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The conference objectives were to review the forces that are changing manpower needs and to seek ways of staffing medical laboratories more effectively. Seven aspects of the problem were treated: (1) need for detailed analysis of personnel needs (2) effects of technology and automation on laboratory practices, (3) attracting, educating, and retaining qualified personnel, (4) achievement of higher-quality education and training, (5) ways of keeping up to date, (6) career mobility and equivalency, and (7) certification and licensing of personnel and accreditation of schools. Some of the recommendations made were: (1) reassess career and training categories, (2) formulate a system for nationwide workload reporting, (3) recruit from such allied fields as chemistry and physics, (4) help colleges with their medical technology courses, (5) encourage 4-year schools to strengthen their baccalaureate and graduate programs (6) improve and coordinate continuing education, (7) advise use of self-teaching media to save instruction time, (8) develop equivalency tests to increase mobility between categories and levels, (9) provide licensing agencies with both scientific and public advisors, and (10) establish a national accreditation agency. (HH)

manpower for the medical laboratory

A REPORT OF A CONFERENCE OF GOVERNMENT AND THE PROFESSIONS IN WASHINGTON, D.C.

October 11–13, 1967

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Public Health Service

manpower for the medical laboratory

THE NATIONAL CONFERENCE ON EDUCATION AND CAREER DEVELOPMENT OF THE NATIONAL COMMITTEE FOR CAREERS IN MEDICAL TECHNOLOGY

October 11–13, 1967

A SUMMARY REPORT

Sponsored by
National Committee for Careers in Medical Technology
and the
Cancer Control Program, National Center for Chronic Disease Control, Public Health Service, U.S. Department of Health, Education, and Welfare
With the cooperation of
National Council on Medical Technology Education
Bureau of Health Manpower, Public Health Service
National Communicable Disease Center, Public Health Service
at the
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THE CONFERENCE FORMULA

This interdisciplinary conference on "Manpower for the Medical Laboratory" was concerned with personnel below the level of laboratory director. The positions under consideration included the three principal categories of certified personnel—medical technologists, cytotechnologists, and laboratory assistants—as well as other professional and associated staff members such as chemists, biologists, technicians, and aides.

The program included (1) keynote addresses and a symposium to provide information about the conference background, objectives, and discussion questions, and (2) eight discussion groups concurrently held to study and seek suggestions and solutions for problems related to manpower for the medical laboratory.

Participants were assigned to groups related to their interests, with several disciplines represented in every discussion group. Each participant was provided a background paper containing pertinent information and outlining key questions and issues related to the discussion topic of his group.

In addition to the background papers, conference participants received resource books containing reports, tables, charts, pamphlets, article reprints, and special studies on laboratory personnel. The contents covered: Supply and Demand of Personnel, Federal Legislation, Education of Laboratory Personnel, Licensure and Certification, Health Manpower Studies. Some of the materials specially prepared for the resource book are included in the appendix to the conference proceedings.

Each discussion group had a moderator, an assistant moderator, and resource persons expert in the discussion topic. Experienced reporters were assigned to report objectively each group's deliberations and recommendations.

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January 2, 1968

In the evolution of medical laboratory practice, social, economic, scientific and technological forces are demanding the serious attention of all concerned. Medicare, Medicaid, group health practices, Regional Medical Programs, centralization of laboratories, automation and electronics in laboratory processes and an enormously increasing demand for tests and services are creating such forces today.

The responses of laboratory medicine to these forces will affect profoundly the recruitment, education and careers of laboratory personnel. To assure improvement in quality of laboratory service and patient care, as the new staffing patterns develop, all groups engaged in laboratory medicine must seek wisdom in planning and coordination in action.

This need has been impressed upon the National Committee for Careers in Medical Technology in its efforts to recruit personnel and its studies of manpower and training problems. The Cancer Control Program of the Public Health Service arrived at a similar conclusion through its support of cytotechnology training and of experiments in graduate and continuing education for medical technologists.

As a result, the National Committee contracted with the Cancer Control Program to conduct this interdisciplinary conference on Manpower for the Medical Laboratory. The conference was held October 11 through 13, 1967, at the Center for Adult Education, University of Maryland. Two hundred of the nation's leading pathologists and medical technologists, clinical chemists and microbiologists, public health and manpower specialists, occupational analysts, hospital administrators, educators and testers, scientists and economists were there.

As a next step, the Conference Planning Committee urges immediate establishment of an interdisciplinary task force to implement the conference recommendations and proposals.

Robert W Coon MD

CONFERENCE OBJECTIVES

The overall objective of the conference was to provide opportunity for members of the various disciplines concerned with training and utilization of medical laboratory personnel to (1) review some of the forces that are changing manpower requirements, and (2) explore ways of staffing medical laboratories that will serve America's health needs more effectively.

This broad directive was expressed as:

* Identifying laboratory personnel requirements as affected by changing demands of health care and distribution of services

* Analyzing the effects of technology and automation on present and future laboratory personnel needs

* Examining ways to attract, educate, train and retain qualified laboratory personnel

* Exploring career mobility and equivalency.

