

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.

A. V. ASTIN
*National Bureau of Standards,
Washington, D.C. 20234*

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 prop-

erties 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)

3-27. 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)

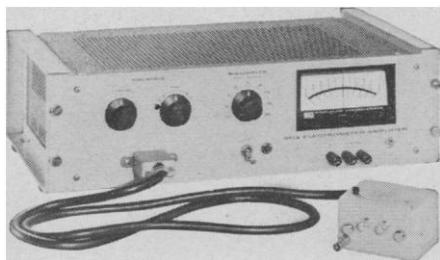
5-7. Pacific **Sociological** Assoc., Coronado, Calif. (S. M. Dornbusch, Stanford Univ., Stanford, Calif.)

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)

a differential input electrometer amplifier



KEITHLEY 603

10¹⁴ ohms input resistance
broad bandwidth

A useful tool for measuring high impedance voltages and low currents. In current measurements, the Model 603 is extremely fast and has the ability to measure small difference currents. Keithley provides matched sets of shunting resistors for rapid insertion in the input head.

Applications include micro-electrode measurements, pH determinations, and use of pulse techniques to measure solution conductivity or sweep times of minority carriers in semi-conductors. Also useful in studies of piezo-electrics, in measuring photo cell currents, and ion currents in mass spectrometry.

Separable input head permits remote measurements up to 24 feet from the amplifier. Placing the input head close to the signal source simplifies connection and shielding problems, reduces the effective capacitance and increases measuring speed.

- **voltage ranges** from 2.5 mv to 1000 mv in 1x and 3x steps.
- **input impedance** over 10¹⁴ ohms, 10 μ f.
- **bandwidth** to 10 kc on the 2.5 mv range, rising to 50 kc on the 1000 mv range.
- **zero drift** less than 2 mv per hour decreasing to about 0.5 mv per hour after 3 hours.
- **noise** less than 35 μ v rms at full bandwidth.
- **zero suppression** up to one volt.
- **exact gains** of 4000, 2000, 1000, 400, 200, 100, 40, 20 and 10.
- **accuracy** within 2% fs on all ranges.
- **price \$750.00**



Send for latest catalog

**KEITHLEY
INSTRUMENTS**

12415 Euclid Avenue • Cleveland 6, Ohio

8-12. **Water Resources Engineering**, conf., Mobile, Ala. (American Soc. of Civil Engineers, 345 E. 47 St., New York 10017)

8-15. **North American Clinical Dermatologic Soc.**, Mexico City, Mexico. (E. F. Finnerty, 510 Commonwealth Ave., Boston, Mass.)

9-10. **Aerodynamic Testing Conf.**, American Inst. of Aeronautics and Astronautics, Washington, D.C. (J. N. Fresh, David Taylor Model Basin, Code 630, U.S. Navy, Washington, D.C.)

9-11. **Computers in Education**, conf., Eugene, Ore. (J. W. Loughary, School of Education, Univ. of Oregon, Eugene)

9-11. **North American Wildlife and Natural Resources conf.**, Las Vegas, Nev. (Wildlife Management Inst., 709 Wire Bldg., Washington 5)

9-11. **Society of Toxicology**, annual, Williamsburg, Va. (C. S. Weil, Mellon Inst., 4400 Fifth Ave., Pittsburgh, Pa. 15213)

9-13. **National Assoc. of Corrosion Engineers**, 20th conf., Chicago, Ill. (W. H. Schultz, Dearborn Chemical Corp., Chicago, Ill.)

9-13. **Peaceful Applications of Nuclear Energy**, 5th inter-American symp., Valparaiso, Chile. (J. D. Perkinson, Inter-American Nuclear Energy Commission, Pan American Union, Washington, D.C.)

10. **Wildlife Telemetry**, annual, Las Vegas, Nev. (L. Adams, Univ. of California, Carmel Valley)

10-12. **Exploding Conductor Phenomena**, 3rd conf., Boston, Mass. (W. G. Chace, Air Force Cambridge Research Laboratories, Hanscom Field, Bedford, Mass.)

