the profession.

A considerable body of opinion holds that licensure laws for directors of clinical chemistry are desirable—indeed, that they are essential to adequate control of clinical chemistry laboratory work. This is the official opinion of the American Chemical Society as frequently expressed by Dr. John Reinhold as their representative. To my knowledge, the AACC has not taken an official stand on this question. If this is the case, a policy should soon be established. The question is likely to come up very soon. The licensure problem will require much thoughtful discussion if a workable solution is to be reached, and it is a problem to be solved in conference between representatives of all the groups concerned.

To summarize, it may be safely stated that the problem involved in the
development of the clinical laboratory will be largely minimized with the development of an atmosphere of mutual respect and understanding between groups at the national level as it now exists so frequently at the local level. This cannot be attained by unilateral action, but must be developed at the conference table. The American Association of Clinical Chemists is ready and willing to participate at any time, with the full realization that very little can be accomplished constructively in an atmosphere of antagonism.
Excerpts from Joint Meeting with the A.M.A. Committee on the Relationships of Medicine to Allied Health Professions and Services

Interprofessional Relationships with Special Reference to Clinical Chemistry

A joint statement by John G. Reinhold, Ph.D., John F. Polli, Ph.D., and Kurt M. Dubowski, Ph.D., in behalf of the American Chemical Society, the American Association of Clinical Chemists, and the American Institute of Chemists, respectively, follows.

1. The clinical chemist supplies factual chemical data to the physician. He may obtain these by his own work, or, more often, by directing the work of assistants in the chemical laboratory. The basic methods of chemical analysis used in medical laboratories in this country were developed by chemists among whom Folin and Van Slyke may be cited as examples. Much of the attention of clinical chemists continues to be devoted to the development of new analytical methods for study of constituents of the body fluids and tissues, or improvement of existing methods. However, biochemical investigations of a fundamental nature also are often made by clinical chemists. Such investigations might include the identification of previously unknown substances or agents in tissues, description of physiochemical relationships, studies of dynamic equilibria in body fluids, and numerous others. Some of the investigative activity of clinical chemists is conducted in collaboration with physicians. The chemist may collaborate in design of experiments; provide chemical skills, services and supervision; and participate in the preparation of reports.

Because of the clinical chemist's continuing contacts with chemistry and biochemistry, he serves as a link between the physician and the chemist and biochemist working in research laboratories. The competent clinical chemist who keeps abreast of progress in the several branches of chemistry that are related to life processes can provide information to the physician concerning developments in these fields.

The clinical chemist infrequently deals with patients directly and only for obtaining samples at the specific request of a physician. He refrains from discussing results of analyses with the patient. Since he reports only

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factual findings to a physician, he never applies his observations to diagnosis or treatment of illness, nor does he profess to be able to do so.

The clinical chemist differs from the chemical technologist by having a scholarly training together with a scientist's knowledge and motivation. He has the capability for autonomous professional action, including the conduct of research and academic instruction, and can accept responsibilities encompassed in the control and direction of clinical chemistry laboratories.

2. The primary need in the field of clinical chemistry is for a sufficient number of seasoned chemists with clinical laboratory training to fill the many vacant positions for chemists in hospital and research laboratories. A still larger number of well-trained chemists will be required in the future to fulfill the needs of the many hospitals of 100 to 200 beds or larger that now have no clinical chemist. One of the noteworthy trends in medicine is the increasing dependence of the physician upon chemistry. New chemical facts concerning the behavior and mechanism of disease, promising to provide the physician with effective new tools for diagnosis and treatment, are steadily being discovered by clinical investigators. However, much of the newer knowledge remains unavailable to physicians and their patients because the necessary chemical skills and laboratory facilities are not generally available in hospital laboratories.

Few chemists are specializing in clinical chemistry. This is partly because financial rewards in industry are larger and because industry has an active recruiting program. However, the scarcity of organized programs for training of clinical chemists is an important reason for the small number of chemists that enter the field. Not the least important deterrent has been the inhospitable climate created by the attitudes of the College of American Pathologists and the American Society of Clinical Pathologists. The former particularly has made it clear that chemists were unwelcome intruders in the clinical laboratory. Moreover, as was explained at the April meeting last year, overt efforts have been made to prevent chemists and biologists from directing chemical and biological laboratories that serve physicians. These actions have been based on the spurious grounds that the mere performance of a laboratory examination is the practice of medicine. It is not surprising, therefore, that a graduate student in biochemistry should hesitate to enter a field in which his status is beclouded, especially when many alluring offers come from competing fields in which his professional status is fully established and respected.

