SCIENCE

1 January 1965
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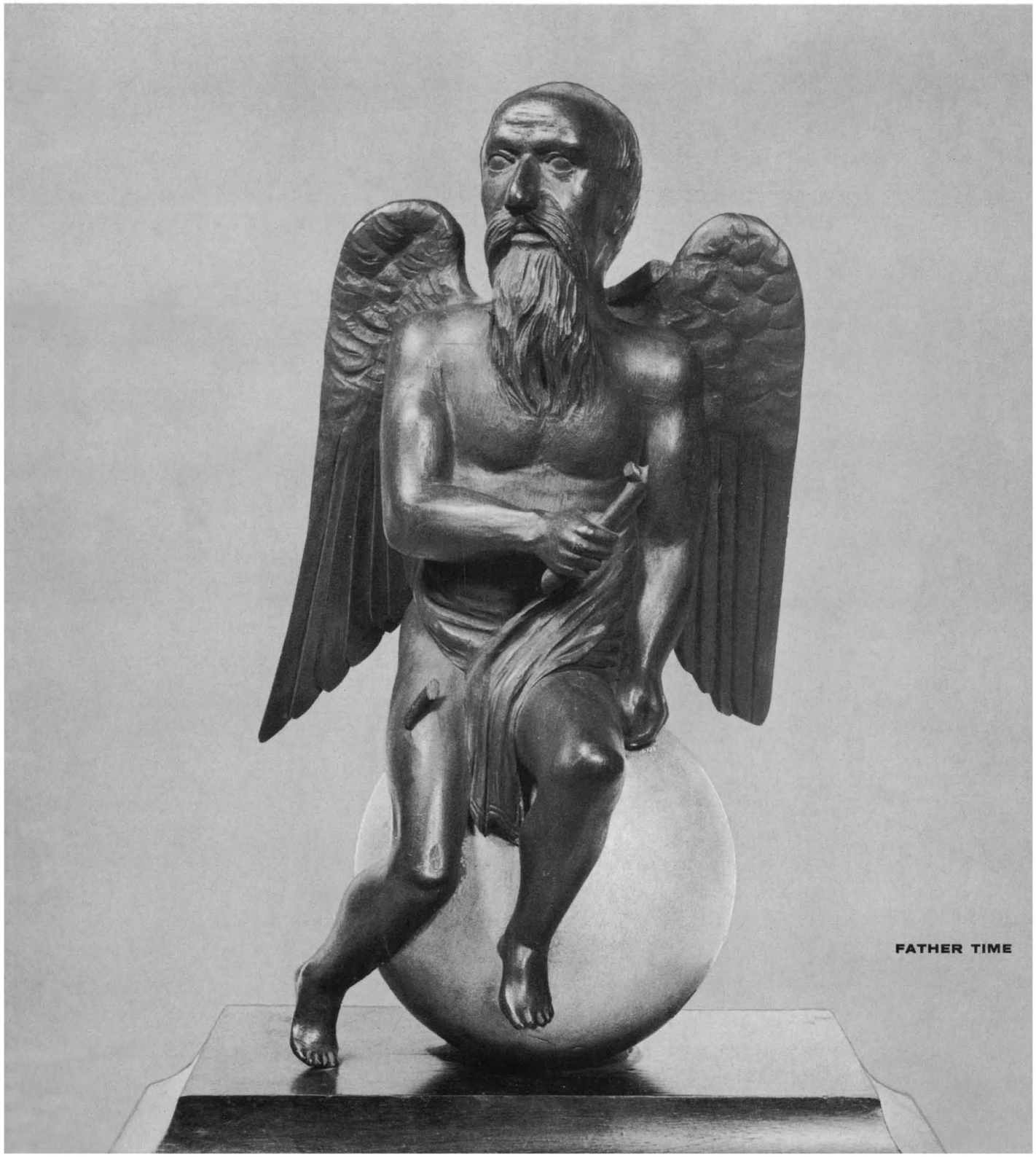
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



