

Meetings

Unusual Conditions in the Pacific

During 1957 and early 1958 it became apparent that the weather, temperatures, and biology of the Pacific were undergoing changes that were quite outside the range of conditions of the last decade or more.

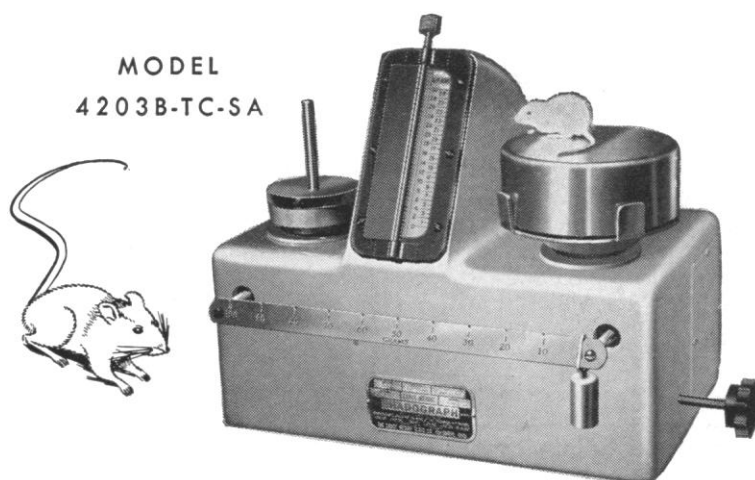
At the invitation of the Scripps Institution of Oceanography, 30 scientists met at Rancho Santa Fe, near San Diego, California, 2-4 June 1958, to consider the nature and causes of the unusual conditions (1).

Participants were from institutions on both coasts of North America and from Hawaii, Japan, and Peru, representing research in the fields of meteorology, oceanography, marine biology, and fishery biology, and included persons actively pursuing their research in the Pacific, from the Bering Sea to Peru and westward through the Central Pacific to Japan.

Data considered were the Northern Hemispheric circulation in the atmosphere, sea temperatures, sea level and currents of the Pacific, and the distribution of marine organisms. In addition, the symposium heard a report on the unusual solar events of 1957, when, in September, sun-spot activity reached a 250-year (all-time record) high. The possible relation to the unusual meteorology was discussed.

Another major departure from conditions in immediately preceding years and from those recorded over long-term periods consisted of the unusually strong development and the southeasterly position of the Aleutian low-pressure systems, especially during the winter of 1957-58; these changes produced markedly anomalous wind fields in middle latitudes of the eastern Pacific directed northeastward, and in the northwest Pacific directed southwestward. This was accompanied by unusually high sea temperatures over much of the eastern Pacific, from the Gulf of Alaska to the coasts of Peru. On the other hand, colder sea temperatures extended southward from the Bering Sea along the coast of Japan. Hawaii, during the summer of 1957, failed to experience the usual lowering of salinity connected with the seasonal oscillations of the subtropic convergence system. Sea levels were anomalously high along the West Coast of North America, by an average of 0.5 foot, with the anomaly appearing earliest and most pronouncedly along the coast of southern California. Drift bottles released 500 miles off the coast of British Columbia at latitude 50°N fetched up on beaches rimming the northern shore of the Gulf of Alaska instead of taking their more usual course eastward toward

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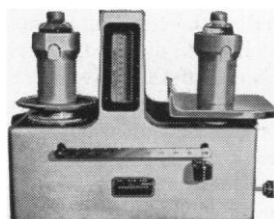
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British Columbia, Washington, and Oregon. A strongly developed coastal countercurrent along central and northern California, Oregon, and Washington was evidenced by drift bottles released in California waters.

