

# SCIENCE

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

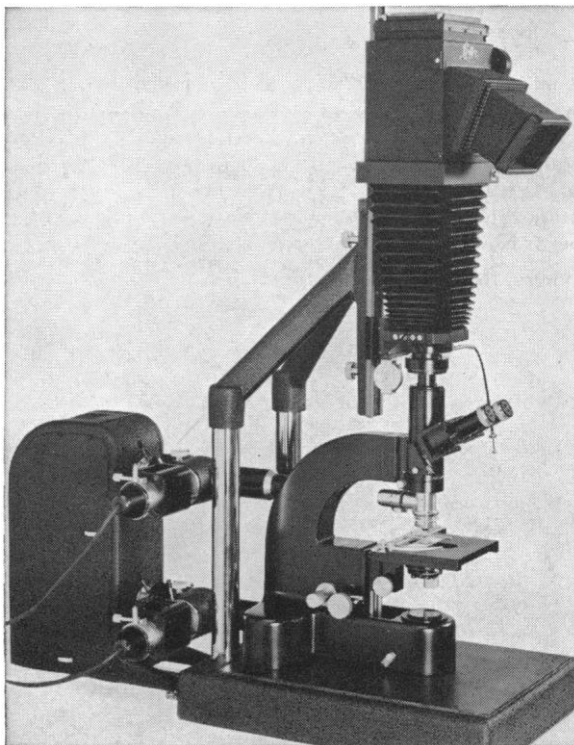




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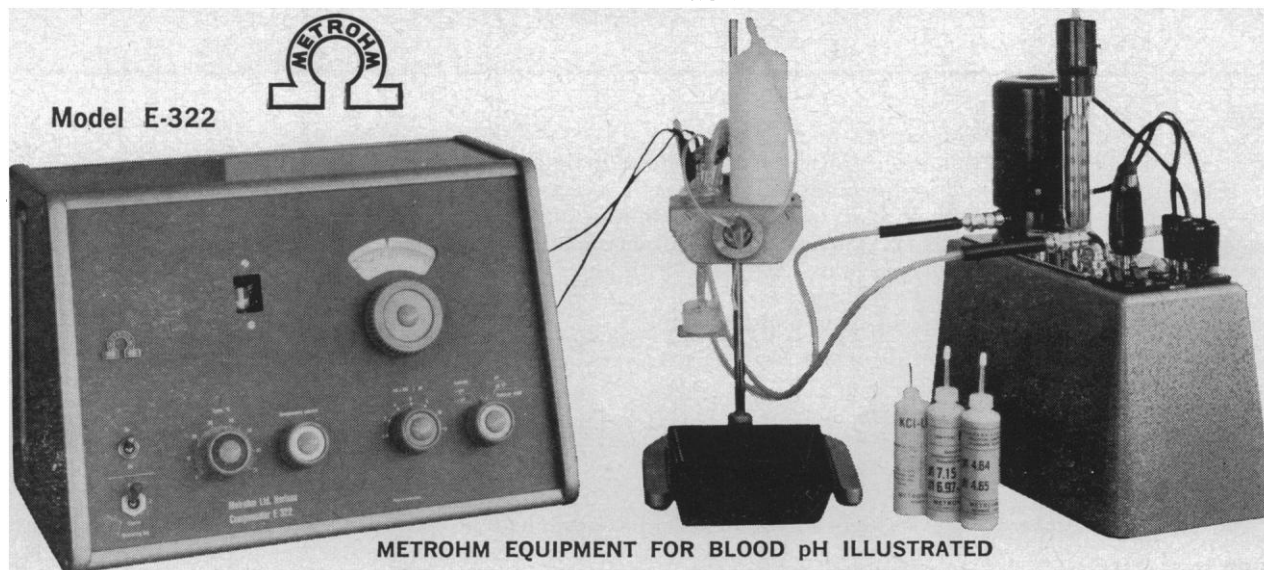
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<b>Editorial</b>	Orbiting Words .....	1283
<b>Articles</b>	Semiconducting Compounds: <i>E. Mooser</i> .....	1285
	New semiconductors reveal striking relations between composition and structure.	
	Doomsday: Friday, 13 November, A.D. 2026: <i>H. von Foerster, P. M. Mora, L. W. Amiot</i> .....	1291
	At this date human population will approach infinity if it grows as it has grown in the last two millenia.	
	Charles Singer, Historian of Medicine, Science, Technology: <i>T. I. Williams</i> .....	1296
<b>Science in the News</b>	Nixon and Kennedy on the Geneva Test Ban Talks, Disarmament; Burnet and Medawar Share Nobel Award in Physiology and Medicine .....	1297
<b>Book Reviews</b>	R. G. Tugwell's <i>The Enlargement of the Presidency</i> , reviewed by <i>H. Finer</i> ; other reviews .....	1305
<b>Reports</b>	Glass Insulated Platinum Microelectrode: <i>M. L. Wolbarsht, E. F. MacNichol, Jr., H. G. Wagner</i> .....	1309
	Isolation of Uridine Diphosphate-Glycosyl Compounds from the Slug: <i>R. W. Wheat</i> ..	1310
	A Difference between Biological Effects of Gamma Rays and Heavy Ions: <i>F. Hutchinson and S. S. Easter, Jr.</i> .....	1311
	Nerve-End Recording in Conducting Volume: <i>D. M. Easton</i> .....	1312
	Three $\gamma$ -Globulins in Normal Human Serum Revealed by Monkey Precipitins: <i>S. Dray</i> ..	1313
	Three-Dimensional X-ray Reflections from Anthracite and Meta-Anthracite: <i>S. Ergun, M. Mentser, H. J. O'Donnell</i> .....	1314
	Effects of Supernumerary Chromosomes on Production of Pigment in <i>Haplopappus gracilis</i> : <i>R. C. Jackson and P. Newmark</i> .....	1316
	Estimate of the Human Load of Mutations from Heterogeneous Consanguineous Samples: <i>N. Freire-Maia and A. Freire-Maia</i> .....	1317
<b>Association Affairs</b>	Programs Planned for the AAAS New York Meeting .....	1318
<b>Departments</b>	Forthcoming Events .....	1325
<b>Cover</b>	The Missouri Botanical Garden's new Climatron, a geodesic dome greenhouse, is reflected in a lily pool at the century-old St. Louis Gardens. See page 1300.	