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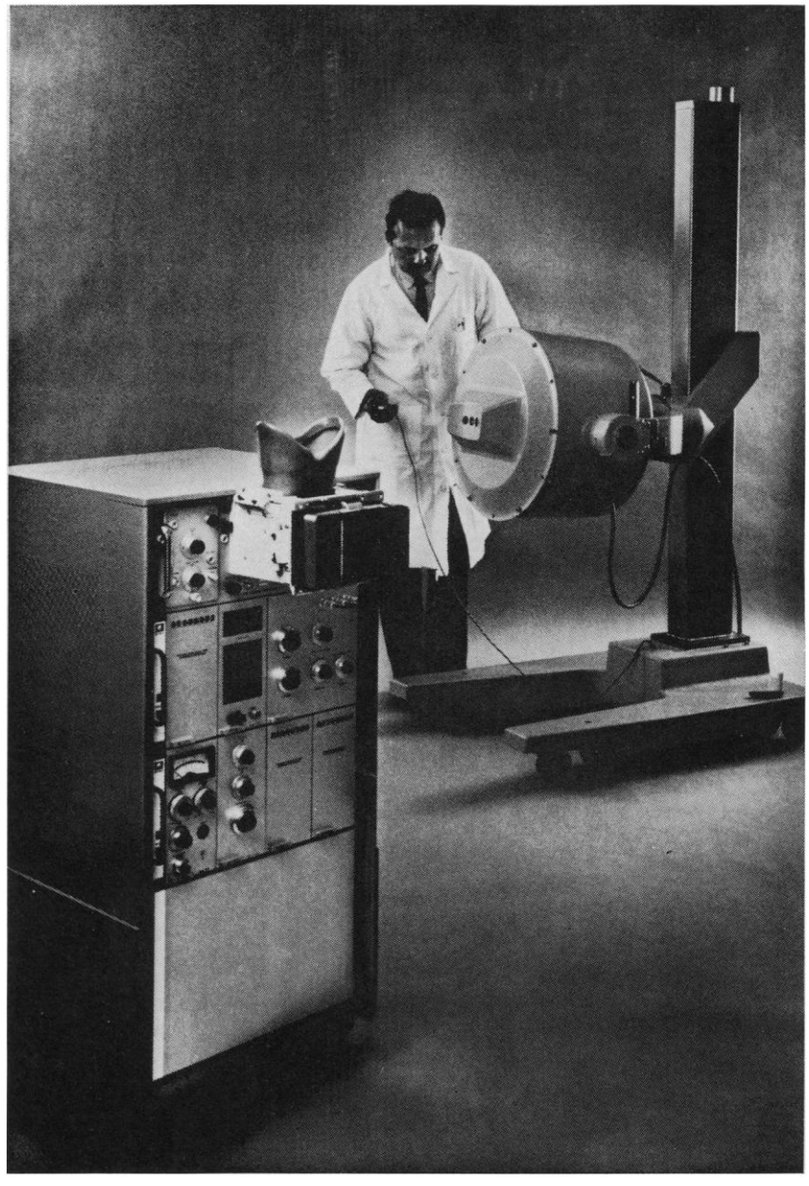