* Studying certification and licensure of personnel and accreditation of schools

CONFERENCE HIGHLIGHTS AND RECOMMENDATIONS

. . . A compilation based on significant statements and suggestions of conference speakers, symposium members, and discussion groups. The recommendations have been reviewed and approved by the Conference Planning Committee. Most recommendations evolved from group discussion and combined thinking and cannot be individually attributed. They are presented in the order in which conference objectives were stated, without implications of priority or urgency.

It is incumbent upon all leadership groups to make sure that you don't get stuck with the patterns that served you well in the past, but that you develop the flexibility to come out where it makes sense to come out a decade hence.

ELI GINZBERG, PH. D.

Conference participants, in the spirit of Dr. Ginzberg's challenge, sought to identify outmoded practices of the past and to formulate new patterns alined to the changes to come in laboratory staffing, personnel utilization, and standards of education and training. That such training and staffing patterns must be continuously reassessed as technological and sociological forces shape and reshape the future scene was made clear in conference speeches and discussion.

NEED FOR INFORMATION

Reflected throughout the conference was the need for a complete, detailed analysis of personnel requirements for operation of a modern clinical laboratory in terms of the functions performed and the technical and professional skills required for such performance. From this stemmed three related recommendations.

Recommendation 1: **There is urgent need for a study to determine and define skills and manpower requirements for present and future medical laboratory practice, with consideration of anticipated changes in laboratory methodology, demands for laboratory services, and organization, administration, and delivery of laboratory services.**

The study should be conducted by professional analysts. It would serve as a foundation upon which future determinations and estimates could be drawn. Activities based on other conference recommendations could be initiated concurrently with the study of job descriptions and skills.

Recommendation 2: **Findings of the study of necessary skills should be employed to reassess and realine laboratory career categories and the educational and technical levels required for the categories.**

Determination of the education, skills, and judgment required to fill medical laboratory roles is of paramount importance not only in education and training of laboratory personnel but for the nationwide recruitment efforts undertaken to meet laboratory manpower needs.

Recommendation 3: **To measure and project manpower needs accurately, a uniform laboratory workload reporting system should be formulated and adopted nationwide.**

A standardized national reporting system could be developed by coordinating the several systems presently used by professional and government organizations involved in laboratory medicine. Following development of a uniform system, the professional organizations should promote its universal adoption and use and periodic updating of its components.

EFFECTS OF AUTOMATION

Automation and computer applications in laboratory medicine are causing a technological revolution that will profoundly affect manpower requirements. The coming changes will require a high degree of competence and specialization within existing disciplines and the introduction of new disciplines to the field.

Recommendation 4: An analysis should be made of the need for new specialties and disciplines in the clinical laboratory, and of the curriculums and training to be developed to prepare personnel for the new roles.

Examples of new types of laboratory specialists that may be needed are servicemen whose military electronic experience can be adapted to use in the clinical laboratory, and systems analysts, data processing personnel, and other graduates of technical and engineering schools.

New courses for laboratory employment might include biomedical equipment operation, already the subject of pilot curriculum studies; biomedical engineering at technician and postgraduate levels; electronics; computer programing; isotope technology. Some could be taught in junior and community, as well as 4-year, colleges.

It was recommended that, in establishing new laboratory specialties, staffing patterns should be kept flexible and reviewed regularly to consider new titles, new opportunities for different types of personnel, and new responsibilities.

ATTRACTING AND RECRUITING MANPOWER

*Competition for talent has put recruitment on stage, front and center. * * * Those who are determined that the health careers shall have a fair share of the Nation's top talent will have to accept the fact that competition is a permanent part of the recruitment process, and make the most of it.*

KEVIN P. BUNNELL, ED. D.

Recommendation 5: Allied health careers should be promoted by directing information on laboratory as well as other health careers to science teachers, guidance counselors, librarians, parents, and students starting as early as upper elementary grades.

Career information should be offered as a joint exposition of the roles the various workers fill in patient care, leaving the student to decide which best matches his interest. Cooperation with health career councils can help direct attention to medical teamwork and to science courses preparatory to medical care and research. The combining of career opportunities may help offset the competition with other science fields for manpower.

Recommendation 6: Recruitment efforts should be directed to new sources of manpower.

Medical laboratory careers must appeal to a broader range of aspirations and abilities than is the case at present to meet the needs at all levels—i.e., scientists, technologists, technicians, and assistants.

It was urged that clinical laboratories recruit and welcome to their field more scientists trained in the fields of chemistry and physics. With these individuals responsible for obtaining scientific data and supervising automation, medical technologists could concentrate on areas related to patient care in which judgment provided by medical orientation is needed.