10-13. **Raman Colloquium**, Freudenstadt/Schwarzwald, Germany. (J. Gobeau, Dept. of Chemistry, Technische Hochschule Stuttgart, 7 Stuttgart, Germany)

10-14. **American Inst. of Chemical Engineers**, New Orleans, La. (AIChE, 345 E. 47 St., New York 17)

11-12. **Instrument Soc. of America**, 14th conf. on **Instrumentation** for the iron and steel industry, Pittsburgh, Pa. (N. F. Simcic, Research Laboratory, Jones and Laughlin Steel Corp., 900 Agnew Rd., Pittsburgh 30)

12. **Interplanetary Monitoring Platform Experiments**, symp., Greenbelt, Md. (C. P. Boyle, Code 207, Goddard Space Flight Center, Greenbelt, Md. 20771)

12-13. **Information Organization**, New Brunswick, N.J. (S. Artandi, Graduate School of Library Service, Rutgers Univ., New Brunswick)

13-14. **Louisiana Acad. of Sciences**, Baton Rouge. (H. J. Bennett, Dept. of Zoology, Louisiana State Univ., Baton Rouge)

13-14. **Institute of Management Sciences**. 11th intern., Pittsburgh, Pa. (IMS, Box 273, Pleasantville, N.Y.)

13-14. **Effects of Shock and Vibration** on the human body, Denver, Colo. (A. E. Paige, Dept. of Electrical Engineering, University of Denver, Denver)

14-15. **Endocrinology**, 2nd annual symp., Salisbury, N.C. (H. Nushan, Medical Service, Veterans Administration Hospital, Salisbury)

14-19. **American Assoc. of Psychiatric Clinics for Children**, annual, Chicago, Ill.

(AAPCC, 250 W. 57 St., New York 19)

15-19. **Microcirculation**, 3rd European conf., Jerusalem, Israel. (E. Davis, Capillary Research Laboratory, Hadassah Univ. Hospital, P.O. Box 499, Jerusalem)

15-21. **American Soc. of Photogrammetry**, congr. on surveying and mapping, Washington, D.C. (American Soc. of Photogrammetry, 44 Leesburg Pike, Falls Church, Va.)

17-18. **Hypervelocity Flight Techniques**, symp., Denver, Colo. (W. G. Howell Denver Research Inst., Univ. of Denver, Denver, Colo. 80210)

17-19. **Society for Nondestructive Testing**, Los Angeles, Calif. (D. E. O'Halloran, Northrop Corp., 1001 E. Broadway, Hawthorne, Calif.)

17-19. **Statistical Assoc. Methods for Mechanized Documentation**, symp., Washington, D.C. (M. E. Stevens, Natl. Bureau of Standards, Washington, D.C. 20234)

17-20. **Society of Biological Chemistry**, Paris, France. (P. Malangeau, Executive Committee, 4, Avenue de l'Observatoire, Paris 6^e)

18-19. **Mycotoxins in Foodstuffs**, intern. symp., Cambridge, Mass. (G. N. Wogan, Rm 16-210-B, Massachusetts Inst. of Technology, Cambridge 02139)

18-20. **Chemurgic Council**, 28th natl. conf., Philadelphia, Pa. (J. W. Ticknor, Chemurgic Council, 350 Fifth Ave., New York 1)

18-21. **Latin Medical Union**, intern. congr., Rome, Italy. (B. Urso, Policlinico Umberto I, Viale Policlinico, Rome)

18-21. **American Orthopsychiatric Assoc.**, Chicago, Ill. (M. F. Langer, 1790 Broadway, New York 19)

19-22. **International Assoc. for Dental Research**, 42nd meeting, Los Angeles, Calif. (J. C. Muhler, 1120 W. Michigan St., Indianapolis, Ind. 46202)

20-24. **National Assoc. for Research in Science Teaching**, Chicago, Ill. (G. G. Mallinson, Western Michigan Univ., Kalamazoo)

20-24. **National Science Teachers Assoc.**, Chicago, Ill. (R. H. Carleton, 1201 16th St., NW, Washington, D.C.)

21-3. **British Computer Soc.**, conf., Edinburgh, Scotland. (Secretariat, I.E.E., Savoy Pl., London, W.C.2, England)

21-23. **Asian-Pacific Dental Federation**, 4th congr., Singapore and Malaya. (B. B. Eraña, Manila Doctors Hospital, Isaac Peral St., P.O. Box 373, Manila, Philippines)

21-24. **Cybernetic Medicine**, 3rd intern. congr., Naples, Italy. (A. DeChiara, 348, Via Roma, Naples)

22-25. **American Assoc. of Dental Schools**, 41st annual, Los Angeles, Calif. (AADS, 840 Lake Shore Dr., Chicago 11, Ill.)