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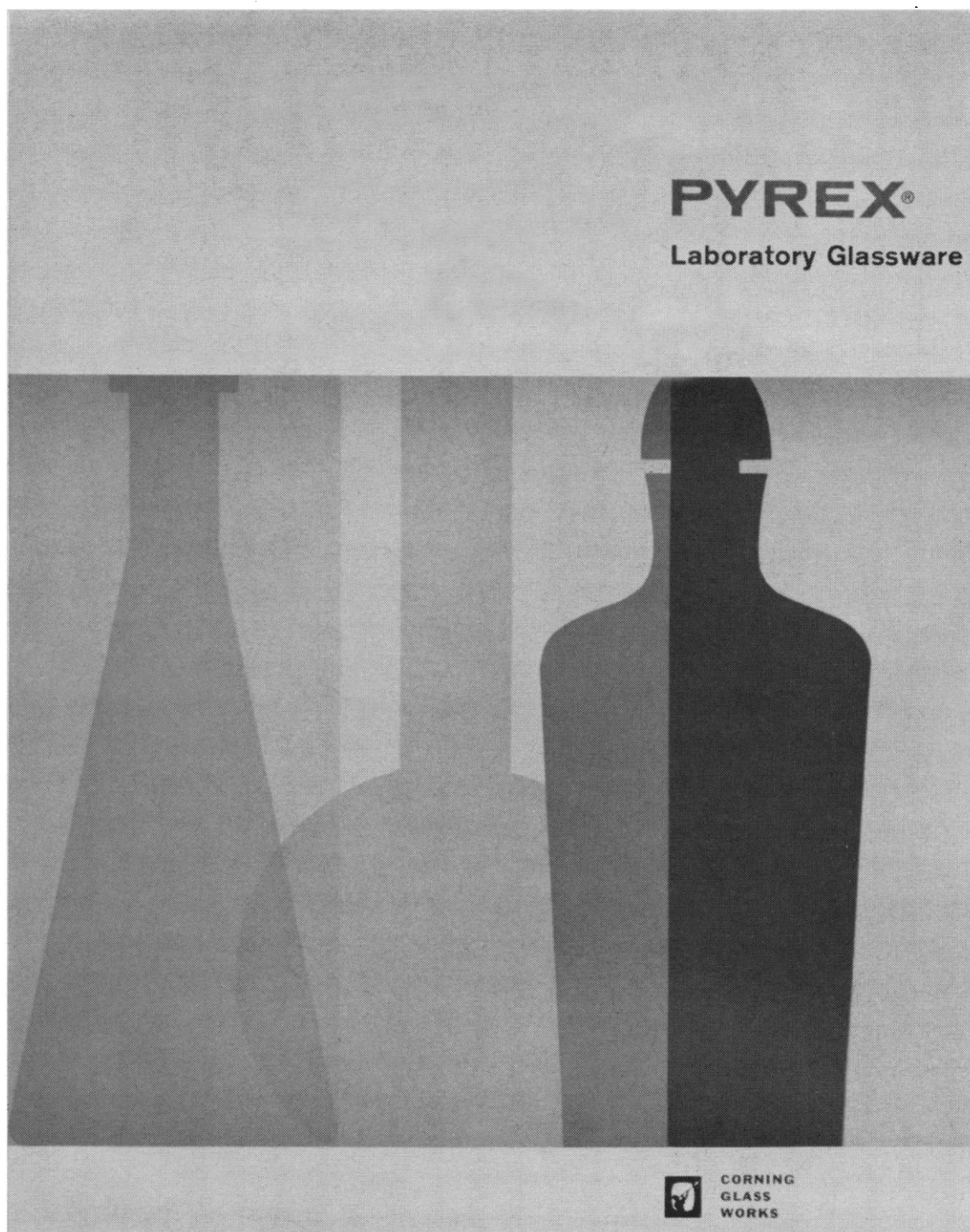
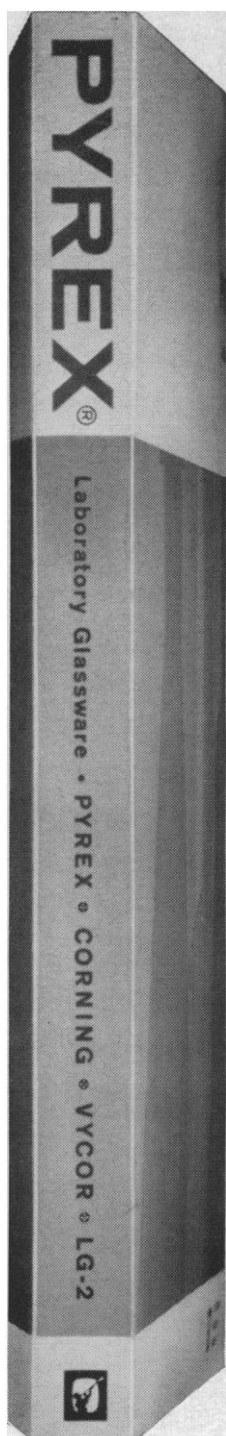
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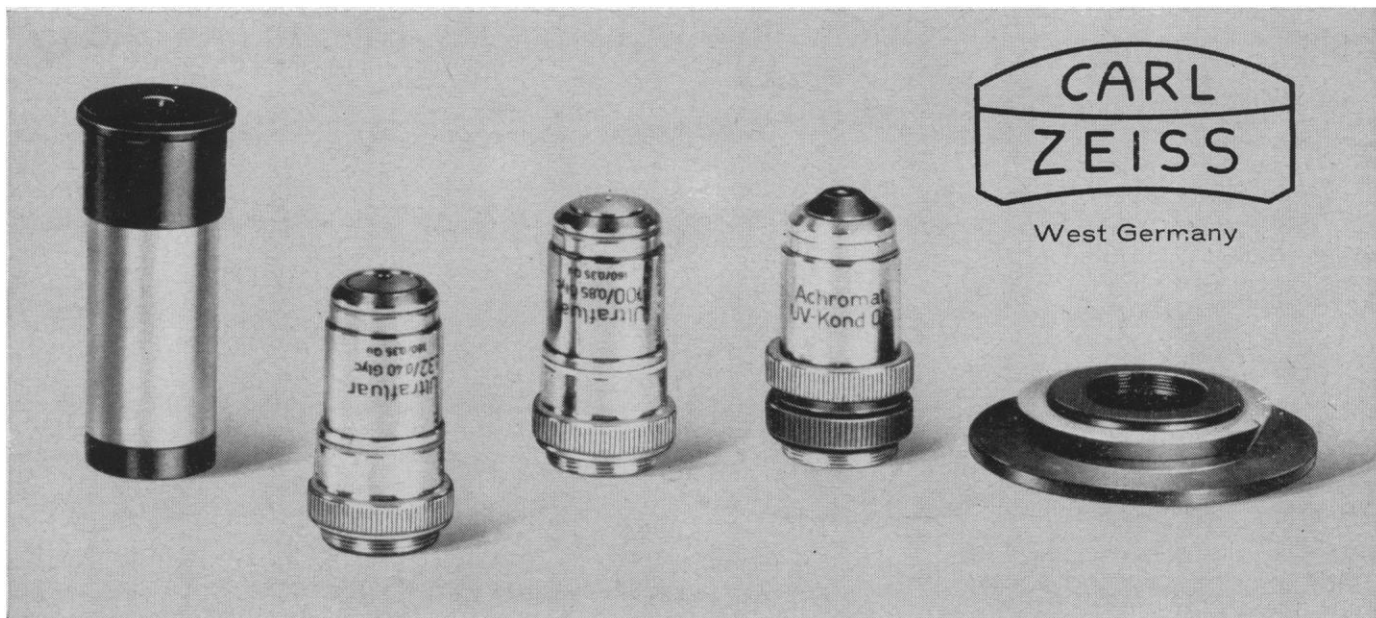
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## Orbiting Words