It should be noted that the Registry of Medical Technologists of the American Society of Clinical Pathologists has recently announced that it will confer the title of "Chemist" upon technologists who have completed a short period of practical training in a hospital laboratory. To be sure, these technologists must have had a chemistry major in college. However, chemists in the past have rightfully become chemists through rigorous training received
from faculties of chemistry in colleges and universities. If the Registry successfully persists in this plan, which it announced without consultation with any of the chemical societies, it is evident that the title "chemist" will not have quite the same significance that it formerly held.

This action illustrates a fundamental misconception among clinical pathologists—namely, that a technician can adequately take over the role of the chemist in clinical laboratories. It is this failure to recognize the complexity of the chemical methods used for even ordinary examinations that contributes to the poor performance of clinical chemical procedures that demonstrably prevails in many hospital laboratories. When difficulties arise, and this may be often, their solution requires the application of the research techniques of chemistry, with which few clinical laboratory technologists or pathologists are equipped. It is chemists with appropriate training in research who can best assure the dependability of chemical examinations.

3. Most clinical chemists work in hospital laboratories directed by pathologists. Often these are pathologists who are not completely in accord with the stand of their national societies. Most chemists seem to be willing to acknowledge that it is advantageous for a hospital laboratory director to be medically qualified. A recent sampling of opinion among clinical chemists has shown that few would care to alter materially the presently prevailing organization of pathologist-directed laboratories by substituting autonomous chemical laboratories. Chemists as a group are devoted to chemistry and adverse to unwarranted or unnecessary involvement in administration. However, the chemist has a long and distinguished professional tradition and expects to have his professional status acknowledged and respected. For example, seriously impaired chemical services in a hospital laboratory, and profound dissatisfaction on the part of the chemist as well as of the staff of the clinical services have resulted when a pathologist insisted that all communication between a highly qualified chemist and clinicians be conducted with the pathologist as intermediary. It is only by treating the chemist as a member of a respected profession that pathologists can successfully direct their efforts as members of a clinical laboratory team. Additionally, the traditional right of the chemist to direct autonomous clinical chemistry laboratories must be respected.

In general, chemists will prefer to be employed by a hospital or other institution rather than by a private employer. An institution offers greater security of employment, greater prestige, and better protection against idiosyncrasies of the individual employer. Therefore, this is another among many reasons why the current effort by some pathologists to convert hospital clinical laboratory services into private personal practices is unfortunate. As the scientific basis of medicine expands and the needs for elaborate equipment and skilled personnel become greater, this plan will become increasingly incongruous.
4. The academic preparation that is necessary for clinical chemists has been studied particularly by the Committee on Clinical Chemistry of the American Society of Biological Chemists and the American Board of Clinical Chemistry. The American Association of Clinical Chemists also has in its records the reports of a number of committees that have evaluated the training of clinical chemists. All reports agree that chemists who wish to enter medical laboratories should receive the same basic training as that required for a doctorate in biochemistry or chemistry. This must be supplemented by practical training, additional special academic work, and experience in the laboratory of chemistry in a teaching hospital approved for such training.

Programs for both phases of training are currently available and actively in progress in only four or five medical centers. Comparatively few departments of biochemistry have any interest in training clinical chemists. Generally, the preoccupation with teaching and research in pure biochemistry is so complete that the student who might have studied clinical chemistry often is deflected into the fields in which his instructors are more interested.

Any school of medicine could establish with little difficulty a curriculum in which a graduate student would be given the opportunity to work in the associated teaching hospital’s chemical laboratory while fulfilling the requirements for a doctorate in biochemistry. The assistance of the American Medical Association in encouraging the creation of training programs for clinical chemists in medical schools would be most helpful.