23-24. **Society for Economic Botany**, 5th annual, Chapel Hill, N.C. (D. J. Rogers, New York Botanical Garden, Bronx Park, N.Y.)

23-25. **Federation of European Biochemical Societies**, 1st, London, England. (FEBS, Lister Inst., Chelsea Bridge Rd., London, S.W.1)

23-26. **Institute of Electrical and Electronics Engineers**, intern. conv., New York, N.Y. (IEEE, Box A, Lenox Hill Station, New York 21)

23-26. **Gas Chromatography**, 2nd intern. symp., Houston, Tex. (A. Zlatkis, Dept. of Chemistry, Univ. of Houston, Houston)

23-26. American **Physical Soc.**, Philadelphia, Pa. (K. K. Darrow, Columbia Univ., New York 27)

24-26. **Physics and Dynamics of Clouds**, conf., American Meteorological Soc., Chicago, Ill. (Miss D. L. Bradbury, Dept. of Geophysical Sciences, Univ. of Chicago, Chicago)

25-27. **Aerospace Bearings**, USAF-Southwest Research Inst. conf., unclassified, San Antonio, Tex. (P. M. Ku, SwRI, 8500 Culebra Rd., San Antonio)

25-27. **Entomological Soc. of America**, Northcentral branch, Omaha, Neb. (G. E. Guyer, Dept. of Entomology, Michigan State Univ., East Lansing)

26-28. **Michigan Acad. of Science, Arts and Letters**, East Lansing (G. G. Mallinson, Western Michigan Univ., Kalamazoo)

26-28. **Southern Soc. for Philosophy and Psychology**, 56th annual, Lexington, Ky. (D. Calvin, Psychology Dept., Univ. of Kentucky, Lexington)

27-28. American **Ethnological Soc.**, Pittsburgh, Pa., (N. F. S. Woodbury, U.S. National Museum, Smithsonian Institution, Washington, D.C.)

27-28. **Seismological Soc. of America**, annual, Seattle, Wash. (K. V. Steinbrugge, SSA, 465 California St., San Francisco 4, Calif.)

27-29. Society for the Study of **Evolution**, annual, Chapel Hill, N.C. (H. H. Ross, Illinois Natural History Survey, Urbana)

28-30. American Assoc. of Colleges of **Pharmacy**, Detroit, Mich. (C. W. Bliven, 1507 M St., NW, Washington, D.C. 20005)

29-2. Association of American **Geographers**, annual, Syracuse, N.Y. (AAG 1201 16th St., NW, Washington, D.C.)

30-2. American Assoc. of **Junior Colleges**, Bal Harbour, Fla. (W. G. Shannon, AAJC, 1777 Massachusetts Ave., NW, Washington, D.C. 20036)

31-3. American Assoc. of **Anatomists**, Denver, Colo. (L. B. Flexner, Dept. of Anatomy, Univ. of Pennsylvania, Philadelphia 4)

31-3. **Calcified Tissues**, European symp., Liège, Belgium. (L. J. Richelle, 32, Boulevard de la Constitution, Liège)