Others who with proper preparation could serve in the medical laboratory: (1) Economically and educationally underprivileged persons with ability and talent; (2) handicapped individuals whose disabilities do not preclude laboratory work; (3) inactive medical technologists; (4) married women with science backgrounds who want to enter or reenter the labor market; (5) older age groups with interest in science, including retirees with adaptable skills; (6) persons with outmoded technical skills who can be trained.

Specific efforts should be aimed at recruiting armed-service veterans who received training in military laboratory programs, as well as those with experience in electronics.

Low salaries and lack of prestige at the levels for which they qualified have deterred veterans from seeking civilian laboratory jobs. Dr. Eli Ginzberg said on this: "You must take advantage of the male manpower who have some background interest and competence in your area. That means that you must look very carefully at too rigid educational qualifications for certifications and promotions. Or you must build in an easier system for them to pick up their undergraduate degrees."

It was proposed that men leaving military service be provided with information on laboratory careers, and encouraged to use GI bill benefits to obtain the education and training that will qualify them for satisfying laboratory positions.

EDUCATION TO THINK

*If you only train somebody, he may well be left out in the cold if you introduce new procedures and new techniques * * * if, however, he has been educated to think, he has acquired certain patterns of thought, certain ways of establishing qualitative judgments, and therefore has the background to live with change and himself encourage improvement.*

CALVIN PLIMPTON, M.D.

Recommendation 7: Laboratory professionals should cooperate with educators and science education groups to help upgrade the quality of science education in elementary and high schools.

Participation by laboratory personnel in Science Fair projects is one method of offering cooperation to science teachers and of demonstrating the relationship between science courses and health careers. Other joint efforts between laboratories and educators may follow such preparation.

Students in rural and overcrowded urban schools are often barred from health careers because of poor preparation in science. Special courses could be developed to help students without adequate science backgrounds enter medical laboratory training and jobs. Such courses might be given in mobile laboratories, summer courses, and in junior colleges; as refresher programs, correspondence courses, over closed-circuit television, or as programed instruction.

A general improvement in the quality of science education might be effected by stressing its importance in the laboratory career information directed to elementary and intermediate levels, and often seen by school officials and parents.

*The community college movement is growing at a rate which is hard for most people to comprehend. As new colleges are founded, you * * * will want to assure yourselves that the health professions are adequately represented in the curricula of these institutions. More specifically, you will want to be sure that quality courses and programs supportive of the medical laboratory careers are available.*

KEVIN P. BUNNELL, ED. D.

Recommendation 8: Assistance and guidance should be provided junior colleges and vocational schools in developing educational programs leading to medical laboratory careers.

Courses of sound academic quality related to medical laboratory skills, such as general biology and applied mathematics, chemistry and physics, are needed in junior and community colleges if they are to produce medical laboratory personnel. The advantage for laboratory careers of developing courses that permit transfer of junior college credit to 4-year baccalaureate programs was stressed, as well as the importance of informing students entering terminal junior college programs of such courses' limitations in terms of future mobility.

Exactly where terminal graduates of junior and community colleges will fit in the laboratory of the future remains uncertain pending the recommended study of the knowledge and skills required for different assignments. The possibility of training these graduates specifically for general duty in small community hospitals was suggested. It was

recognized that minimal if not nonexistent supervision in such situations makes this problematical.

Dr. Ginzburg put forth the controversial proposal that science requirements for medical technology might be "squeezed into the junior college" by asking: "What part of your educational requirement is real and what part is spurious or snobbish?"

Recommendation 9: Colleges and universities should be encouraged to strengthen baccalaureate curriculums for medical technology education, and the current 3-year college plus 1-year clinical training system should be reviewed.

It was pointed out that professional personnel in medical laboratories will increasingly need education for flexibility—the ability to acquire skills not yet identified—to adjust to rapid changes in services, procedures, and skills required.

The importance of improving medical technology education in both the academic and clinical areas was stressed by Leanor Haley, Ph. D., MT(ASCP), in criticizing medical technology programs that "do not stimulate students, offer no challenge. We end up in many instances with rote workers * * * who cannot do work that we are going to have to do in the laboratory." She suggested that partial solution could come from the establishment of Colleges of Allied Health Professions, which offers "a new approach to the training of medical technologists. We get them earlier and we can set up a whole new curriculum."

Also suggested was development of core science courses for all college students preparing for health fields. This would permit joint use of faculty and laboratory facilities, strengthen recognition of the health team concept, and allow for mobility between health careers.

Development of guidelines for meaningful affiliation between colleges and universities and the clinical hospital schools affiliated with them was strongly recommended. If the clinical year of training is to be recognized by graduate schools as a bona fide college year, clinical and academic programs must be more closely coordinated to assure an educationally sound experience.

While it was recommended that teachers of laboratory personnel should devote major time to teaching responsibilities, it was felt that they should also retain some role in the laboratory to keep in touch with day-to-day activities.

Recommendation 10: Graduate education for medical laboratory personnel should be strengthened and expanded.