5. In discussing means of developing more effective relationships with physicians it is important to remember that excellent relationships exist between clinical chemists and physicians—including clinical pathologists—where individuals are concerned. The difficulties are created primarily by the policies of the two national organizations of pathologists against actual or potential “competition.” The laboratory technics of clinical pathology were largely borrowed from chemistry and biology. Since there is virtually nothing inherent in the technics that requires those using or supervising them to have the knowledge or skills of a physician, it is only by control of training, by registration of technicians pledged to work only for physicians, and by vigorous and outspoken opposition to all others who attempt independent operations in the field that the clinical pathologist has attempted to maintain his domination over the performance of clinical laboratory examinations. This more recently has been carried a step further by successful sponsorship in several states of laws restricting directorships of so-called clinical laboratories to physicians. The justification for these actions was that the responsibility for the performance of clinical laboratory examinations must be reserved to an individual with an M.D. degree. One may ask at what point in the 4 yr. of training for an M.D. degree its holder becomes qualified to perform or supervise the many complex chemical examinations that have become an essential to comprehensive service. Certainly it is not in the usual course
in medical biochemistry. Actually, the M.D. degree . . . does not endow its holders with the competence needed for direction of a modern chemical laboratory that provides comprehensive coverage. Competence comes only after years of additional training, as clinical pathologists indeed recognize. The claim of unique authority for every M.D. in the performance or direction of clinical laboratory work is based on sophistry. We agree that in some circumstances control by physicians may be the preferred arrangement, but to make such control obligatory in all circumstances by legislative action is unsound and unethical. It does create a monopoly by law. It will tend to make laboratory services scarce and expensive. It is legislation conferring special privileges on a small group. It is not in the public interest.

The clinical pathologist does have a special contribution to make; one based on his comprehensive knowledge of disease processes and mechanisms. His medical background and diversified training in the laboratory sciences make him the person from whom clinicians would naturally seek aid and advice. Surely he can afford to be tolerant concerning the performance of laboratory examinations by scientists in those disciplines upon which clinical pathology is based without jeopardizing his financial security or position in medicine.

Many pathologists, some of them distinguished leaders in their field, have privately informed the writers that they disagree strongly with the attitudes and policies on interprofessional relations of the College of American Pathologists and the American Society of Clinical Pathologists. It is worth noting that in the United Kingdom clinical pathologists and clinical chemists maintain close and harmonious cooperation. Joint meetings are held. The same excellent journal is shared. This is true also of the Scandinavian countries and the Netherlands. Insofar as chemists are concerned, it would also be true in this country.

**Additional Remarks**

Dr. Polli (AACC)

The demand for clinical chemists appears to be increasing at an extremely rapid rate. Major factors in the shortage of persons entering this field have been the compensation offered and professional recognition granted. Practices by any group that tend to decrease the attractiveness of careers in clinical chemistry are indeed reprehensible, since they are opposed in the long run to the public welfare and undoubtedly are detrimental to patient care. One effective step in increasing the number of professionally trained clinical chemists would be for the AMA and other physician groups openly to recognize the importance of clinical chemistry to modern medicine and to recognize clinical chemists as colleagues. This is certainly being done on an individual basis in most of the progressive medical centers of the country. Relatively
few individuals are presently attracted into clinical chemistry because of uncertainties regarding professional status and salaries. It is also doubtful that present educational programs will supply even one-third the required supervisory and professional clinical chemists for some years to come. The situation clearly needs correcting. Medicine and science are here to stay and will continue to grow in scope and importance. Since they are dependent on each other, medical and scientific groups should be able to adopt an attitude of mutual interest and confidence. The skills of many related sciences are essential to the continued progress of medicine. This requires close collaboration between the profession of medicine and the scientific professions.

Dr. Dubowski (AIC)

Because these matters obviously affect the spirit of practicing, competent clinical chemists, the Institute has interested itself in those aspects that affect clinical chemists. I would like to bring to the attention of the participants in this conference a recent resolution (which was previously brought to the attention of Dr. McKeown's Committee) adopted by the American Institute of Chemists at Atlantic City, May 7, 1959, and approved at the National Council Meeting Oct. 1, 1959:

Resolved,

That the American Institute of Chemists go on record, and further make known its position to Federal, State and local legislative and executive bodies and other interested organizations and persons, that

1. Chemists adequately qualified by education, experience, and competence, including those chemists certified by the American Board of Clinical Chemistry, are qualified to engage in the independent professional practice of clinical chemistry and independently to direct, conduct, and operate clinical chemistry laboratories without the supervision of members of any other profession; and

2. The American Institute of Chemists, in the public interest, opposes the enactment of any laws, statutes, or regulations which would deny to such qualified clinical chemists the right independently to conduct clinical chemistry laboratories.

Representative of the ASBC

Perhaps an even more cogent reason for the lack of interest of the biochemist in applying his subject to clinical medicine, and for his unwillingness to encourage students to enter a laboratory career in clinical chemistry, is the lack of prestige given to this branch of chemistry and the tendency to rate pure science much higher than applied. The biochemist is well aware that recognition and advancement are much more likely to come from successful work in pure biochemistry than from practical accomplishments.