In the last 20 years the number of telephones in the world has risen from 27 million to more than 192 million. This vast communications network is linked intercontinentally by radio, which varies in dependability with changes in the ionosphere, and by a few transoceanic cables. People here and abroad have been quick to see in communications satellites a way to escape from the present limitations on overseas communications.

Scientists of the American Telephone and Telegraph Company recently proposed to the Federal Communications Commission that the company be licensed to start an experimental program within a year. Ultimately, company officials would like to operate 50 active repeater satellites in random polar orbits to link 13 pairs of transmitter-receiver stations in different parts of the world. The cost of this system, which would provide 600 telephone circuits between each pair of terminals, would be about \$115 million, if each satellite could be launched for \$1 million and the ground installations cost \$65 million. If a two-way television channel were to be added for each pair of terminals, costs would rise to \$170 million.

It is apparent that A.T.&T. officials think the satellite proposal both technically and economically feasible. In this they are not alone. W. F. Hilton, writing in the British journal the *New Scientist* (6 October), states that relaying telephone calls by satellite will be "the most lucrative" of the civil uses of space and advocates a British program. He assumes that a satellite system could compete economically with cables and radio with only 50-percent launching success and a 1-year life for the satellites. If 90-percent launching success and a 22-year life could be attained, the cost of transoceanic calls could be reduced to one-fortieth of the present rate.