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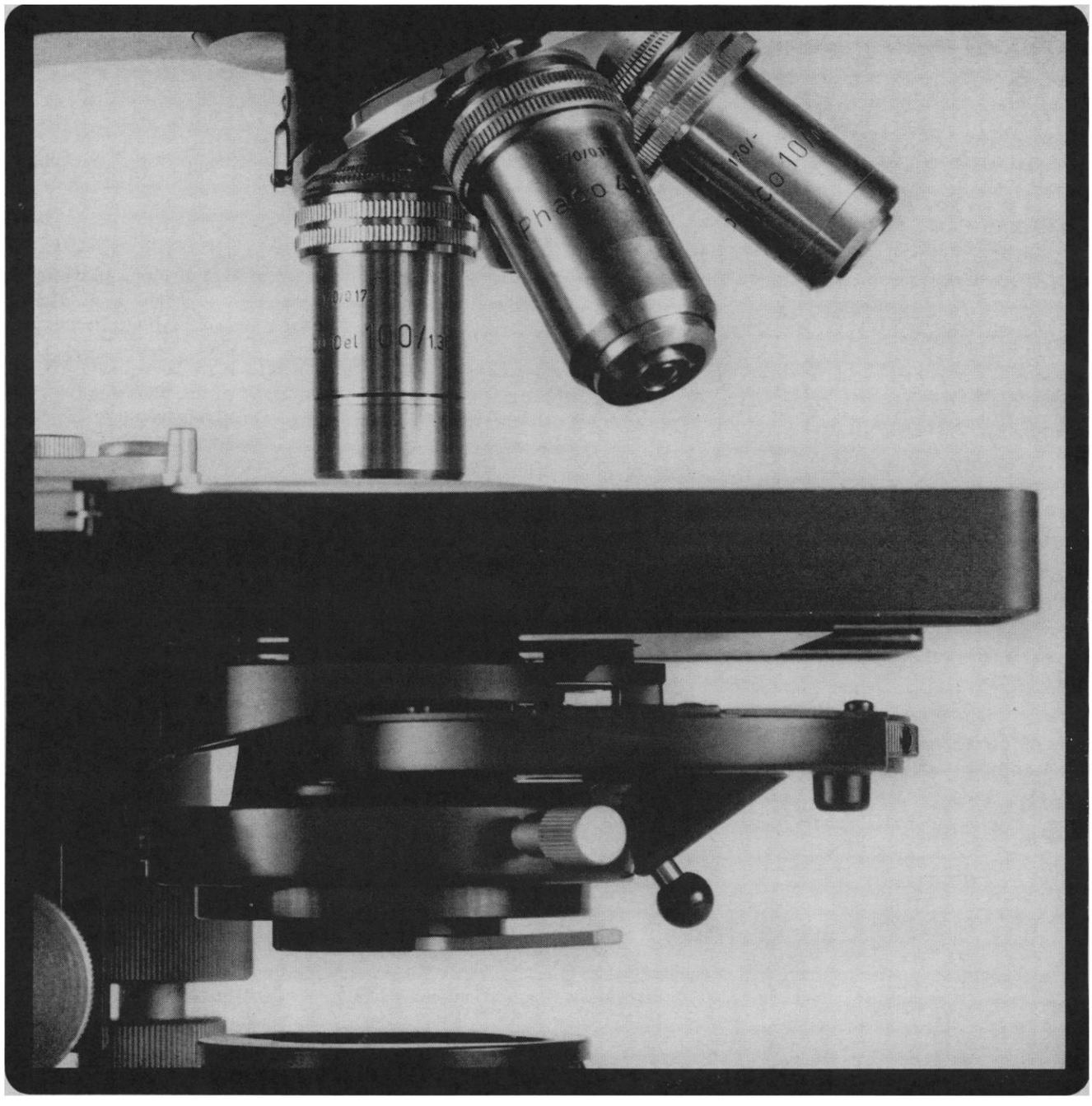
COVER

Trade sign used in the shop of Samuel Thaxter (1769–1842) who made and sold surveying and nautical instruments in Boston. The sign, now in the collection of the Bostonian Society, is the handiwork of the Skillin brothers who were famous for their figureheads and other carved figures. See review of *Early American Scientific Instruments and Their Makers*, page 41.