Unless the clinical chemist is allowed certain prerogatives and the opportunity to attain the status of an expert, few men will be attracted to this profession. The tendency to reduce the clinical chemist to the status of the
medical technologist has disastrous results; it will discourage the well-trained clinical chemist from entering the field. As a result, the pathologist or clinical pathologist will have only medical technologists to handle the problem of chemistry. It can hardly be expected that new developments in biochemistry will readily find their way into the clinical laboratory.

Representative of the American Board of Clinical Chemistry

At present the demand for well-trained clinical chemists with experience far exceeds the supply. Many hospitals have realized their need for a clinical chemist to supervise the chemistry laboratory. They soon find that a well-trained experienced chemist is in short supply.

Board-certified clinical chemists should be accorded the status, salary, and opportunity for independent effort enjoyed by physicians. They should be considered as consultants on all matters pertaining to clinical chemistry and definitely not be classified as super technicians.

News Section

THIRTEENTH ANNUAL MEETING
NEW YORK CITY

The Thirteenth Annual Meeting of the American Association of Clinical Chemists will be held in New York City Aug. 28-31, 1961. Extensive plans are being made for this meeting, which will bring together the leading clinical chemists from this country and from abroad for 3½ days of scientific sessions, exhibits from research institutions and of commercial developments, social gatherings, and visits to laboratories in the New York area.

The Program Committee of the New York-Metropolitan Section is arranging symposia and visiting speakers on the following subjects of acute interest: (1) Gas chromatography in clinical chemistry, (2) Mucopolysaccharides, and (3) Haptoglobins. These symposia are planned for the morning sessions; the after-noon sessions will comprise parallel programs of contributed papers.

The members of the American Association of Clinical Chemists and of Societies affiliated with the International Federation of Clinical Chemistry Societies are invited to submit titles and abstracts of their intended presentations on or before May 1, 1961. The abstracts of the scientific contributions will be published in CLINICAL CHEMISTRY and will be available at the meeting.

SCIENTIFIC SESSIONS
THIRTEENTH ANNUAL MEETING

The Program Committee of the Thirteenth Annual Meeting of the AACC invites the membership to present their scientific contributions at the New York Meeting.

Because of the time required to prepare the program, abstracts of papers must be received by the chair-
man of the committee on or before May 1, 1961. They should be sent to Dr. HARRY Sobotka, Chemistry Department, Mount Sinai Hospital, New York 29, N. Y.

The abstract should be limited to 200 words or less and must give the title of the paper, the author's name(s), and the hospital, university, or laboratory affiliation (in this order), followed by the text. The name of the author presenting the paper should be underlined. Abstracts should be typed double-spaced, and one original with two carbon copies should be submitted.

Abstracts that arrive after the deadline, that are submitted without the required number of copies, or that require extensive editing, cannot be accepted.

For guidance in the form of the abstract please see pp. 387-410 in the August 1960 issue of CLINICAL CHEMISTRY. The text should include concise statements of (1) the problem investigated, (2) the experimental methods used—without details, and (3) the essential results obtained. Each paper will be allotted a total of 15 min. of which 10-12 min. are for the presentation and 3-5 min. for the discussion and questions. Authors should be guided accordingly.

A period and room will be set aside for discussion of papers read by title, provided the author makes available 50 mimeographed copies of the complete manuscript prior to or on the first day of the meeting.

The full scientific program and the abstracts of the contributed papers will be published in the August issue of CLINICAL CHEMISTRY. The titles, authors and subjects will be indexed in Vol. 7 of the Journal.

RULES GOVERNING PAPERS

According to a resolution of the National Executive Committee, "The Association shall have first right to publish papers presented at National Meetings of the Association. However, after a paper has been accepted for the meeting program or after its presentation, the author may request its release. Under no circumstances shall release, if granted, permit publication before the oral presentation. Within 30 days after receiving a request for release (and the complete manuscript, if the Board of Editors requests it), the Association shall give the author a decision to release the paper or to accept it for publication subject to the usual editorial revision."

Requests for release should be addressed to: Board of Editors, CLINICAL CHEMISTRY, Box 123, Lenox Hill Station, New York 21, N. Y.

Manuscript form for papers submitted for publication can be found under Editorial Information, which appears in every issue of the Journal.

BOARD OF EDITORS

At the recent meeting of the National Executive Committee of the AACC, which was held in Montreal, Canada in August, the committee voted to enlarge the Board of Editors of CLINICAL CHEMISTRY to 10 members, each to serve a 3-yr. term.

The terms of service of Drs.
JOSEPH I. ROUTE and MARSHHELLE H. POWE expired at the close of 1960. The Executive Committee elected the following members to fill the existing vacancies and the newly created board positions for 1961.