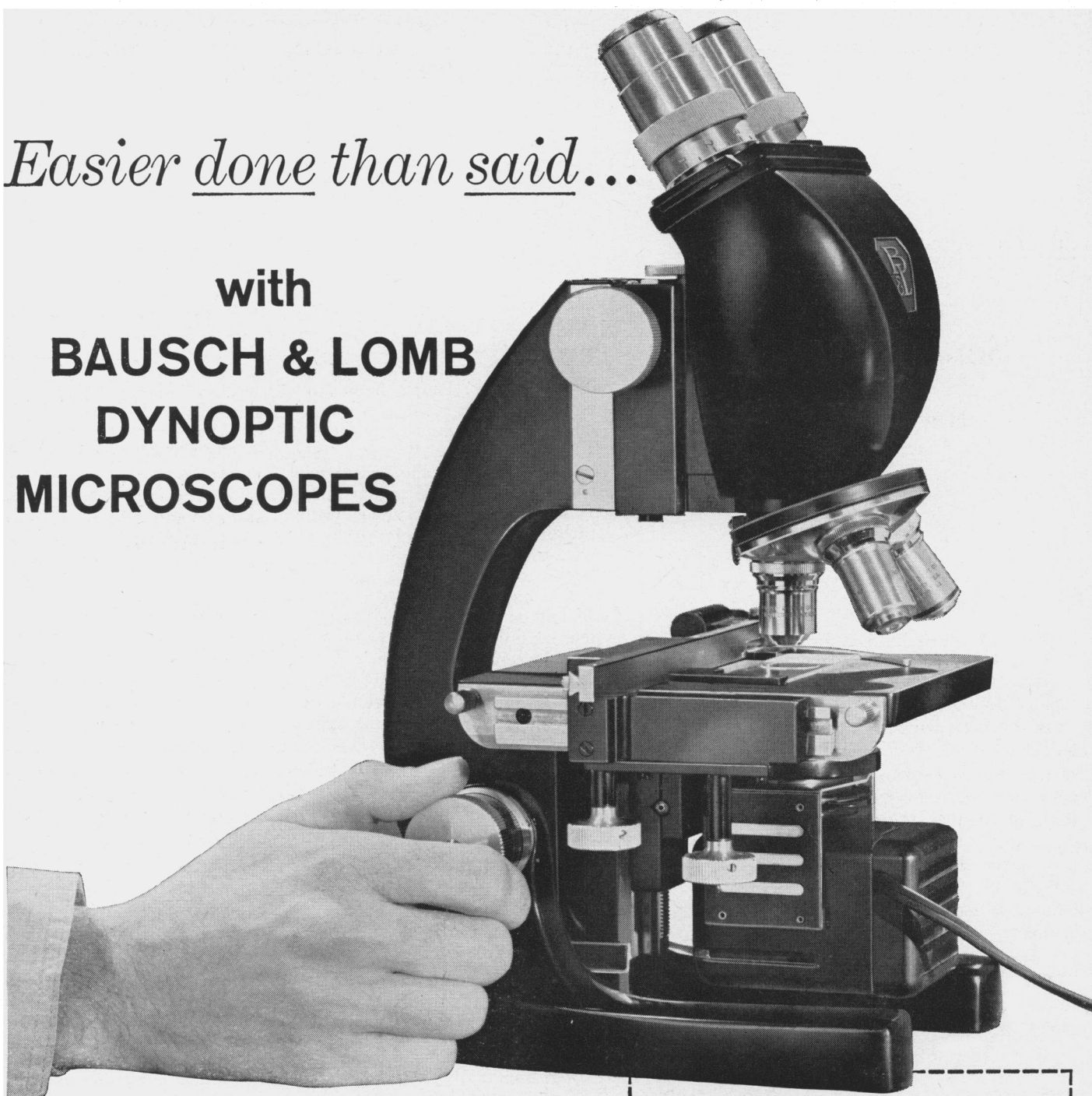
Both the British and the A.T.&T. proposals assume that the satellites would be launched "at cost." This means at immediate cost, but in this country Congress will have to decide whether account should be taken of the hundreds of millions of dollars that have made launching possible. Other policy questions arise. Should A.T.&T. be given a head start in commercial exploitation of space? What about the interests of other corporations? The same questions will have to be asked about other nations, for each has a valid claim to the use of space and to a fair allotment of frequency channels.

The limitations on available frequencies will, in fact, offer one of the greatest obstacles to establishment of a satellite network. The competition for channels is intense; the best channels for satellite use are already allocated for radar, public and private radio, radioastronomy, and experimental satellites. Should channels for commercial satellites be taken away from private users, whose allocations are under the control of the Federal Communications Commission, or from the military and civil defense, whose allocations are under the control of the Interdepartmental Radio Advisory Committee?

Even if satisfactory agreements can be worked out within the U.S., formidable obstacles remain. If the United States and the United Kingdom can agree on their shares of responsibility and on wavelength, they will still have to negotiate agreements with members of the International Telecommunication Union, which serves as the authority for frequency allocations among 101 nations. A formidable task for science and diplomacy!—G.DuS.

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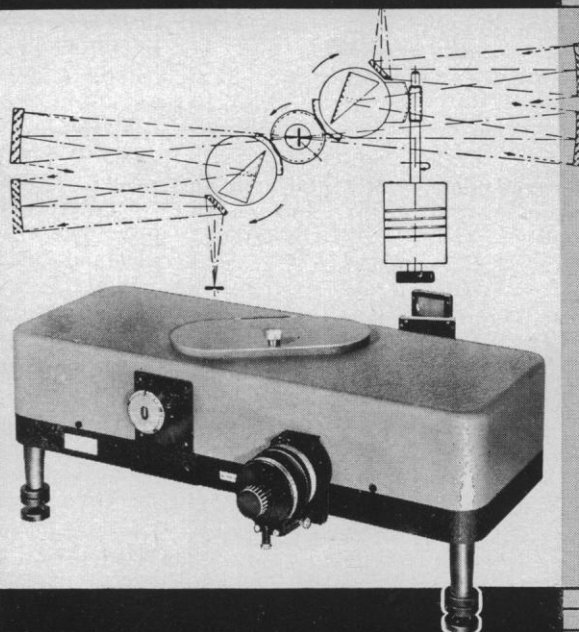


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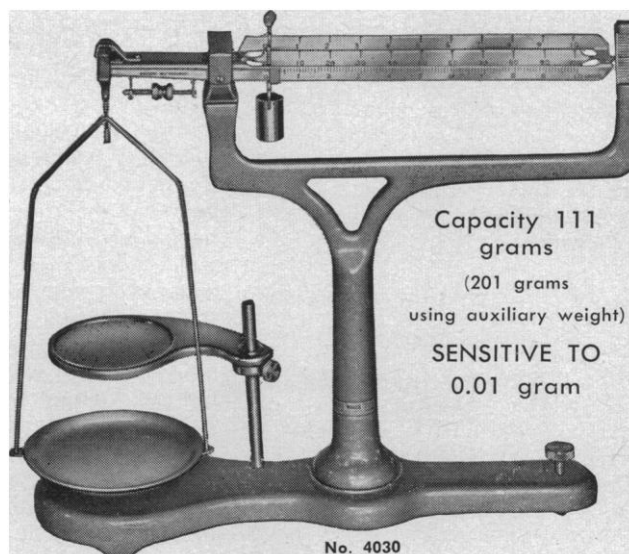
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Three sessions on "Comparative Endocrinology"; 28 and 29 Dec. Part I: Berta Scharrer, Albert Einstein College of Medicine, presiding. Part II: Howard A. Bern, University of California, Berkeley, presiding. Part III: Jerry J. Kollros, State University of Iowa, presiding.