The diatom and dinoflagellate flora monitored at the Scripps Pier at La Jolla, California, included considerable numbers of tropical forms previously rare or absent. Southern forms also were found far north of their expected range in California waters. Certain species of salps ordinarily confined to waters off southern California extended northward in coastal waters well beyond Point Conception, as did also certain euphausiids of similar normal range. Species of these two groups, which normally occupy the oceanic mid-Pacific waters, apparently did not spread eastward towards the North American coasts, however. As for the fishes, there were a number of records from farther north of tropical and subtropical species, and two species, the barracuda and yellowtail, usually caught by sportsmen in moderate numbers off southern California, were taken in numbers larger by an order of magnitude than the usual number. Dolphin fish were taken in entirely unprecedented numbers. Sardine spawning, which in the preceding 7-year period had been largely confined to waters off Lower California, in 1957 and 1958 took place in southern California waters. There was an indication that, in 1958, the pelagic phyllosome larvae of the spiny lobster were being better retained in the waters of southern California than in previous years.

The long-term records of such meteorological and oceanographic data as have been recorded systematically suggested that the conditions of 1957 and the winter of 1957-58 represented a marked reversal of conditions which had persisted during the previous decade and resembled roughly the conditions usual during the decade of the 1930's. The year 1958 appeared, at the time of this writing, to resemble the unusual years of 1926, 1931, and 1941.

Extensive consideration of theoretical models and empirical oceanographic observations led to the conclusion that the phenomena observed during 1957, which reached their peak in the winter of 1957-58, were undoubtedly the evidence of large-scale advection of water masses, but that the theory and the data so far analyzed are inadequate to distinguish the processes by which this advection took place. Particularly in question was the relative influence of transport from the offshore direction as compared with the transport alongshore from the south. The coastal countercurrent (sometimes called the Davidson Current) was more highly developed than in the immediately preceding years, but the mechan-

isms involved, and the role the coastal countercurrent played in the changed temperature field, remained obscure. Likewise, speculation on a possible displacement of the zonal North Pacific current system failed to produce an entirely satisfactory explanation.

In view of the obviously inadequate state of oceanographic observations and theory, it was felt that the conditions of 1957 and of the winter of 1957-58 should furnish strong motivation for determined efforts to evolve theories in conjunction with direct measurements of water movements and continued dynamic measurements on a much wider scale.

The symposium emphasized the point that local changes of conditions cannot be studied provincially but are part of Pacific-wide or possibly world-wide changes.

The proceedings of the symposium are to be published, and are to be dedicated to Bell Shimada and Townsend Cromwell, whose tragic and untimely deaths in an aircraft accident in Mexico occurred during the symposium.

JOHN D. ISAACS
*Scripps Institution of Oceanography,
La Jolla, California*

OSCAR E. SETTE
*Fish and Wildlife Service,
U.S. Department of the Interior,
Stanford, California*

Note

1. This report is a contribution from the Scripps Institution of Oceanography. It is based on a report to the American Society of Limnology and Oceanography, Logan, Utah, of 18 June 1958.

Forthcoming Events

May

18-22. American Soc. of Tool Engineers, 27th annual, Milwaukee, Wis. (ASTE, 10700 Puritan, Detroit 38, Mich.)

19-23. Oil and Gas Power Conf. (American Soc. of Mechanical Engineers), Houston, Tex. (O. B. Schier, ASME, 29 W. 39 St., New York 18.)

19-24. American Pharmaceutical Assoc., annual conv., Cincinnati, Ohio. (R. P. Fischelis, APA, 2215 Constitution Ave., Washington 7.)

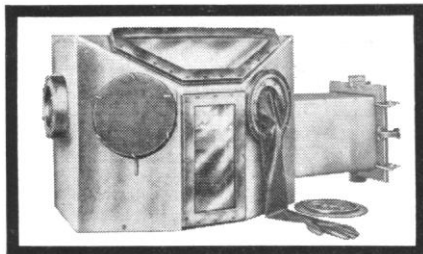
20-21. Analog and Digital Instrumentation, 3rd natl. conf. (American Inst. of Electrical Engineers), Philadelphia, Pa. (N. S. Hibshman, AIEE, 33 West 39 St., New York 18.)

20-22. American Oil Chemists' Soc., spring, 50th anniversary, New Orleans, La. (Mrs. L. R. Hawkins, 35 E. Wacker Dr., Chicago 1, Ill.)

