Clinical Chemistry—Quo Vadis?

Whether clinical chemistry had its beginning in ancient India, China, or Egypt or in 1526 when Paracelsus proclaimed that chemistry is the handmaiden of medicine, the contributions of clinical chemistry to the practice of medicine have been significant. From humble beginnings, clinical chemistry has grown into the largest and most demanding component of laboratory medicine. Teaching and research contributions by clinical chemists have increased in quantity and importance, and the number of clinical chemists in the U.S. has reached several thousand. Why then have clinical chemists in the U.S. not gained the recognition accorded their counterparts in other countries? We believe the reason is a lack of academic and professional identity, a decline in dedication to the tenets of clinical research and teaching, and a failure of appropriate leadership by the professional organizations.

Clinical chemistry is perceived as a triad of service, research, and teaching, to which management has been added as a fourth component. Many clinical chemists have recently emphasized the development of analytical expertise and management, unfortunately at the expense of teaching, research, and the application of the science of clinical chemistry to clinical medicine. This development, which has been partly prompted by increased service pressures, has not been counterbalanced by a personal and professional commitment to research and teaching. To live up to this challenge and commitment, and to advance the status of the profession, clinical chemists must be willing to commit time beyond the usual working hours. Applying for grants requires extraordinary energy, but once obtained, grants will allow chemists to pursue research despite service pressures. Research involvement increases the level of professional satisfaction in individuals and heightens the credibility of clinical chemists as a group. Commitment to research and teaching must be nurtured in our graduate and postgraduate training programs and must be supported and encouraged by our national organizations.

Clinical chemistry has failed to become established as a profession in the exact sense of the word—a vocation requiring clearly defined, advanced education and involving intellectual training comparable to that required for fields such as medicine, engineering, and teaching. The lack of professional status does not reflect a deficiency of skills or intellectual abilities of the practitioners but rather a lack of clearly defined and accepted qualifications. Contributing factors are the possible obsolescence of training goals, misplaced priorities, and, sometimes, lack of proper motivation.

Clinical chemists and the American Association for Clinical Chemistry (AACC) must accept at least partial blame for making little or no progress towards establishing prerequisites that will cause society to perceive the occupation as a profession—for example, the establishment of academic departments of clinical chemistry. In this respect, the United States lags significantly behind other countries. A look at a recent issue of *Clinical Chemistry News* shows that training programs in clinical chemistry are located in academic departments of pathology, biochemistry, chemistry, clinical pathology, laboratory medicine, obstetrics & gynecology, medical technology, and clinical science. Some of the programs are not even located in an academic institution.

It was largely this diffuse academic identity, together with a failure to emphasize adequately the teaching and research components of our profession, that led to the foundation of the National Academy of Clinical Biochemistry (NACB) in the United States. The support this organization has received indicates that many clinical chemists are concerned about the lack of a defined academic base. Thus, we think that this is an opportune time for the AACC and the NACB to enter into discussions aimed at amalgamating the two organizations, with the NACB serving as a semiautonomous arm of the AACC. Such a move could increase the resources of both organizations, strengthen the pursuit of academic goals of clinical chemists, and provide a better forum for intellectual stimulation. Clinical chemists, both individually and through the national organizations, should also identify and properly nurture affiliations with other professionals who have direct interests in clinical chemistry—internists, endocrinologists, pediatricians, academic pathologists, and hospital administrators.

The AACC should re-evaluate its role in the certification process of clinical chemists. Certification in itself does not change the status of clinical chemists. We must redefine the role of the clinical chemist, adjust our training programs to prepare clinical chemists to meet that role, and then inform the medical community of the importance and the results of these efforts. The AACC must provide resources to support these processes and to increase the visibility of the training programs and the certification process. The limited success of the present certification programs is due, at least in part, to the fact that our professional organization has largely abandoned our certifying agencies.

Contributions to recent issues of *Clinical Chemistry* indicate that the research productivity of U.S. clinical chemists has declined relative to that of colleagues in other countries. Furthermore, a great majority of contributions to this journal appear to be solely analytical in nature, so that clinical chemists are perceived as being predominantly analytical chemists.

Clinical chemists should intensify their research activities, and they should be encouraged to submit important research contributions to their journal, *Clinical Chemistry*, which has earned a remarkable standing in the clinical chemistry community around the world. Such contributions should include research and case reports, demonstrations of the clinical relevance of analytical contributions, and review articles. (At present, review articles can be found more readily in commercial publications than in *Clinical Chemis*
The expanded scope of the content of the journal would also increase the readership base and contribute to broader recognition of clinical chemistry as a profession. Indeed, we should capitalize on advances in knowledge and technology and demonstrate, through both publications and actions, that we are members of the health-care team who can contribute materially to the diagnostic process and the understanding of disease.

The AACC should refocus on its main reasons for existence, namely, advancement of the profession (for the ultimate benefit of the patient) and service to its membership. Professional leadership should make a unified commitment to define the goals and objectives of clinical chemistry and to provide the direction needed to achieve these goals. In this pursuit, we should separate the concept of operating with good business practices from that of becoming a business organization that has lost its primary reasons for being. The AACC has significant resources that could be called upon in redefining goals and formulating policies. Senior members and past presidents of the association are valuable resources that presently go largely untapped. Their support could also help provide the basis for a more effective involvement in government affairs.

The AACC, through its committees, should also revitalize its efforts toward the standardization of laboratory processes, including methodology and quality control. It appears that the AACC has abdicated most of the responsibility in this area. Some present programs of the AACC that do not live up to highest standards are wasteful and should be redirected or discontinued.

The national meeting of the AACC—impressive in its scope of exhibits and attendance—must also be eminent in the intellectual stimulation it affords participants. Symposium presentations should be of the highest caliber and should reflect our commitment to the total health-care process. The poster sessions should be opportunities for intense and spirited debates over important advances, not just presentations of new or improved methodological concepts. Methodology is important, but the extreme dominance of methodology over research and over the clinical application of analytical principles is the cause of some of the problems that we identified above.

In summary, clinical chemistry in the United States is at a point in its evolution when it should have achieved a greater visibility and stature than has been the case. This is due to failures of both omission and commission. This situation is not irredeemable; however, the achievement of a status comparable to that enjoyed by established professions and clinical chemists in other countries requires the redirection of professional leadership to the academic, scientific, and service tenets which appear in danger of abrogation.

The thoughts presented here may need to be supplemented to achieve the desired goal and may meet with some disagreement. However, if they stimulate a spirited and fruitful debate on the status, goals, and future of clinical chemistry, they will have achieved their purpose.

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