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1 January 1965, Volume 147, Number 3653

SCIENCE

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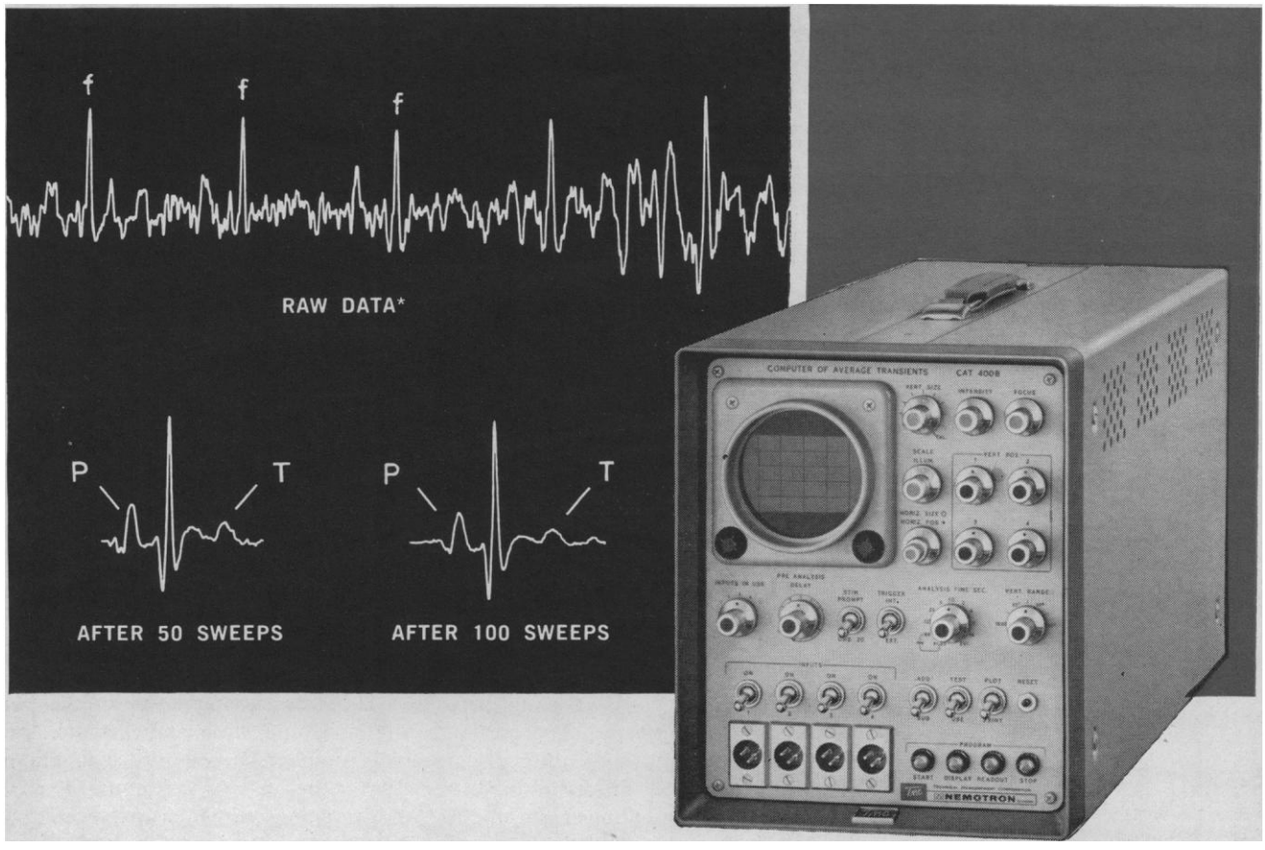
Justifying Basic Research

The concept of science held by the average intelligent reader of newspapers and magazines is related almost entirely to considerations of utility, such as spacecraft and rocketry, atomic bombs and nuclear power, radar and color television, and other products of technology which lend themselves to journalistic exploitation. To him, basic research has little significance and meaning. Nor is this a matter for wonderment, for relatively few results that have come out of the burgeoning basic research projects are readily identifiable with major utilization in the economy. The misgivings of members of Congress about voting large sums for basic research also are readily understandable. Neither they nor their constituents have adequate background to estimate benefits. Congress attempts to obtain evaluations of research during hearings on agency budgets. These hearings are supposedly designed to give opportunity to representatives of the agencies to prove that they need the funds set forth in their budgets. To be convincing and persuasive about basic research before the Subcommittee on Appropriations of the House is an annual chore, difficult and sometimes disagreeable. A congressman must maintain an attitude of skepticism. In most cases the appeals for favorable action are based on past practical results where some basic research has "paid off," and the expression of strong expectation that past results are but a prologue. Persuasive examples are few, and because of the difficulty in avoiding their use in successive years, their efficacy wears thin. "Please don't tell us about hybrid corn again," was the comment of one congressman in a hearing.