Four sessions on "Comparative Physiology"; 28 and 29 Dec. Part I: K. Schmidt-Nielsen, Duke University, presiding. Part II: "Comparative Physiology of Muscle"; arranged by C. Ladd Prosser, University of Illinois, who will preside. Part III: "Physiology of Arthropods"; J. H. Welsh, Harvard University, presiding. Part IV: "Physiology of Arthropods"; Talbot H. Waterman, Yale University, presiding.

Three sessions on "Developmental Biology"; 28, 29, and 30 Dec. Part I: Howard L. Hamilton, Iowa State University, presiding. Part II: Mac V. Edds, Jr., Brown University, presiding. Part III: Melvin Spiegel, Dartmouth College, presiding.

Two sessions on "Vertebrate Morphology"; 29 Dec. Part I: Richard J. Baldauf, Texas A. and M. College, presiding. Part II: Harvey I. Fisher, University of Southern Illinois, presiding.

There will also be three single sessions on 30 Dec. I: "Invertebrate Zoology, Parasitology, and Protozoology"; II: "Genetics and Cytology"; III: "Experimental Biology".

Two-session symposium, a joint program of the Division of Animal Behavior and Sociobiology and the Section of Animal Behavior and Sociobiology of the Ecological Society of America, cosponsored by Section F—Zoological Sciences and the National Association of Biology Teachers: "Teaching Animal Behavior"; arranged by E. B. Hale, Pennsylvania State University; 30 Dec.

Part I: "Animal Behavior in Biology Teaching"; E. B. Hale, presiding. Papers will be presented on animal behavior as a biological discipline (J. P. Scott, Jackson Memorial Laboratory); animal behavior in college biology (Benson E. Ginsburg, University of Chicago); animal behavior in secondary school biology (Arthur J. Baker, Crystal Lake High School, Crystal Lake, Ill.).

Part II: "Techniques in Teaching Animal Behavior"; Arthur J. Baker, presiding. Papers will be presented on film instruction (C. R. Carpenter, Pennsylvania State University); vertebrate materials (William C. Dilger, Cornell University); invertebrate materials (Thomas Smyth, Jr., Pennsylvania State University); special projects (Walter Göhman, Iowa State Teachers College Laboratory School, Cedar Falls, Iowa).

Panel discussion, a program of the Education Committee, cosponsored by AAAS Section F—Zoological Sciences: "Research Opportunities for Undergraduates"; arranged by William Etkin, Albert Einstein College of Medicine, who will preside; 28 Dec. Panelists: John L. Fuller, Jackson Memorial Laboratory; Lyle W. Phillips, National Science Foundation; Evelyn Shaw, American Museum of Natural History; David Stone, Worcester Foundation for Experimental Biology.

Demonstrations will be held in the morning and afternoon of 29 and 30 Dec.

Business meeting of the Division of Comparative Physiology; 28 Dec. Business meeting of the Division of Developmental Biology; 28 Dec. Supper and business meeting of the Division of Comparative Endocrinology; 28 Dec. Lunch and organization meeting of the Division of Vertebrate Morphology; 29 Dec.

A business meeting of the Society will be held 29 Dec.

*Society of Systematic Zoology.* Symposium, cosponsored by the American Society of Zoologists and AAAS Section F—Zoological Sciences: "Famous Zoologists: A series of anecdotal talks and recollections about some famous, recently-deceased zoologists"; arranged by Carl L. Hubbs, Scripps Institution of Oceanography, and George W. Wharton, University of Maryland; Carl L. Hubbs, presiding; 27 Dec. Papers will be presented on Thomas Barbour (Alfred S. Romer, Museum of Comparative Zoology, Harvard University); Leonhart Stejneger (Waldo L. Schmitt, U.S. National Museum); Stephen A. Forbes (Harlow B. Mills, Illinois Natural History Survey, Urbana); Joseph Grinnell (Alden H. Miller, Museum of Vertebrate Zoology, University of California, Berkeley); A. S. Pearse (George W. Wharton and Carl L. Hubbs).

Preview and panel discussion: "The New International Code of Zoological Nomenclature Adopted by the XVth International Congress of Zoology in London" (soon to be published); arranged by W. I. Follett, California Academy of Sciences, and Charles F. Lytle, Tulane University; W. I. Follett, presiding; 29 Dec. Panel members: Ernst Mayr, Museum of Comparative Zoology, Harvard University; Curtis W. Sabrosky, U.S. Department of Agriculture.

There will be one session for contributed papers, at which R. Tucker Abbott, Academy of Natural Sciences of Philadelphia, will preside; 27 Dec.

An informal visit to the American Museum of Natural History has been arranged by Horace W. Stunkard for 29 Dec.

The Society's annual breakfast and

business meeting will be held 28 Dec. *American Society of Naturalists*. Two-session symposium, cosponsored by the American Society of Zoologists, the Ecological Society of America, and the Society for the Study of Evolution: "Modern Aspects of Population Biology"; arranged by Reed C. Rollins, Gray Herbarium, Harvard University; 27 Dec.

Part I; Reed C. Rollins, presiding. Papers will be presented on big and little populations—an amateur's excursion [L. C. Dunn, Columbia University (presidential address, American Society of Naturalists)]; niche specificity and diversity, with special reference to plankton (G. Evelyn Hutchinson, Yale University); the relation between laboratory and field investigations in population ecology (L. B. Slobodkin, University of Michigan).