Increased graduate opportunities will lead to positions with greater responsibility, higher salaries, and more prestige for medical technologists, and will attract persons of higher ability and talent to the field. Graduate programs were recommended in immunochemistry, genetics, and other sciences for specialists; in administration and systems management for supervisors; in educational methodology for teachers.

Increased numbers of scholarships for graduate study by medical technologists were suggested, as was the establishment of scholarships to make it possible for a few medical technologists to attend medical school.

LEARNING TO KEEP UP TO DATE

*The essence of continuing education is helping people to grow * * * It is associated with a spirit of curiosity. It is important that the institution have this attitude of curiosity. It is typical of the attitude of good physicians, good technologists, and this attitude will be most responsible for progress in the future.*

CALVIN PLIMPTON, M.D.

Recommendation 11: Continuing education programs for medical laboratory personnel should be expanded and strengthened, and better methods for coordinating and evaluating them developed.

Continued acquisition of knowledge and expertise by laboratory personnel at all levels is essential. An inventory and clearinghouse of continuing education courses would help

coordinate them and bring them to the attention of additional personnel. Evaluation of continuing education courses should be assigned to a responsible agency.

An enlightenment program on the value of continuing education might motivate laboratory directors and hospital administrators to adjust working schedules to provide staff time for courses, thereby stimulating wider participation. Establishment of in-service programs, such as seminars, educational staff meetings, instruction on new developments and methods, during working hours, was recommended.

It was suggested that grants be made to encourage medical centers to provide postgraduate continuing education courses, including instruction on how to conduct continuing education programs that would generate satellite programs. The Public Health Service should be encouraged to augment grants-in-aid programs such as those for advanced medical technology traineeships under the Allied Health Professions Personnel Training Act administered by the Bureau of Health Manpower, and the support for graduate study initiated by the Cancer Control Program.

Members of one discussion group urged that the Bureau of Health Manpower seek the advice and assistance of the medical laboratory field in coordinating Government programs related to continuing education for this field as well as for the allied health professions in general.

Is it really necessary for teachers to mouth what has already been put into print? Attitudes are another matter. How to sterilize a syringe is different from making sure the syringe is sterilized before it is used on a patient. These simple attitudes and the more sophisticated ones can only be taught by contact with the competent instructor. GEORGE A. WOLF, M.D.

Recommendation 12: New curriculums and teaching methods should be explored, with experimentation encouraged, and self-instruction in laboratory education should be utilized more effectively.

If clinical work is to be part of the degree requirement, affiliated colleges and universities should more closely integrate academic study and clinical experience, in line with the ideas presented under recommendation 11, and the colleges and universities should take more responsibility for the total educational experience. The possibility of programing the clinical training after 4 years of college or as an integral part of the baccalaureate program was raised.

Dr. Wolf pointed out that substantive information can be learned from books, film strips, teaching machines, closed-circuit TV, and other tutorial aids. These self-education media should be exploited more fully to help students acquire information and develop skills on their own, to bring their knowledge up to the point where the skilled teacher is most effective.

A further recommendation was that outmoded rules on educational qualifications be modernized, rigid reliance on clock hours or course units being replaced with more effective mechanisms for demonstrating competence. Creation of more flexible examining systems might increase experimentation and progress in education and training.

MOBILITY AND MANPOWER

*Wherever we have a profession with a compensation structure which is rigid * * * where there is no place to go at the top, recruitment of talented individuals will be difficult.*

E. R. JENNINGS, M.D.

Recommendation 13: Career opportunities in medical laboratories should be improved, and financial rewards provided at the top that will attract and retain more professional administrators and other specialists.

Low salaries are a major recruitment deterrent. They tend also to make for a predominantly female work force, a situation Dr. Ginzberg called unhealthy in its effects on career continuity and its drag on wage rates.

Entering salaries should be at least comparable with those of other professions requir-

ing similar education and proficiency. Salary schedules should offer a series of levels based on competence and responsibility that enable qualified technologists to move into supervisory and administrative positions up to a suggested position of assistant clinical director. There should be a reasonable number of positions at the level of $15,000 and above.

Efforts should be made to insure effective utilization of laboratory personnel and adequate opportunities for advancement. Personnel trained and employed below their capabilities should be able to obtain education or training leading to higher positions without starting in again at the bottom of the academic ladder. Educational programs should be designed so that students who do not want to stop at given points in the career ladder, may use one program as a steppingstone to the next.

Ladders of opportunity are especially important for minority groups, it was emphasized by Montague Brown, as "these are the groups who can least afford to be boxed in. They are less likely to be able to get back into school and go up a ladder outside the job structure."

Recommendation 14: Representatives of medical laboratory disciplines should initiate efforts with educational testing specialists to develop equivalency tests to provide increased mobility between levels and categories of laboratory careers.

Equivalency tests would make it possible for individuals to obtain science credits needed for advancement through recognition of self-study, experience, maturity, and skills gained on the job. Construction of adequate equivalency testing instruments would be facilitated by the basic study defining essential skills for the categories of laboratory employment. Methods developed to equate experience with education and training can be used to evaluate correspondence, television, and continuing education courses as well as to enable graduates of Armed Forces laboratory programs to enter college or medical technology training without meeting traditional academic requirements.