Indeed, one can sympathize with a congressman who requests an exhibit to show that results of basic research have justified past appropriations. Perhaps the best that can be done is to express hope and possibly conviction that not only has knowledge been advanced but that social and human values have emerged from the efforts made possible by the funds appropriated for basic research.

That public funds of the magnitude devoted to research should be wisely and honestly administered and used is elementary. Elementary also is the proposition that the justification for spending public funds on basic research is the reasonable expectation that the results of the effort will contribute to the national interest. Surely no obligation rests on the taxpayer to support basic research merely for the delectation of the researcher. The utmost wisdom and integrity must therefore prevail both in the making of proposals by the researchers and their institutions and in the granting of awards in response to the proposals.

When one considers this picture in detail, one must give much credit to the members of the Congress for having "gone along" with the agencies having responsibility for encouraging and supporting basic research. Moreover, it prompts the admonition that scientists who benefit from the appropriations, and their universities, as well as government scientists and administrators doing "in-house" basic research, remain constantly aware of their obligation of integrity towards the taxpayer who makes their work possible. The most important figure in the picture is the scientist himself. He must be exceedingly circumspect in his asking for the support and in his use of the funds provided, to assure the continuing goodwill of the public and the Congress towards him and his work.—PAUL E. KLOPSTEG, *828 Apple Tree Lane, Glenview, Illinois*



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** Data courtesy of E. H. Hon, M.D., S. T. Lee, M.D., See "Noise Reduction in Fetal Electrocardiography", AMERICAN JOURNAL OF OBSTETRICS AND GYNECOLOGY, December 1963.*

TMC TECHNICAL MEASUREMENT CORPORATION

American Meteorological Society, the Central Radio Propagation Laboratory of the National Bureau of Standards, and the U.S. Weather Bureau. It was organized under the general chairmanship of J. S. Marshall (McGill University and chairman of the Joint Committee of the URSI-UGGI on Radio Meteorology). Members of the Program Committee were John A. Saxton, chairman (United Kingdom Scientific Attache to the United States and vice chairman of Commission II, URSI), Stuart Bigler (U.S. Weather Bureau), David Atlas (Air Force Cambridge Research Laboratory), Jack W. Herbstreit (Central Radio Propagation Laboratory and secretary of Commission II, URSI), and J. S. Marshall. It is believed that the objective of the conference, to strengthen the community of interest among the many specialized fields in radio meteorology, was realized. A limited number of copies of the proceedings volume are available from the American Meteorological Society, 40 Beacon St., Boston, Massachusetts.

JACK W. HERBSTREIT
Central Radio Propagation Laboratory, National Bureau of Standards, Boulder, Colorado

Forthcoming Events

January

5–8. **Solid State Physics**, 2nd annual conf., H. H. Wills Physics Laboratory, University of Bristol, England. (Administrative Assistant, Inst. of Physics and Physical Soc., 47 Belgrave Sq., London S.W.1, England)

6–8. **Industrial Electronics and Control Instrumentation**, 13th annual conf., Philadelphia, Pa. (E. Weiss, Sun Oil Co., Marcus Hook, Pa.)

6–9. **Psychopharmacological** Conf., Czechoslovak Medical Soc., Psychiatry Section, Jesenik Spa. (M. Vojtechovsky, Budejovicka 800, Pavilion A1, Prague, Czechoslovakia)

8–9. **Orthopaedic** Research Society, New York, N.Y. (R. A. Calandruccio, 869 Madison Ave., Memphis, Tenn.)

9–14. American Acad. of **Orthopedic Surgeons**, annual, New York, N.Y. (H. K. Hart, AAOS, 29 E. Madison, Chicago 2, Ill.)