MAX M. FRIEDMAN, New York, N. Y.
RICHARD J. HENRY, Los Angeles, Calif.
SANFORD H. JACKSON, Toronto, Canada
BERNARD B. LONGWELL, Albuquerque, N. M.
JULIUS SENDROI, Jr., Bethesda, Md.

1961 VAN SLYKE AWARD

Dr. SAMUEL NATELE, biochemist at the Roosevelt Hospital, New York, has been selected as the 1961 Van Slyke Award Medalist. This award of the New York Section of the AACC is sponsored jointly by the Ortho Research Foundation and Standard Scientific Supply Corporation. It consists of a medal bearing the likeness of the distinguished clinical chemist whose name it bears, a scroll, and an honorarium.

The 1961 award will be presented to Dr. NATELE for his outstanding achievements in advancing the practice of clinical chemistry. The presentation will be made at a dinner meeting to be held in March. It is hoped to make this meeting a major scientific event as plans are being made to honor all the former medalists at this meeting.

All members of the Association and their colleagues are invited to attend. Specific announcements will be mailed to all New York Section members. Inquiries should be ad-
dressed to Dr. BERNARD KLEIN, Secretary, Biochemistry Laboratory, Veterans Administration Hospital, Bronx 68, N. Y.

REPORTS FROM THE SECTIONS

New York-Metropolitan

The New York-Metropolitan Section held a symposium on "Abnormal Tyrosine and Phenylalanine Metabolism" on the evening of Nov. 2, 1960, at the New York Academy of Sciences. Speakers for the evening were W. EUGENE KNOX of the New England Deaconess Hospital and Harvard Medical School, and GEORGE A. JERVIS of the State of New York Department of Mental Hygiene at Letchworth Village. A dinner preceded the meeting.

The title of Dr. KNOX's talk was "The Environmental Control of Phenylalanine and Tyrosine Metabolism." He discussed certain aspects of the biochemistry of several enzymes involved in the degradation of tyrosine and phenylalanine to citric acid cycle intermediates, and to other metabolites under pathological conditions. Mention was made of the genetic control of particular steps, but primary emphasis was given to the process of adaptive enzyme control. The roles of these processes in premature infants and in scorbutic animals was also discussed by Dr. KNOX.

The title of the talk given by Dr. JERVIS was "Pathological Abnormalities of Tyrosine and Phenylalanine Metabolism." The speaker discussed clinical and biochemical aspects of diseases manifesting phenylketonu-
ria, particularly phenylpyruvic oligophrenia.

**DR. MARTIN BURGER, 1908–1960**

Dr. Martin Burger, age 52, a research biochemist at Brooklyn Jewish Hospital, a chemistry teacher at Midwood High School, and formerly a chemist for the N. Y. C. Department of Purchase and the Department of Health Research Laboratories, died in New York Oct. 3, 1960.

Dr. Burger was a member of Sigma Psi, American Chemical Society, American Association of Clinical Chemists, National Science Teachers Association, Chemistry Teachers Club, and a former member of the American Institute of Chemists and the American Association of Bacteriologists. He was the author of *Bacterial Polysaccharides* and numerous research papers in analytical chemistry and biochemistry. His recent research work resulted in the publication of several papers that constitute a significant contribution to the modern theory of mechanisms of calcification in bones and teeth. In 1958 the American Chemical Society awarded him a Nichols Foundation scroll for excellence in the teaching of chemistry.

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**Nominations for the Ames Award**

Nominations are invited for the 1961 Ames Award of the American Association of Clinical Chemists. This Award consists of $1000 and a bronze medal. It is made annually to a member of the Association who has made outstanding contributions to clinical chemistry.

The rules for making nominations are as follows:

Any member of the American Association of Clinical Chemists (except a member of the Award Selection Committee) may submit one nomination for the Award. Such proposal must be accompanied by a biographical sketch of the nominee and evaluation and appraisal of the work and accomplishments of the nominee which suit him for candidacy for the Award. A complete list of the nominee’s publications is not necessary; there should be some discussion of the field of his work in general and of his publication record. Seconding letters are not necessary; all of the information and arguments regarding the nominee should be marshalled by the nominator and included in one statement. Five copies of the nomination must be furnished for distribution to the members of the Award Committee.

Nominations should be sent to Dr. Robert L. Dryer, Secretary, The American Association of Clinical Chemists, University Hospitals, Iowa City, Iowa. The deadline for receipt of nominations is June 1, 1961.