Efforts should be made to insure recognition of equivalency tests by boards of certifying and licensing laboratory personnel, and for admission to and advanced standing in colleges and universities.

Development of equivalency tests would enhance the appeal of laboratory careers. The recognition of knowledge gained outside of formal education to fulfill academic and clinical requirements would give persons with initiative and ability opportunities for advancement.

LICENSURE, CERTIFICATION, ACCREDITATION

What you must decide is whether you prefer State or Federal controls, because some kinds of controls obviously have to come. The question is simply, what system of control makes sense?

ELI GINZBERG, PH. D.

Recommendation 15: The agency administering a licensing program for clinical laboratory personnel should have an advisory board of representatives of the scientific disciplines involved as well as knowledgeable representatives of the public.

Professions affected by laws and regulations should actively participate in their development. Anticipating licensing legislation, the professional societies and academic institutions involved in the training of medical laboratory personnel and the State health departments should seek closer cooperation and communication in order to better identify and assess each other's views.

It was suggested that State laws adopt, as qualifications for licensure, standards established by national medical and scientific organizations such as the standards used by the AMA's Council on Medical Education in approving AMA-accredited schools of medical technology. Standards should be flexible to keep pace with changing technology.

Licensure should apply primarily to individuals responsible for performing tests and arriving at results requiring scientific judgment. Accordingly, only the professional staff of medical technologists, laboratory scientists, and supervisory personnel should be included. In furtherance of the primary objective of certification and accreditation—to maintain and

improve quality—emphasis should be on qualifying rather than disqualifying programs and persons.

Recommendation 16: Accrediting and certifying agencies should explore possibilities and ways of offering their services to all schools requesting evaluation, and to graduates of non-accredited programs applying for certification.

Accreditation of schools serves the objectives of identifying qualified schools for the public and the profession, stimulating the development of good educational standards, and providing a guideline for licensure requirements. Establishment of a universal accreditation agency for all schools and personnel desiring evaluation would facilitate achievement of these objectives and eliminate confusion caused by multiple registries and accrediting groups.

REPORT OF THE CONFERENCE

EXCERPTS FROM SPEECHES

Opening the conference, Donald R. Chadwick, M.D., USPHS Assistant Surgeon General, and Director of the National Center for Chronic Disease Control, observed that control of chronic diseases depends to a very large extent on excellence in laboratory services, which in turn depends on finding answers to the problems confronting the conference. These problems center on the training and utilization of people who can work in medical laboratories.

Following Dr. Chadwick, Kevin P. Bunnell, Ed. D., associate director of the Western Interstate Commission for Higher Education, urged the addition of new dimensions to medical laboratory recruitment programs. Pointing out that the laboratory profession is "in the midst of a technological and scientific revolution over which it will have comparatively little control—but which could radically change" it, he suggested that recruitment aim not only at new young students but at older aged groups, at persons with outmoded technical skills, and at a broad manpower base not confined merely to the "intellectually gifted."

Dr. Bunnell noted the failure to use womanpower to its fullest advantage, and advocated new kinds of education programs and appeals to "accommodate the life patterns of married women." He spoke of relevance as the key word in all of education. The real challenge, he charged, "is to see that the whole process from preprofessional training through continuing education, including recruitment and the practice of the profession itself—that the whole process remains relevant to the changing world as it is continuously revealed to us."

Leonard D. Fenninger, M.D., Director of the USPHS Bureau of Health Manpower, opened the Thursday sessions with definition and interpretation of the five conference objectives. He suggested that the estimated error of 25 percent in laboratory determinations performed in the United States comes from laboratories that are "overloaded, understaffed, or where personnel are inadequately prepared for the new determinations that laboratories are being called upon to make." More successful recruiting, training, and utilization of laboratory personnel he called "essential for the improvement of patient safety and patient care."

In his address, Eli Ginzberg, Ph. D., Director, Conservation of Human Resources, Columbia University, urged conference participants to make sure that in reaching conclusions, "you don't get stuck with the patterns that served you well in the past, but develop the flexibility to come out where it makes sense to come out a decade hence." Sounding an optimistic note, Dr. Ginzberg stated that "automation is going to redound to your benefit. The large medical institutions and hospitals of the future will assist the economics and efficiencies of laboratories." They will also present a paradox in that, according to manpower economists, skills ought to be greatest where the workload is greatest, as in large laboratories, he noted. However, in the medical field, technologist skill in a small laboratory must be high to respond to the wide range of clinical testing required.

On the preponderance of women in medical laboratory employment, Dr. Ginzberg said, "It is not healthy for a field if 85 percent of its personnel are women." He pointed to the compressed salary range of about $6,000 to $7,500 which "is not sufficient for a man who has a family," and recommended restructuring the field to create a reasonable number of assignments and career opportunities paying $15,000 and more.