10–16. The **New Science**, symp., Colorado Springs, Colo. (F. A. Sondermann, Colorado College, Colorado Springs)

11–14. **Civilian and Military Uses of Aerospace**, conf., New York, N.Y. (I. B. Laskowitz, New York Acad. of Sciences, 2 E. 63 St., New York)

12–14. **Reliability and Quality Control**, symp., Miami, Fla. (H. D. Hulme, Westinghouse R&D Center, Bldg. 601-1346, Churchill Boro, Pittsburgh, Pa.)

12–15. **Crustacea**, symp., Cochin, India. (Marine Biological Assoc. of India, Marine Fisheries P.O., Mandapam Camp, South India)

14. American **Genetic** Assoc., Washington, D.C. (W. R. Singleton, Biology Bldg., Univ. of Virginia, Charlottesville)

18–20. **Solar Radiation Simulation**, intern. conf., Los Angeles, Calif. (H. F. Sander, Inst. of Environmental Science, 34 S. Main St., Mount Prospect, Ill.)

19. American Inst. of **Mining, Metallurgical**, and **Petroleum** Engineers, Metallurgical Soc., 7th mechanical working conf., Pittsburgh, Pa. (R. W. Shearman, Secretary, Metallurgical Soc. of AIME, 345 E. 47 St., New York 10017)

19. **Cor Pulmonale**, New York Heart Assoc., New York, N.Y. (NYHA, 10 Columbus Circle, New York 10019)

19–20. **Die Design and Press Tooling** Conf., American Soc. of Tool and Manufacturing Engineers, Hartford, Conn. (M. Zapico, Asst. Conf. Director, ASTME, 10700 Puritan Ave., Detroit 38, Mich.)

20–22. **Instrumentation**, College Station, Tex. (P. T. Eubank, Chemical Engineering Dept., Texas A&M Univ., College Station)

20–23. National Soc. of **Professional Engineers**, New Orleans, La. (P. H. Robbins, 2029 K St., NW, Washington, D.C.)

22. **Bibliographical** Soc. of America, New York, N.Y. (Mrs. H. C. Ralph, P.O. Box 397, Grand Central Station, New York 10017)

22–1. **Earthquake Engineering**, 3rd world conf., Auckland and Wellington, New Zealand. (Administrative Secretary, Third World Conf. on Earthquake Engineering, P.O. Box 5180, Wellington)

22–23. **Blood**, annual symp., Detroit, Mich. (W. H. Seegers, Dept. of Physiology and Pharmacology, Wayne State Univ. College of Medicine, Detroit)

22–23. **Hydrocarbon Analysis**, symp., American Soc. for Testing and Materials, Houston, Tex. (ASTM, 1916 Race St., Philadelphia 3, Pa.)

25–26. **Fundamental Phenomena in the Material Sciences**, 3rd annual symp., Boston, Mass. (D. B. Fay, Ilikon Corp., Natick Industrial Centre, Natick, Mass.)

25–26. **Viruses of Laboratory Rodents**, symp., Atlanta, Ga. (R. Holdenried, Natl. Cancer Inst., NIH, Bethesda, Md. 20014)

25–27. American Inst. of **Aeronautics and Astronautics**, New York, N.Y. (J. Bidwell, AIAA, 1290 Avenue of the Americas, New York 10019)

25–28. American **Meteorological** Soc., annual, New York, N.Y. (K. Spengler, AMS, 45 Beacon St., Boston 8, Mass.)

25–28. American Society of **Heating, Refrigerating and Air-Conditioning Engineers**, Chicago, Ill. (R. C. Cross, 345 E. 47 St., New York 10017)

25–28. Modern Methods of **Analytical Chemistry**, 18th annual intern. symp., Baton Rouge, La. (P. W. West, Dept. of Chemistry, Louisiana State Univ., Baton Rouge)

25–28. **Cardiovascular Diseases**, 2nd natl. conf., Washington, D.C. (C. H. Maxwell, 9650 Wisconsin Ave., NW, Washington, D.C. 20014)

25–29. American **Mathematical** Soc., Denver, Colo. (G. L. Walker, AMS, 190 Hope St., Providence, R.I.)