Part II; Earl L. Green, Jackson Memorial Laboratory, presiding. Papers will be presented on experimental sympatric populations of *Clarkia* (Harlan Lewis, University of California, Los Angeles); phenotypic response to compatibility shift in wild populations of *Leavenworthia* (Reed C. Rollins); some recent theoretical contributions from zoogeography (E. O. Wilson, Harvard University); population effects of natural selection (Robert H. MacArthur, University of Pennsylvania).

A business meeting will be held 27 Dec.

*Beta Beta Beta Biological Society*. There will be an interim meeting of the Policy Committee on 27 Dec.

Beta Beta Beta is a cosponsor of the symposium of Alpha Epsilon Delta premedical honor society, "Career Opportunities in Medicine and Dentistry"; 29 Dec.

*Biomedical Information Processing Organization*. There will be one session of invited papers, arranged by Robert S. Ledley, National Biomedical Research Foundation, Inc., who will preside; 30 Dec. Papers will be presented on analog-digital devices and problems involved in suggesting standards (Harold K. Scramstead, National Bureau of Standards); function and nature of biomedical computer installation (Merrill M. Flood, University of Michigan); problems involved in sharing digital computer codes and programs (Walter M. Carlson, E. I. du Pont de Nemours and Company).

Organizational meeting and election of officers; Norman Z. Shapiro, presiding; 30 Dec.

*Ecological Society of America*. Symposium, cosponsored by AAAS Section H—Anthropology: "Ecology and Anthropology"; arranged by Paul Baker, Pennsylvania State University, who will preside; 28 Dec. Papers will be presented on ecology and nutritional stress

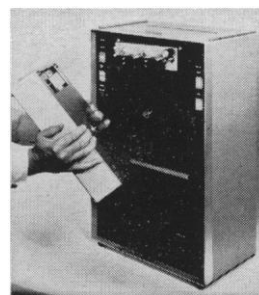


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in man (Marshall Newman, U.S. Naval Museum); cultural ecology of Teotihuacan Valley (William Sanders, Pennsylvania State University); application of ecology to physical anthropology (Frank Livingston, University of Michigan); cultural ecology and ethnography (Charles Frake, Stanford University); the application of ecological theory to recent anthropology (Paul Baker).

Human ecology luncheon, arranged by George B. Happ, Principia College; 29 Dec.

There will be two sessions of contributed papers on "Plant Ecology"; 28 and 29 Dec. Part I; Murray F. Buell, Rutgers State University, presiding. Part II; R. H. Whittaker, presiding. There will also be two sessions of contributed papers on "Animal Ecology"; 28 and 29 Dec. Part I; R. S. Miller, University of Saskatchewan, presiding. Part II; C. H. Southwick, Hamilton College, presiding. There will be one session of contributed papers on "Aquatic Ecology"; 29 Dec.; Paul G. Pearson, Ford Foundation, presiding. There will also be a session of contributed papers on "Human Ecology"; 29 Dec.; George B. Happ presiding.

Three special tours have been arranged—to the New York Zoological Park, the American Museum of Natural History, and the New York Aquarium.

*Nature Conservancy.* Open meeting of the National Committee for Natural Areas for Schools; arranged by John W. Brainerd, Springfield College, who will preside; 27 Dec. An introductory paper, "Helping schools study natural areas: Outdoor research for indoor education," will be presented by Dr. Brainerd. This will be followed by a series of small-group deliberations led by Stanley A. Cain, University of Michigan; Leslie A. Clark, Society for the Protection of New Hampshire Forests; David E. Davis, Pennsylvania State University; Charles Mohr, Philadelphia Academy of Natural Sciences; and Jacob Shapiro, Wisconsin State College.

*Society for the Study of Evolution.* Business meeting and general session; Alfred E. Emerson, University of Chicago, presiding; 29 Dec. Presidential address: "Vestigia: Characters of Termites and the Processes of Regressive Evolution" (Alfred E. Emerson); invitational address: "Reproductive Substitution as a Method of Voluntary Human Evolution Preferable to Differential Birth or Death Rates" (Hermann J. Muller, Indiana University).

There will be four sessions of contributed papers. Session I: "Phylogenetic Aspects of Evolution"; 28 Dec. Session II: "Genetic Aspects of Evolution"; 28 Dec. Session III: "Speciation and Variation"; 29 Dec. Session IV: "Ecological Aspects and Methods"; 29 Dec.

*Section G-Botanical Sciences.* Symposium: "Machine Methods in Biology"; arranged by David Rogers, New York Botanical Garden; I. D. Welt, National Research Council, presiding; 30 Dec. Papers will be presented on computer simulation of taxonomic methods (David Rogers, New York Botanical Garden); computer applications—processing of nonnumerical data (T. P. Tanimoto, IBM Research Center, Yorktown Heights, N.Y.); the use of computers in systematic and other zoological research (Robert R. Sokal, University of Kansas); pattern recognition, morphology, and generation of hypotheses (Leonard Ornstein, Mount Sinai Hospital, New York).

Several other symposia are being held jointly with Section F—Zoological Sciences.

There will be two sessions for contributed papers at which Harriet B. Creighton, Wellesley College, will preside; 28 Dec. and 30 Dec.

*Torrey Botanical Club.* Two-session symposium, cosponsored by AAAS Section G—Botanical Sciences: "Fundamental Developments in Plant Growth"; arranged by Annette Hervey, New York Botanical Garden; 27 Dec.

Part I; Paul Burkholder, Brooklyn Botanic Garden, presiding. Papers will be presented on changing concepts of photosynthesis (Daniel Arnon, University of California); fundamental developments in the field of plant growth regulators (John Mitchell, Crops Research Division, U.S. Department of Agriculture, Beltsville, Md.); alteration of plant growth by chemicals (N. E. Tolbert, Michigan State University); "plant-animals" as experimental tools for growth studies (Seymour H. Hutner, Haskins Laboratories, New York).