Other suggestions made by Dr. Ginzberg were: Recruit young men with medical laboratory training who leave the armed services, possibly by more flexible certification and promotion procedures or by making it easier for them to obtain prerequisite academic credits; greatly expand career ladders in medical laboratories; establish a laboratory position of rank of assistant clinical director paying $15,000 to $18,000 to relieve overburdened directors of laboratories too big and complex to be supervised without such help; direct recruiting efforts to the junior colleges, which he called "the fastest growing dimension of higher education in the United States," and to college-trained "mature women of 32 or older" whose children have entered school; provide scholarships to permit ambitious young medical technologists to attend medical school to become physicians.

Dr. Ginzberg concluded: "To get clinical laboratories properly staffed, properly supervised, properly managed is a problem. But I think it can be done. The big challenge you face * * * the fact that the whole of American medical care, the whole system, is now wide open. Everything is in movement."

Ivan L. Bennett, Jr., M.D., Deputy Director of the Office of Science and Technology, Executive Office of the President, predicted major changes in future laboratory technology on the basis that "generally speaking, predictions about future technological developments, no matter how fan-

Dr. Wolf applauded the "desire to get together in the health field" by such organizations as the Association of American Medical Colleges and the American Medical Association. In conclusion he pointed out that, "changing educational patterns are not necessarily new techniques of education, but better application of existing techniques. There are no new, easy gimmicks to help us. We must revise our educational objectives and take a fresh look at how to achieve them."

tastic they may have sounded when first uttered, have fallen short of the fantastic reality that has come into being by the time the future has finally become the present." He warned that "the principal danger in the selection of goals for the future lies in the powerful and diverting temptation to indulge in * * * self-fulfilling prophecies," particularly if the prophecy does not conform with the best attainable goals.

Dr. Bennett attacked fears about the possible takeover of laboratory medicine by "conglomerate corporations otherwise unrelated to health care" as a question that should not "influence decisions about how the medical laboratory can more effectively serve America's health needs," because it concerns possible consequences, not purposes. In conclusion, Dr. Bennett urged conference participants to be "tough but flexible, to put some resilient steel into your conclusions and recommendations."

Closer regard must be directed to the public's future health needs, stated George A. Wolf, M.D., provost and dean, University of Kansas School of Medicine, if for no other reason than that the public, through government, now provides majority support for higher education. "Freedom to do the job our own way can be lost if we do not produce the trained people the public expects," he said. Dr. Wolf's suggested changes in present educational practices included: (1) Health careers recruitment that is an educational function, not a sales job. "Recruitment should be an exposition of the roles which the various workers play in caring for the patient, leaving the student to decide which role he wants to play." (2) A core health educational curriculum providing "the sound base from which the student can step into advanced educational programs for one of the health professions" and move sideward or upward as the student desires. (3) Improvement in teaching students not only health care skills, but substantive information and attitudes. He suggested exploration of self-teaching devices—books, film strips, teaching machines, closed-circuit TV—as means of saving valuable teaching time to communicate attitudes rather than techniques. "How to sterilize a syringe is different from making sure the syringe is sterilized before it is used on a patient," he commented.

EXCERPTS FROM SYMPOSIUM

A panel of seven experts representing aspects of administration and utilization of laboratory medicine addressed themselves to and answered questions from the audience on manpower for the medical laboratory and the eight related topics assigned to discussion groups. Calvin Plimpton, M.D., president of Amherst College, moderated and spoke for education.

Noting that "science is moving along," Dr. Plimpton named educating students to think as the surest method of providing them career mobility. Training students to do something one way or to execute a procedure may suddenly become irrelevant due to scientific changes, he explained, adding, "If on the other hand you have trained them to think, if you have really provided them with an education, they can move from one procedure to another and even from one profession to another * * * Hence I am making a plea for education, not just about a particular subject, but education for life as well."

Speaking of continuing ongoing education, he called it a "spirit quickening" that is the essence of helping people to grow while continuing to stay young. Commenting on automation, he applauded its accuracy over manual methods of quantitative measurement, the relief it affords employees from dull routine, and the fact that it makes work "lively and frees people to be human beings."

Comments of E. R. Jennings, M.D., director of the pathology laboratory, Memorial Hospital of Long Beach, Calif., were concerned with automation and licensing. Dr. Jennings expressed the opinion that "automation will create a need for medical technologists to be teachers and supervisors, to be better trained, to troubleshoot complex equipment," rather than simply to do tests as they have in the past. But, he added, "not all our problems will be solved with autoanalyzers, robot chemists, and computers."

One need that must be met, Dr. Jennings said, is that demonstrated in rural areas for extremely competent, well-versed, general-duty medical technologists. Other coming developments he mentioned were intensive, bedside care requiring a medical technologist in attendance 24 hours a day for the critically ill, and centralized, regional laboratories for preventive medicine, including detection of latent disease in apparently well people. Speaking of licensure, he offered the opinion that "generally it has been a very good influence on laboratory medicine" in California but that it has brought a certain amount of rigidity that is an impediment.

