Meetings

Weights and Measures

Major decisions affecting international cooperation in science were reached during the 52nd meeting of the International Committee of Weights and Measures, held in Paris in October 1963. These decisions, if implemented, will result in a very substantial increase in the activities of the oldest intergovernmental scientific laboratory.

The International Committee of Weights and Measures supervises the work of the International Bureau of Weights and Measures, which originated with the Treaty of the Meter of 1875. This organization, which is supported by 39 governments, provides the basis for assuring uniformity of physical measurement throughout the world, including the improvement and extension of the metric system. The participating governments control this activity through a General Conference of Weights and Measures, which meets normally at 6-year intervals. The International Committee is appointed by the General Conference to supervise the scientific activities on a continuing basis.

The International Committee concluded at its recent sessions that 6-year meetings were too infrequent and has ordered the 12th General Conference of Weights and Measures, originally scheduled for 1966, to be convened in October of 1964. At this conference the participating governments will be requested to double the regular budget of the International Bureau of Weights and Measures, going from the present level of $300,000 per year to $600,000. (The United States is assessed 10 percent of the total budget.) The governments will also be asked to make an extra contribution of $300,000 to equip a new laboratory now under construction on the Bureau's site in Sèvres, just outside of Paris. This laboratory was authorized by the 11th General Conference of Weights and Measures (1960) and is intended to provide the international center for the coordination of standards for measuring ionizing radiations.

The increased operating budget, if approved, will permit attention by the staff of the International Bureau to modern problems in metrology, including such things as improvement and extension of the temperature scale and the realization of the full potential afforded by the wavelength definition of the meter which was agreed upon by the 11th General Conference.

In recognition of the growing importance of precision measurements at very high radio frequencies, the Committee established a special task force to study the possible need for a program in this area at the International Bureau. Increased international trade in radio frequency instruments, the growing importance of physical constants measured at radio frequencies, and the prospect of international cooperation in space and satellite programs are factors requiring a greatly increased and continuing effort to assure the international compatibility of measurements at radio frequencies.

The Committee set in motion procedures which may lead to the redefinition of the second in terms of an atomic constant at the October 1964 General Conference. A group of specialists meeting as the Consultative Committee for the Definition of the Second in Paris in December 1963 reached agreement on a specific value for the cesium resonance and on alternative procedures for using this value as a basis for redefining the unit of time. These alternative procedures are now being considered by the International Committee through correspondence. If agreement is reached upon a definite procedure the Committee's conclusion will be presented to the General Conference in 1964. Previously it had been expected that agreement on an atomic definition of the second would not be reached before 1966.

The International Committee agreed to recommend a redefinition of the liter which had been formally defined in 1901 in terms of the volume occupied by a kilogram of water. It was intended that the liter would be identical in value to the cubic decimeter. It is now known that the two volumes differ by 28 parts in a million and this discrepancy is frequently a cause of difficulty in precision measurements. The Committee will recommend to the General Conference that the old definition of the liter be abandoned and that the liter be recognized as a special name for the cubic decimeter.

Acting upon the recommendation of its Consultative Committee for the Definition of the Meter, the Committee adopted standard values of a number of atomic energy transitions as secondary length standards. The meter is now defined in terms of the $2P_{10}$ $5d_5$ transition of krypton-86. Among the secondary standards approved were four additional transitions in krypton-86, four transitions in mercury-198, and four in cadmium-114.

Acting upon the recommendation of its Consultative Committee on Standards for Measuring Ionizing Radiations, the Committee agreed to recognize the curie, with the symbol Ci, as a special unit of activity equal to 3.7×10^{10} disintegrations per second. The new symbol differs from common usage but is consistent with the standard symbol of the International Council of Scientific Unions and also of the International System of Units which is the responsibility of the International Committee of Weights and Measures. The Committee also agreed to recognize the roentgen, designated by the symbol R, as a special unit for radiation dose.

The International Committee approved several programs involving the international exchange of instruments and materials as a means of promoting uniformity of measurement. These programs were based upon recommendations of several Consultative Committees and include the distribution of electrical instruments and standards, standard thermometers, standard light sources, standard radio nuclides, and standard x-ray ionization chambers.

As a means of promoting increased international communication and understanding in the science of physical measurement, the Committee agreed to sponsor an international journal to be called *Metrologia*. It is expected that the new journal, which will receive edi-

torial guidance from the International Committee, will be privately published. A formal announcement with specific details will probably be made within the next few months. The new journal will include articles describing original research in various fields of precision measurements and the development of associated standards. In addition, review articles in various branches of metrology will be featured. The journal will publish articles in the language in which they are submitted by the author.

The International Committee consists of 18 members and is chaired by Richard Vieweg, former President of the Physikalisch Technische Bundesanstalt, Braunschweig, Germany. Vice chairman of the Committee is Leslie Howlett, director of the Division of Applied Physics, National Research Council, Ottawa, Canada, and the secretary is J. de Boer, professor of physics at the Institute for Theoretical Physics, University of Amsterdam, The Netherlands. The U.S. member of the committee is A. V. Astin, director of the National Bureau of Standards.

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Human Diploid Cell Strains

A symposium on the characterization and uses of human diploid cell strains was held in Opatija, Yugoslavia, 24–26 September 1963. There were 96 delegates from 18 countries. The sessions covered management of human diploid cell strains; biochemical, cytogenetic, and immunological studies on human diploid cells; virus spectrum of human diploid cells; production of human virus vaccines in human diploid cell strains; and results of clinical trials on the use of vaccines prepared in these cell strains.