20-22. Boundary Problems in Differential Equations, symp., Madison, Wis. (R. E. Langer, Mathematics Research Center, U.S. Army, 1118 W. Johnson St., Madison 6.)

20-23. American Urological Assoc., Atlantic City, N.J. (S. L. Raines, 188 S. Bellevue Blvd., Memphis, Tenn.)

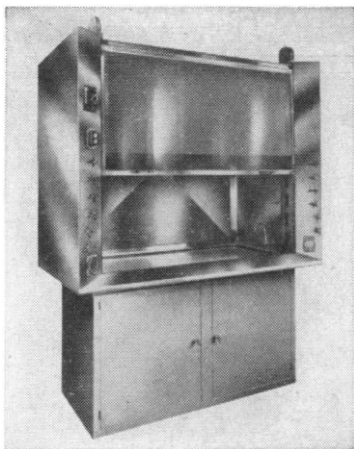
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20-23. International Anesthesia Research Soc., 33rd cong., Miami Beach, Fla. (A. W. Friend, IARS, E. 107 and Park Lane, Cleveland 6, Ohio.)

20-24. American College of Physicians, Chicago, Ill. (E. R. Loveland, 4200 Pine St. Philadelphia 4, Pa.)

20-26. International Acad. of Pathology, annual, Boston, Mass. (F. K. Mostofi, Armed Forces Inst. of Pathology, Washington 25.)

21-22. Electronic Data Processing, conf., Cincinnati, Ohio. (C. H. Osterbrock, IRE, Univ. of Cincinnati, Cincinnati, Ohio.)

21-23. American Assoc. for Thoracic Surgery, Los Angeles, Calif. (H. T. Langston, 7730 Carondelet Ave., St. Louis 5, Mo.)

21-23. German Starch Conv., Detmold, West Germany. (Assoc. of Cereal Research, Detmold, Am Schutzenberg 9, West Germany.)

21-25. Psychosomatic Research, 4th European cong., Hamburg, Germany. (H. Freyberger, II. Med. Univ.-Klinik und Poliklinik, Hamburg-Eppendorf, Germany.)

23-24. Molecular Genetics and Human Disease, symp., Syracuse, N.Y. (L. I. Gardner, Dept. of Pediatrics, State Univ. of New York, College of Medicine, Syracuse 10.)

23-25. American Assoc. of Pathologists and Bacteriologists, Boston, Mass. (R. L. Holman, 1542 Tulane Ave., New Orleans 12, La.)

23-25. Hawaii Medical Assoc., Hilo. (L. McCaslin, 510 S. Beretania St., Honolulu 13.)

23-25. Nuclear Reactor Theory; Finite Groups, 2 sympos. by Amer. Mathematical Soc., New York, N.Y. (E. G. Begle, Leet Oliver Hall, Yale Univ., New Haven, Conn.)

24. Illinois State Acad. of Science, 52nd annual, Chicago. (J. S. Ayars, Department of Registration and Education, State Natural History Survey Division, Urbana, Ill.)

24-25. American Assoc. of University Professors, Pittsburgh, Pa. (R. F. Fuchs, AAUP, 1785 Massachusetts Ave., NW, Washington 6.)

24-25. Georgia Acad. of Sciences, Macon. (R. J. Martin, Dept. of Geology, Emory Univ., Atlanta 22, Ga.)

24-25. Louisiana Acad. of Sciences, Ruston. (G. H. Ware, Northwestern State College, Natchitoches, La.)

24-25. South Dakota Acad. of Science, Yankton. (J. M. Winter, Botany Dept. State Univ. of South Dakota, Vermillion, S.D.)

25. West Virginia Acad. of Sciences, Huntington. (J. D. Draper, Bethany College, Bethany, W.Va.)

25-26. Population Assoc. of America, Providence, R.I. (D. O. Price, Box 630, Chapel Hill, N.C.)

25-30. Scientific Apparatus Makers Assoc., 41st annual, White Sulphur Springs, W. Va. (J. Irving, Director of Public Information, SAMA, 20 N. Wacker Drive, Chicago 6, Ill.)