Leanor Haley, Ph. D., MT(ASCP), director, microbiology department, State University Hospital, Brooklyn, N.Y., representing medical technology on the panel, agreed with Dr. Jennings that "the rote worker cannot do the work we are going to have to do in the laboratory." She criticized the present baccalaureate degree in medical technology as in many instances producing rote workers. She called it "not really an academic degree, rarely recognized by any graduate school of reputable standing, and one of the reasons we lose people in the field" because it does not stimulate or challenge students. She approved the establishment of Colleges for Allied Health Professions, and expressed the hope that new experimental programs will emerge "because the medical technologist does not come to us with a strong enough background to set up many of the new procedures and carry out many of the teaching and supervisory responsibilities that exist in the laboratory."

Ralph E. Thiers, Ph. D., director of clinical chemistry at Duke University Medical Center, representing clinical chemistry, divided laboratory medicine into two distinct parts—60 to 70 percent quantitative in nature, the other part qualitative, requiring judgment and educated experience. The impressive advances in laboratory medicine have been in the quantitative aspects, he said, but have not made substantial inroads on the subjective, qualitative work of laboratories.

The central and regional laboratories predicted for the future have proved best suited to quantitative laboratory tasks, Dr. Thiers stated. He added that increases in this type of laboratory structure will siphon off more technologists into the quantitative areas and create even more acute shortages of personnel to do the qualitative work.

He suggested as an approach to the solution of this problem the recruitment of chemists and other scientists interested in "improving the analytical results from quantitative instruments and methods," rather than in patient-related activities. He added that "these scientists are almost wholly unaware that they are needed in the clinical laboratory," and should be made to feel welcome.

Dr. Thiers recommended reappraisal of present training programs in light of automation advances to ensure that the people who put the samples in the equipment receive appropriate training, and those who do the supervision are properly trained to supervise.

Speaking as a health planner, Stanley Olson, M.D., director, Tennessee mid-South regional medical program, explained the primary goal of regional medical programs as improving patient care in heart disease, cancer, and stroke. To the question of how leverage can be exerted to effect such improvement, Dr. Olson stated that the programs will promote cooperation between educational institutions and the community institutions where care is given, so that the two can more effectively serve the physicians' and the public's needs. The programs will also provide funds for research in educational procedures and in patient care, and will evaluate all projects to determine whether in fact patient care is improved.

Representing a physician user of laboratory services, Bland Cannon, M.D., member of the American Medical Association's Council on Medical Education and its Committee on Allied Health Professions and Services, said that physicians want "instant" and "accurate" laboratory service. This requires competent laboratory personnel and, to assure it, continuing education, reassessment, reevaluation, and recertification. He pointed out that the health industry has been creative in developing new technological advances, but slow to use them widely. Now, he said, "a change has started through automation procedures and multiphasic screening."

As a "community user of laboratory services," George James, M.D., dean of New York City's Mount Sinai School of Medicine, recommended that laboratory services be more concerned with what people need than what they ask for at the moment. "If you realize that our major hope for the future is to pick up conditions when they are still at the risk or early presymptomatic stage, you will see that there is much work in your future in gearing your services to meet these needs, both in research and in service." He deplored the seeming emphasis, at present, on quantity in laboratory procedures over quality.

Speaking for hospital administration, Montague Brown, director, Hospital Research Education Trust of New Jersey, noted that hospital administration personnel are moving into management positions in clinical laboratories, and said that medical technologists may have to pursue higher degrees in management. He foresaw the development of large-scale organizations for laboratory work as well as for other services delivered to community hospitals, and in this connection expressed concern for rural areas where highly qualified general-duty personnel are needed. He mentioned the hope that the type of people who like to run a country-store type of operation may fill this manpower need. Making a plea for more effective career ladders in clinical laboratories, Mr. Brown called for special efforts for minority groups who usually start at the lowest level of laboratory jobs, and are the ones "who can least afford to be boxed in" because of lack of educational opportunities.

THE DISCUSSION GROUPS

Conference participants were divided into eight separate groups for afternoon and morning sessions on eight questions related to manpower for the medical laboratory. Because of the interrelationship between the questions, discussion frequently ranged across borderlines from assigned topics to related ones. Some of the following brief, condensed reports reflect multigroup discussion.

On the topic, "Needs and Potential Sources for Laboratory Personnel," it was concluded that while future personnel needs cannot be accurately projected, it is probable that twice as many laboratory workers as are now employed will be needed in a decade. The two principal levels of need, the discussion group felt, will be for highly trained specialists to do complex tasks and for subbaccalaureate personnel to do large-volume testing, generally automated. Obtaining this personnel will require intensified recruitment efforts directed to students at all levels, to personnel leaving military service, married women seeking to return to work, the disadvantaged, and to the parents, teachers, counselors, and others who influence choices of careers.