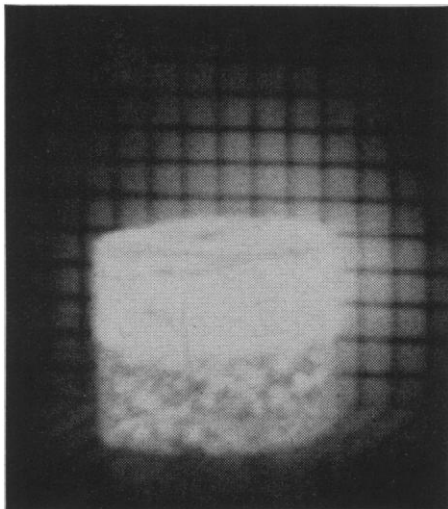
Part II; George McNew, Boyce Thompson Institute, presiding. Papers will be presented on the photoperiodic control of flowering (Harry A. Borthwick, Crops Research Division, U.S. Department of Agriculture, Beltsville, Md.); test-tube studies on flowering (William S. Hillman, Yale University); relation of antimetabolites to plant growth (Thomas H. Jukes, American Cyanamid Company); recent progress and the goals of plant tissue culture (Walter Tulecke, Boyce Thompson Institute).

Botanists' luncheon and vice-presidential address of Section G, to be held jointly with AAAS Section G—Botanical Sciences and the Botanical Society of America; Father Charles A. Berger, presiding; 27 Dec. Speakers will be Father Berger; William C. Steere, New York Botanical Garden; and Barry Commoner, Washington University, who will give the vice-presidential address of Section G: "In Defense of Biology."



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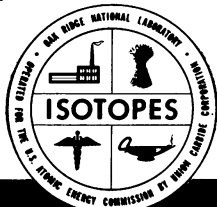
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## Meetings

### Forthcoming Events

#### November

21-23. Fluid Dynamics, annual, Baltimore, Md. (R. J. Emrich, Div. of Fluid Dynamics, APS, Dept. of Physics, Lehigh Univ., Bethlehem, Pa.)

24-25. American Physical Soc., Chicago, Ill. (K. K. Darrow, APS, 538 W. 120 St., New York 27)

24-26. Central Assoc. of Science and Mathematics Teachers, 60th annual conv., Detroit, Mich. (L. A. Conrey, School of Education, Univ. of Michigan, Ann Arbor)

25-26. American Soc. of Animal Production, Chicago, Ill. (C. E. Terrill, Animal Husbandry Research Div., Agricultural Research Center, Beltsville, Md.)

25-26. National Council for Geographic Education, Cincinnati, Ohio. (L. Kennemer, Univ. of Texas, Austin)

25-26. Bahamas Medical Conf., Nassau. (B. L. Frank, P.O. Box 4037, Fort Lauderdale, Fla.)

27-1. Latin American Cong. of Neurology, Santiago, Chile. (R. Nunez, Almirante Montt 485, Dep. 11, Santiago, Chile)

27-2. American Soc. of Mechanical Engineers, annual, New York, N.Y. (A. B. Conlin, Jr., ASME, 29 W. 39 St., New York 18)

27-5. International Federation of Agricultural Producers, 11th conf., New Delhi, India. (IFAP, 1624 Eye St., NW, Washington 6)

28-1. Entomological Soc. of America, Atlantic City, N.J. (R. H. Nelson, 4603 Calvert Rd., College Park, Md.)

29-2. American Medical Assoc., Washington, D.C. (F. Blasingame, 1535 N. Dearborn St., Chicago 10, Ill.)

30-2. Steels in Reactor Pressure Circuits, symp., London, England. (Secretary, Iron and Steel Inst., 4 Grosvenor Gardens, London, S.W.1)

#### December

1-16. Commission for Climatology, 3rd session, London, England. (World Meteorological Organization, Campagne Rigot, 1, avenue de la Paix, Geneva, Switzerland)

2-5. Central American Medical Conf., 8th, Panama City. (A. Bissot, Departamento de Salud Publica, Ministerio de Trabajo, Prevision Social y Salud Publica, Panama)

3-6. Visual Communications, 4th annual intern. cong., Chicago, Ill. (Visual Communications Cong., 10600 Puritan Ave., Detroit 38, Mich.)

3-8. American Acad. of Dermatology and Syphilology, Chicago, Ill. (R. R. Kierland, First National Bank Building, Rochester, Minn.)

4-6. Spectroscopy, annual southern seminar, Gainesville, Va. (Annual Seminar on Spectroscopy, Univ. of Florida, Gainesville)

4-7. American Inst. of Chemical Engineers, annual, Washington, D.C. (F. J. Van Antwerpen, AIChE, 25 W. 45 St., New York 36)

4-9. Radiological Soc. of North America, Cincinnati, Ohio. (D. S. Childs, 713 E. Genesee St., Syracuse 2, N.Y.)

5-7. American Soc. of Agricultural En-

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5-7. Electronic Industries Assoc., 3rd conf. on maintainability of electronic equipment, San Antonio, Tex. (E. B. Harwood, Office of the Secretary of Defense, Room 3D1018, Pentagon, Washington 25)

5-8. American Rocket Soc., 15th annual, Washington, D.C. (R. L. Hohl, ARS, 500 Fifth Ave., New York 36)

5-8. American Soc. of Agronomy, annual, Chicago, Ill. (L. G. Monthey, ASA, 2702 Monroe St., Madison 5, Wis.)

7-13. American Acad. of Optometry, San Francisco, Calif. (C. C. Koch, 1506-08 Foshay Tower, Minneapolis 2, Minn.)