25-1. Industrial Health Conf., Chicago, Ill. (Industrial Health Conf., Room 1313, 28 E. Jackson Blvd., Chicago 4.)

26-29. Industrial Medical Assoc., Chi-

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cago, Ill. (L. Arling, 3101 University Ave., SE, Minneapolis 14, Minn.)

27-28. Society of Exploration Geophysicists, 12th annual midwestern exploration, El Paso, Tex. (D. Dawson, Dawson Geophysical Co., Midland, Tex.)

27-28. Society of Neurological Surgeons, New York, N.Y. (B. S. Ray, 525 E. 68 St., New York 21.)

27-29. Aero Medical Assoc., Los Angeles, Calif. (T. H. Sutherland, P.O. Box 26, Marion, Ohio.)

27-30. Physical Chemistry of Extractive Metallurgy, intern. symp., Pittsburgh, Pa. (AIME, 29 W. 39 St., New York 18, N.Y.)

27-30. Physical Chemistry of Process Metallurgy, intern. symp., Pittsburgh, Pa. (J. F. Elliott, Room 8-109, Massachusetts Inst. of Technology, Cambridge 39.)

27-1. American Psychiatric Assoc., Philadelphia, Pa. (C. H. Hardin Branch, 156 Westminister Ave., Salt Lake City, Utah.)

29-1. American Inst. of Electrical Engineers, Syracuse, N.Y. (N. S. Hibshman, AIEE, 33 W. 39th St., New York 18.)

30-1. Eastern States Health Education Conf., New York, N.Y. (I. Galdston, New York Acad. of Medicine, 2 E. 103 St., New York 29.)

30-1. Youth Conference on the Atom, 1st natl., Atlantic City, N.J. (W. Adams, Bozell & Jacobs, Inc., 2 W. 45 St., New York 36.)

30-2. American Assoc. for Cleft Palate Rehabilitation, Philadelphia, Pa. (D. C. Spriestersbach, University Hospitals, Iowa City, Iowa.)

30-2. American Goiter Assoc., Chicago, Ill. (J. C. McClintock, 149½ Washington Ave., Albany, N.Y.)

30-2. American Physical Soc., Washington, D.C. (K. K. Darrow, Columbia Univ., New York 27, N.Y.)

30-2. Eastern College Science Conf., 13th annual, Boston, Mass. (A. F. Lett, ECSC, Suffolk Univ., Boston 14.)

30-2. Kansas Acad. of Sciences, Lawrence. (J. O. Harris, Kansas State College, Manhattan.)

30-3. Student American Medical Assoc., Chicago, Ill. (R. F. Staudacher, 430 N. Michigan, Chicago 11.)

30-4. American Assoc. for the Study of Neoplastic Diseases, Gatlinburg, Tenn. (B. H. Sisler, Box 268, Gatlinburg.)

May

1-3. Prevention of Bacterial Resistance to Antibiotics, intern. symp., Perugia, Italy. (Segreteria del Simposio, Clinica Ostetrica e Ginecologica, Policlinico, Perugia.)

2. Idaho Acad. of Science, Moscow. (E. J. Larrison, Sec.-Treas., Dept. of Biological Sciences, Univ. of Idaho, Moscow.)

2-3. American Psychosomatic Soc., 16th annual, Atlantic City, N.J. (M. Rosenbaum, APS, 265 Nassau Rd., Roosevelt, N.Y.)

2-7. Experimental Biology, intern. symp. (celebration of Lazzaro Spallanzani), Reggio and Pavia, Italy. (C. Jucci, Director, Istituti di Zoologia L. Spallanzani, Università-Pavia, Palazzo Botta, Pavia, Italy.)

2-9. International Union for Health Education of the Public, 4th conf., Dussel-



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3. American Federation for Clinical Research, annual, Atlantic City, N.J. (G. E. Schreiner, Georgetown Univ. Medical Center, Washington 7.)

3. Periapical Lesions-Pacific Coast Oral Pathology Workshop, 1st annual, Los Angeles, Calif. (W. Bullock, Dept. of Pathology, Univ. of Southern California School of Medicine, 1200 N. State St., Los Angeles.)