Discussing "The Impact of Automation and Other Advances on Technology and Science," participants agreed that laboratories today are only on the threshold of automation and computerization. More advanced application awaits availability of more computer and other specialists. Just as present laboratory personnel has been able to adjust to the current rate of automation, so will future laboratory employees adapt to future changes, perhaps with the help of stronger science and specialized courses. It was thought that general-duty, nonspecialist personnel at baccalaureate and at subbaccalaureate levels will continue to be needed both for small, nonautomated laboratories and as manpower pools from which specialists will be recruited. Continuing education and retraining courses will be essential to the introduction and use of technological advances.

It is not possible at present to objectively evaluate "The Role of Continuing Education in Keeping Laboratory Workers up to Date," it was felt, because of the lack of accurate evaluation techniques. Participation in continuing education could be increased by establishment of continuing education programs in laboratories, improvement in present continuing education offerings, rewarding enrollment by salary and other benefits, and enlightening laboratory directors and administrators on the values of continuing education.

The conclusions reached on "Mobility Through Equivalency and/or Education" were that mobility between the levels of medical laboratory personnel can and should be increased. Means suggested for bringing this about were development of strong, basic, health care courses for the various laboratory careers, improvement of laboratory education and training across-the-board, and development of methods of measuring and giving equivalent credit for experience and training. It was pointed out that instruments to measure equivalency would require, first, detailed analysis of laboratory job requirements and, second, extensive developmental efforts by testing and laboratory experts working closely together.

It was concluded by those discussing "Certification and Licensure of Medical Laboratory Personnel and Accreditation of Schools," that while both licensure and certification (the latter defined as voluntary registration) are desirable and meet different needs, neither can guarantee high per-

formance. However, licensure if based on sound law effectively enforced and assisted by advisers representing both the disciplines involved and the public, can come nearer to maintaining standards than can voluntary programs. Most believed that licensing should be confined to the medical technologist and other professional and supervisory categories. Although formal education was judged the surest means of assuring quality performance, it was agreed that other qualifications could also serve as criteria. The possibility was suggested of having the established accrediting agencies offer their services to all schools submitting programs for evaluation, rather than only to those conforming to certain stipulations, as a way of eliminating public confusion over self-ordained registeries.

Discussion on "The Effects of Central, Regional, and Other Emerging Laboratory Structure Patterns on Education, Training, and Utilization of Medical Laboratory Personnel" reached agreement that most future job opportunities are likely to be in (1) centralized, (2) regional, (3) reference, (4) small local laboratories, (5) intensive care or accident facilities. It was concluded that top laboratory positions will require increased competence as gained in advanced courses in automation and technology and in master's degree programs. There will still be need for generalists, particularly in small laboratories, and for post-high-school personnel as in operation and maintenance of equipment. The group held the opinion that automation is likely to improve opportunities for advancement and diversification at the top levels but to reduce mobility for those at lower levels. It was felt that increased use of automation would produce more income which in turn would increase remuneration for personnel, which would have the effect of attracting more men to the field.

Those considering "Strengthening the Education and Training of Laboratory Personnel," concurred that education of laboratory personnel should be centered in institutions of higher learning, leaving to the clinical laboratories the provision of clinical experience for students in academic programs, as well as on-the-job training of their own personnel. Two-year colleges were named as educational institutions of great potential influence and the importance of working with them to devise acceptable programs was stressed. In this connection, facilitating transfer of academic credits from junior colleges to baccalaureate, as well as from baccalaureate to graduate programs, was advised.

It was suggested that medical technologists should have strong 4-year baccalaureate education followed by or integrated with hospital internships, possibly of only 3 to 6 months; that the Board of Schools consider abolishing clock-hour requirements and substituting other measures of competency; that development of a common-core curriculum for students in health fields be explored; that teachers of laboratory personnel be given proper training and ample time to fulfill their teaching responsibilities.

In regard to "The Influence of Sociological and Economic Factors in Choosing Medical Laboratory Careers," sociological factors that influence career choice were named as the individual's school environment, peer influence, and parental attitudes. Work conditions, the public image of the medical technologist, and the career itself were also judged influential. Economic considerations believed important were opportunity, individual recognition, competent leadership, salary, and professionalism defined as a desire to be of service. It was suggested that opportunities for growth and advancement are of equal or more importance than salaries, and that both beginning and ceiling salaries should be of a level to attract both men and women to the field for lifetime careers.

THE CONGRESSMAN'S REMARKS

In a dinner address on health legislation and its effects on medical laboratory manpower, Congressman Paul G. Rogers of Florida characterized the conference as having "a problem of three dimensions—producing more manpower to fill the already existing manpower gap, establishing a program for increasing this number as technology requires more manpower, and developing a system of retraining those we have to match the ever-changing technology of the laboratory and medicine."

He added, "I commend you for this meeting. I sincerely hope there will be other such meetings where men of different disciplines will meet to discuss the problems common to the entire spectrum of the profession."

The Congressman effectively summarized both the problems posed for the conference and the objectives envisioned for it.

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