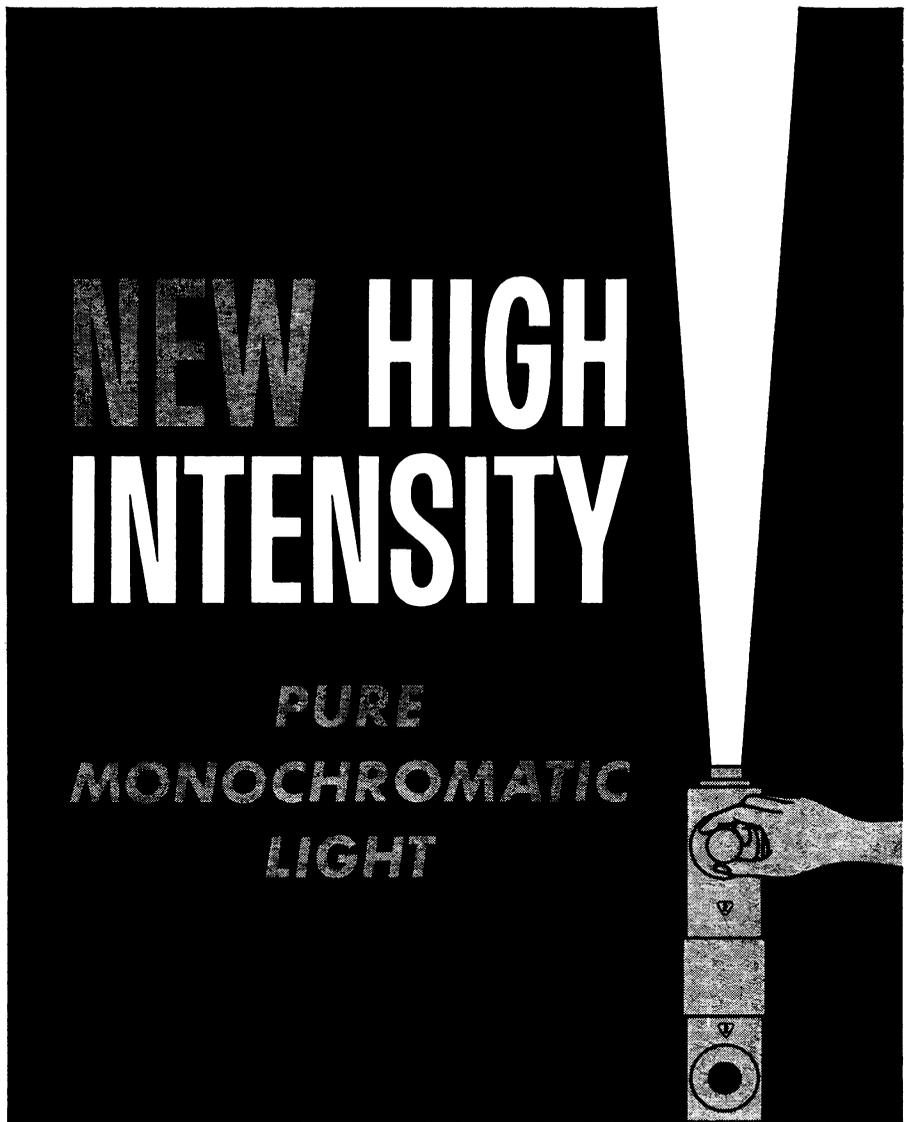
April

1. **Thermoplastic Materials**, conf., Soc. of Plastics Engineers, Akron, Ohio. (W. H. Nicol, RETEC, Goodyear Tire and Rubber Co., Akron 16)

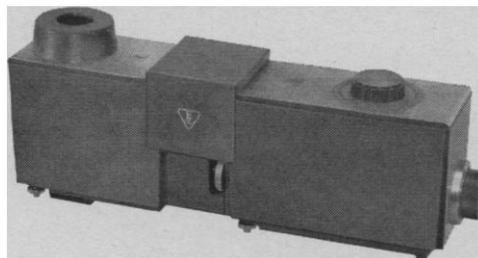
1-2. **Engineering Aspects of Magneto-hydrodynamics**, symp., Cambridge, Mass. (G. S. Janes, Avco Everett Research Laboratories, Everett 49, Mass.)

1-2. Methods for Measurement of **Weak Beta-Emitters**, Karlsruhe-Leopoldshaven, Germany. (Gesellschaft Deutscher Chimiker, Gesellschaftsstelle, Postfach 9075, Frankfurt/Main, Germany)

1-3. **Structures and Materials**, American Inst. of Aeronautics and Astronautics, 5th annual conf., Palm Springs, Calif. (R. R. Dexter, AIAA, 2 E. 64 St., New York, N.Y.)



NEW BAUSCH & LOMB GRATING MONOCHROMATOR



Compare it! See the dazzling difference! This new B&L Monochromator produces strikingly brighter light than any other instrument anywhere near its low price and small size. And wider dispersion, which is linear throughout all wavelengths. Just dial

the IR, UV or visible wavelength you need. Five interchangeable gratings let you pinpoint any wavelength in the entire range from 2000A to 32000A. And the price is just as newsworthy. Only \$880* to \$1390*, depending on your choice of light sources and slit sets. Try it out and see for yourself.

*Suggested Retail Price

BAUSCH & LOMB 

<p>BAUSCH & LOMB INCORPORATED 75902 Bausch Street Rochester 2, N. Y.</p>	<input type="checkbox"/> Please demonstrate the new B&L High-Intensity Monochromator.
	<input type="checkbox"/> Please send me Catalog D-2025.
<p>Name</p>	<p>(PLEASE PRINT)</p>
<p>Professional Address</p>	

In Canada, write Bausch & Lomb Optical Co., Ltd., Dept. 759, Scientific Instrument Division, 16 Grosvenor St., Toronto 5, Canada