9-10. The Myocardium—Its Biochemistry and Biophysics, New York, N.Y. (A. P. Fishman, New York Heart Assoc., 10 Columbus Circle, New York 19)

9-11. American Psychoanalytic Assoc., New York, N.Y. (D. Beres, 151 Central Park West, New York 23)

10-11. Academy of Psychoanalysis, New York, N.Y. (J. H. Merin, 125 E. 65 St., New York 21)

11-14. Hot Laboratory and Equipment Conf., 8th, San Francisco, Calif. (J. R. Lilienthal, Los Alamos Scientific Laboratory, P.O. Box 1663, Los Alamos, N.M.)

12-14. American Nuclear Soc. (Isotopes and Radiation Div.), San Francisco, Calif. (O. J. Du Temple, ANS, 86 E. Randolph St., Chicago 1, Ill.)

12-14. Water Pollution, natl. conf., Washington, D.C. (Natl. Conf. on Water Pollution, F. A. Butrico, Office of Engineering Resources, Div. of Engineering Services, U.S. Public Health Service, Washington 25)

12-16. Atomic Industrial Forum, conf., San Francisco, Calif. (D. J. Scherer, 3 E. 54 St., New York 22)

13-15. Eastern Joint Computer Conf., New York, N.Y. (E. C. Kubie, EJCC, Computer Usage Co., Inc., 18 E. 41 St., New York 17)

19-20. Statistical Mechanics, conf., London, England. (Organizing Secretary, Physical Soc., 1, Lowther Gardens, London)

22-2. Panamerican Diabetic Congress, 1st, British Honduras. (B. R. Hearst, Director, Diabetic Inst. of America, 55 E. Washington St., Suite 1646, Chicago 2, Ill.)

26-30. Inter-American Cong. of Psychology, 7th, Havana, Cuba. (G. M. Gilbert, Psychology Dept., Long Island Univ., Brooklyn 1, N.Y.)

26-31. American Assoc. for the Advancement of Science, annual, New York, N.Y. (R. L. Taylor, AAAS, 1515 Massachusetts Ave., NW, Washington 5.

The following 52 meetings are being held in conjunction with the AAAS annual meeting.

AAAS Committee on Science and the Promotion of Human Welfare (B. Commoner, Shaw School of Botany, Washington Univ., St. Louis 5, Mo.). 26, 28, 29 Dec.

AAAS Cooperative Committee on the Teaching of Science and Mathematics (J. R. Mayor, Director of Education, AAAS, Washington, D.C.). 28, 29 Dec.

Academy Conference (J. G. Arnold, Jr., Loyola Univ., New Orleans, La.). 26-27 Dec.

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Alpha Epsilon Delta (M. L. Moore, 7 Brookside Circle, Bronxville, N.Y.). 29 Dec.

American Assoc. of Clinical Chemists (H. Goldenberg, Dept. of Biochemistry, Hillside Hospital, P.O. Box 38, Glen Oaks, N.Y.). 26-27 Dec.

American Assoc. of Scientific Workers (Miss M. Yevick, 214 Western Way, Princeton, N.J.). 27 Dec.

American Astronautical Soc. (R. Fleisig, 58 Kilburn Rd., Garden City, N.Y.). 27 Dec.

American Astronomical Soc. (J. A. Hynek, Dearborn Observatory, Northwestern Univ., Evanston, Ill.). 28-31 Dec.

American Council on Women in Science (Miss E. B. Thurmann, Div. of Research Grants, National Insts. of Health, Bethesda 14, Md.). 27 Dec.

American Economic Assoc. (K. E. Boulding, Dept. of Economics, Univ. of Michigan, Ann Arbor). 26 Dec.

American Geophysical Union (R. Jastrow, NASA Theoretical Div., 8719 Colesville Rd., Silver Spring, Md.). 26 Dec.

American Nature Study Soc. (R. E. Hopson, 4138 S.W. Fourth Ave., Portland 1, Ore.). 27-30 Dec.

American Psychiatric Assoc. (P. H. Knapp, Boston Univ. School of Medicine, Boston, Mass.). 29, 30 Dec.

American Soc. of Criminology (D. E. J. MacNamara, New York Inst. of Criminology, 115-117 W. 42 St., New York 36). 26, 27 Dec.

American Soc. of Naturalists (R. C. Rollins, Gray Herbarium, Harvard Univ., 22 Divinity Ave., Cambridge 38, Mass.). 27 Dec.

American Soc. of Zoologists (R. L. Waterson, Dept. of Zoology, Northwestern Univ., Evanston, Ill.). 28-30 Dec.

American Sociological Assoc. (V. H. Whitney, Dept. of Sociology, Wharton School of Finance, Univ. of Pennsylvania, Philadelphia, Pa.). 28, 29 Dec.

American Statistical Assoc. (R. E. Lewis, New York Area Chapter, 55 Wall St., New York 15). 29 Dec.

Association of American Geographers (C. Morrison, Jr., American Geographical Soc., Broadway at 156 St., New York 32). 27-30 Dec.

Association for Computing Machinery (W. F. Cahill, NASA, 8719 Colesville Rd., Silver Spring, Md.). 29 Dec.

Astronomical League (Miss A. A. Pindar, Amateur Astronomers Assoc., Inc., 223 W. 79 St., New York 24). 28 Dec.

Beta Beta Beta Biological Soc. (Mrs. F. G. Brooks, P.O. Box 515, Ansonia Station, New York 23). 27 Dec.

Biomedical Information Processing Organization (R. S. Ledley, Natl. Biomedical Research Foundation, Silver Spring, Md.). 30 Dec.

Committee on Cosmetics, American Medical Assoc. (J. B. Jerome, 535 N. Dearborn St., Chicago 10, Ill.). 29 Dec.

Conference on Scientific Communication Problems (G. L. Seielstad, Technical Reports Group, Applied Physics Laboratory, Johns Hopkins Univ., Silver Spring, Md.). 26, 27 Dec.

Conference on Scientific Manpower (T. J. Mills, Natl. Science Foundation, 1951 Constitution Ave., NW, Washington 25). 27 Dec.

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