3-7. American Assoc. of Cereal Chemists, 44th annual, Washington, D.C. (J. W. Pence, AACC, Western Utilization Research Laboratories, Albany, Calif.)

3-7. Electrochemical Soc., Philadelphia, Pa. (Electrochemical Soc., Inc., 216 W. 102 St., New York 25.)

3-7. Electrode Processes, symp., Phila-

delphia, Pa. (Headquarters, Air Force Office of Scientific Research, Washington 25.)

3-7. Mechanical Properties of Inter-metallic Compounds, Philadelphia, Pa. (J. H. Westbrook, General Electric Research Laboratory, P.O. Box 1088, Schenectady, N.Y.)

4. American Soc. for Clinical Investigation, annual, Atlantic City, N.J. (W. W. Stead, J. Hillis Miller Health Center, Gainesville, Fla.)

4-5. Microcirculatory Conf., 7th annual meeting, NIH, Bethesda, Md. (B. W. Zweifach, 550 First Ave., New York 16.)

4-7. American Geophysical Union, annual, Washington, D.C. (W. E. Smith, AGU, 1515 Massachusetts Ave., NW, Washington 5.)

4-7. National Instrumentation Flight

Test Symp., 5th, Seattle, Wash. (H. T. Noble, Boeing Airplane Co., Flight Test Station, Wichita 1, Kan.)

4-8. American Soc. of Civil Engineers, Cleveland, Ohio. (W. H. Wisely, 33 West 39th St., New York 18.)

5-6. Association of American Physicians, annual, Atlantic City, N.J. (W. W. Stead, vice president, AFRC, J. Hillis Miller Health Center, Gainesville, Fla.)

5-6. Self-Organizing Systems, conf., Chicago, Ill. (S. Cameron, ICSOS Conference Secretary, Armour Research Foundation, 10 W. 35 St., Chicago 16.)

5-7. International Scientific Radio Union, spring meeting, Washington, D.C. (J. P. Hagen, National Acad. of Sciences, 2101 Constitution Ave., NW, Washington 25.)

5-9. Southwestern and Rocky Mountain Div., AAAS, Laramie, Wyo. (M. G. Anderson, New Mexico College of Agriculture and Mining, State College.)

5-12. Electronic Distance Measuring Equipment, Intern. Assoc. of Geodesy symp., Washington, D.C. (C. A. Whitten, Coast & Geodetic Survey, Washington 25.)

6-8. American Inst. of Chemists, Atlantic City, N.J. (L. Van Doren, American Inst. of Chemists, Inc., 60 E. 42 St., New York 17.)

6-8. American Pediatric Soc., Buck Hill Falls, Pa. (A. C. McGuinness, 2800 Quebec St., Washington 8.)

6-9. National Science Fair, 10th, Hartford Conn. (Science Clubs of America, 1719 N St., NW, Washington 6.)

6-10. Infectious Pathology, intern. cong., Milan, Italy. (A. Janussi, Secretary General, via Boccaccio 25, Milan.)

7-9. Midwestern Psychological Assoc., Chicago, Ill. (I. E. Farber, Dept. of Psychology, Univ. of Michigan, Ann Arbor.)

7-9. World Cong. on Agricultural Research, International Confederation of Agricultural Engineers and Technicians, Rome, Italy. (CITA, Regional Secretariat, 86, via Barberini, Rome.)

8-10. Uranium, 4th annual symp., Moab, Utah. (AIME, 29 W. 39 St., New York 18.)

9-11. International Soc. of Acupuncture, 10th cong., Paris, France. (SIA, 8 avenue Franklin Roosevelt, Paris 8^e.)

10-15. Society of American Bacteriologists, St. Louis, Mo. (E. M. Foster, Univ. of Wisconsin, Madison 6.)

10-14. American Soc. of Maxillofacial Surgeons, Chicago, Ill. (O. H. Stuteville, 700 N. Michigan, Chicago 11.)