Many laboratories receiving the cell strains reported success in propagating them and attributed most of the early failures in handling these strains to variations in media constituents.

The cells showed the classic normal human diploid karyotype until approximately the 40th cell generation. It was reported that, at least for some loci, cultured diploid cells carry and express the genes of their donor. The cell strains retain the donor's chromosomal complement and they also maintain biochemical and immunological properties of the donor cells. In a sense these observations are complementary since they indicate, at two structural levels, an apparent genetic resemblance between the cultured cells and the somatic tissues of the host.

Numerous attempts to isolate latent viruses from these cells have been unsuccessful. Dangers from extraneous oncogenic viruses, inherent in the use of primary explants of animal tissue, are largely circumvented, in the opinion of many workers, when diploid cell strains are used to produce vaccine.

Studies of the virus spectrum of human diploid cell strains indicated that they were susceptible to many viruses. These strains were considered valuable in work with the rhinoviruses that cannot generally be detected in other cell substrates. Since different cell strains vary in their sensitivity to rhinoviruses, it was felt important to use the most sensitive strains.

Both live-attenuated and killed vaccines for parenteral inoculation or oral administration have been made in these cell strains from poliovirus, rhinovirus, adenovirus, varicella, measles, vaccinia, and rabies. After adapting to the cell strains, the viruses investigated gave yields equal to those in other cell systems. Studies with polioviruses showed that they retained their genetic markers when propagated in the human cell strains.

It was urged that all laboratories using these cell strains for producing vaccine limit themselves to a few standardized strains. The use of a well-characterized tissue-culture system is as logical and necessary as the use of a well-characterized virus to be propagated in this system.

Clinical studies on a number of virus vaccines are in progress. It was reported that an oral poliomyelitis vaccine produced in human diploid cell strains has already been successfully tested in a large-scale field trial and that no untoward reactions have been noted in 7000 subjects who have received vaccine during the past 2 years. It was also reported that such vaccines proliferated in the gastrointestinal tract and elicited an antibody response.

On the basis of studies on the feasibility of large-scale production of virus vaccines in these cell strains, a subcommittee of the conference drafted "Minimum Requirements for Human Diploid Cell Strains To Be Used in Vaccine Preparation." These requirements were presented to the participants and adopted at a plenary session.

This symposium was sponsored by the Permanent Section on Microbiological Standardization of the International Association of Microbiological Societies.

Leonard Hayflick
Wistar Institute of Anatomy and Biology, Philadelphia, Pennsylvania
Frank Perkins
Medical Research Council, National Institute for Medical Research, London, England
Robert E. Stevenson
National Cancer Institute, National Institutes of Health, Bethesda, Maryland

Forthcoming Events

March

2–4. Fundamental **Cancer Research**, 18th annual symp., Houston, Tex. (R. J. Shalek, Dept. of Physics, Univ. of Texas, Houston)

2–6. **Analytical Chemistry** and Applied Spectroscopy, Pittsburgh, Pa. (R. B. Fricioni, Allegheny Ludlum Steel Corp., Research Center, Brackenridge, Pa.)

2–6. Applied **Meteorology**, 5th conf., American Meteorological Soc., Atlantic City, N.J. (A. Hilsenrod, Federal Aviation Agency, Atlantic City)

3–7. Inter-American **Nuclear Energy** Commission, 5th, Valparaiso, Chile.) Pan American Union, Constitution Ave., NW, Washington, D.C. 20006)

3–21. World **Health** Assembly, 17th annual, Geneva, Switzerland. (WHO, Palais des Nations, Geneva)

4–6. **Thermal Radiation** of Solids, symp., San Francisco, Calif. (W. D. Harris, Engineering and Sciences Extension, Univ. of California, Berkeley 4)

4–7. **Psychoanalysis**, first Pan-American congr., Mexico City, Mexico. (The Congress, Insurgentes 421 "C"-108, Mexico 11, D.F.)

5–6. Theoretical and Applied **Mechanics**, southeastern meeting, Atlanta, Ga. (Dept. of Short Courses and Conferences, Georgia Inst. of Technology, Atlanta)

5–7. Evaluation and Mechanisms of **Drug Toxicity**, conf., New York, N.Y. (New York Acad. of Sciences, 2 E. 63 St., New York 21)

5–7. **Macromolecular** Colloquium, Freiburg im Breisgau, Germany. (Institut für Makromolekulare Chemie, Univ. Freiburg, Stefan-Meier-Str. 31, 78 Freiburg im Breisgau)

5–7. Pacific **Sociological** Assoc., Coronado, Calif. (S. M. Dornbusch, Stanford Univ., Stanford, Calif.)

6–8. Society of **Nuclear Medicine**, southwestern chapter, Houston, Tex. (S. N. Turiel, SNM, 333 North Michigan Ave., Chicago 1, Ill.)

6–8. National **Wildlife** Federation, 28th annual, Las Vegas, Nev. (NWF, 1412 16th St., NW, Washington, D.C. 20036)

7–12. **Proctology**, 16th teaching seminar, Miami Beach, Fla. (J. Reichert, 147-41 Sanford Ave., Flushing, N.Y. 11355)