25–29. American Soc. for **Testing and Materials**, steel meeting, Mexico City, Mexico. (H. H. Hamilton, Public Rela-

tions, ASTM, 1916 Race St., Philadelphia, Pa. 19103)

25–30. American **Library** Assoc., Washington, D.C. (D. H. Clift, ALA, 50, E. Huron St., Chicago, Ill.)

26. Quasi Stellar **Radio Sources**, American Inst. of Physics, New York, N.Y. (E. H. Kone, AIP, 335 E. 45 St., New York)

26. **Mossbauer Effect Methodology**, symp., New York, N.Y. (M. Ress, New England Nuclear Corp., 575 Albany St., Boston, Mass.)

26–29. Canadian **Pulp and Paper** Assoc., technical, annual, Montreal. (Miss J. M. McKenzie, CPPA, Technical Section, 2280 Sun Life Bldg., Montreal 2)

27–30. American **Group Psychotherapy** Assoc., annual, San Francisco, Calif. (AGPA, Inc., 1790 Broadway, Room 516, New York, N.Y. 10019)

27–30. American **Physical** Soc., New York, N.Y. (K. K. Darrow, Pupin Physics Laboratory, Columbia Univ., New York)

27–30. **Electrochemistry**, 5th seminar, Karaikudi-3, South India. (M. A. V. Devanathan, Central Electrochemical Research Institute, Karaikudi-3)

27–30. **Geological** Soc., Southwestern Federation, Austin, Tex. (S. P. Ellison, Jr., Department of Geology, Univ. of Texas, Austin)

27–31. **Neurosurgical** Soc. of America, San Juan, Puerto Rico. (C. H. Davis, Jr., Bowman Gray School of Medicine, Winston-Salem, N.C.)

28–29. Interactions of **Man and His Environment**, symp., Chicago, Ill. (W. K. Stuckey, Dept. of Public Relations, 1802 Chicago Ave., Northwestern Univ., Evanston, Ill. 60201)

28–29. **Rheology** Soc., winter meeting, Santa Barbara, Calif. (R. S. Porter, California Research Corp., Richmond Laboratory, 576 Standard Ave., Richmond, Calif. 94802)

28–30. American **Geophysical** Union, southwest regional, Socorro, N.M. (J. B. Franzini, Civil Engineering Dept., Stanford Univ., Stanford, Calif.)

28–30. International **Medical** Assembly of Southwest Texas, San Antonio. (S. E. Cockrell, Jr., 202 W. French Pl., San Antonio 12)

28–30. **Large-Scale Air-Sea Interaction**, symp., Bombay, India. (UNESCO, Office of Oceanopraphy, Pl. de Fontenoy, Paris 7", France)

28–30. **Mathematical** Assoc. of America and American Mathematics Soc., Denver, Colo. (H. M. Gehman, MAA, Univ. of Buffalo, Buffalo 14, N.Y.)

28–30. Selected Topics in **Cardiology**, conf., American College of Cardiology, Gainesville, Fla. (G. L. Scheibler, ACC, 350 Fifth Ave., New York, N.Y. 10001)

29–31. Southern **Radiological** Conf., Point Clear, Ala. (M. Eskridge, P.O. Box 4097, Mobile, Ala.)

31–2. Institute of **Electrical and Electronics** Engineers, New York, N.Y. (C. A. Woodrow, c/o General Electric Co., 1 River Rd., Schenectady 5, N.Y.)

31–5. Institute of **Electrical and Electronics** Engineers, New York, N.Y. (E. C. Day, IEEE, Box A. Lenox Hill Station, New York 10021)

31–6. International Festival of the **Scientific Film**, Brussels, Belgium. (Cercle des Sciences. Université Libre de Bruxelles, 22 avenue Paul Heger, Brussels 5)