11-12. Practical Problems of Coordinating and Integrating All Services Related to the Treatment, Training and Management of the Mentally Retarded, conf., Vineland, N.J. (J. D. Eadline, Training School, Vineland, N.J.)

11-13. Instrumentation and Computation in Process Development and Plant Design, symp., London, England. (Institute of Chemical Engineers, 16, Belgrave Sq., London, S.W.1.)

11-13. Microwave Theory and Techniques, natl. symp., Boston, Mass. (H. Pratt, Inst. of Radio Engineers, 1 E. 79 St., New York 21.)

11-13. Power Instrumentation, natl. symp., Kansas City, Mo. (H. H. Johnson, Consolidated Edison Co. of New York,

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13-16. Human Biochemical Genetics, Ciba Foundation symp., London England. (G. E. W. Wolstenholme, Ciba Foundation, 41 Portland Pl., London, W.1.)

14-15. Operations Research Soc. of America, Washington, D.C. (H. J. Miser, Rt. 2, Box 211, Vienna, Va.)

14-16. Acoustical Soc. of America, Ottawa, Canada. (W. Waterfall, 335 E. 45 St., New York 17.)

14-17. American Acad. of Dental Medicine, 13th annual, Atlantic City, N.J. (H. A. Lentz, 619 Main Ave., Passaic, N.J.)

14-16. American Assoc. of Physical Anthropologists, Madison, Wis. (E. E. Hunt, Jr., Peabody Museum, Harvard Univ., Cambridge 38, Mass.)

17-21. American Ceramic Soc., 61st annual, Chicago, Ill. (C. S. Pearce, ACS, 4055 N. High St., Columbus 14, Ohio.)

17-21. Institute of Food Technologists, 19th annual, Philadelphia, Pa. (C. S. Lawrence, IFT, 176 W. Adams St., Chicago 3, Ill.)

17-23. Antibiotics, intern. symp., Prague, Czechoslovakia. (M. Heřmanský, Antibiotics Research Inst., Roztoky near Prague, Czechoslovakia.)

17-23. Mass Spectrometry, 7th, Los Angeles, Calif. (A. G. Sharkey, Jr., U.S. Bureau of Mines, 4800 Forbes Ave., Pittsburgh 13, Pa.)

18-20. Instrumentation Methods of Analysis, 5th natl. symp., Houston, Tex. (H. S. Kindler, Director of Technical and

Educational Services, ISA, 313 Sixth Ave., Pittsburgh 22, Pa.)

19-23. American Assoc. of Mental Deficiency, Milwaukee, Wis. (N. A. Dayton, Mansfield State Training School & Hospital, Mansfield Depot, Conn.)

20-22. Education of the Scientist in a Free Society, conf., Milwaukee, Wis. (A. B. Drought, College of Engineering, Marquette Univ., 1515 W. Wisconsin Ave., Milwaukee 3.)

21-23. American Assoc. for the History of Medicine, 32nd annual, Cleveland, Ohio. (Miss E. H. Thomson, Yale Univ. School of Medicine, New Haven, Conn.)

21-27. Veterinary Cong., 16th intern., Madrid, Spain. (J. Jensen, General Secretary of Permanent Committee, Belstraat 168, Utrecht, Netherlands; or W. A. Hagan, Dean, Cornell Univ., New York State Veterinary College, Ithaca, N.Y.)

24-29. National Tuberculosis Assoc., Chicago, Ill. (Mrs. W. B. White, 1790 Broadway, New York 19.)

24-29. Social Welfare, natl. conf. and annual forum, San Francisco, Calif. (National Conference on Social Welfare, 22 W. Gay St., Columbus 15, Ohio.)

25-27. American Gynecological Soc., Hot Springs, Va. (A. A. Marchetti, 3800 Reservoir Rd., NW, Washington 7.)

25-27. American Soc. for Quality Control, Cleveland, Ohio. (L. S. Eichelberger, A. O. Smith Corp., Milwaukee, Wis.)

25-27. Chemical Inst. of Canada, 42nd annual conf., Halifax, Nova Scotia.

(Chemical Inst. of Canada, 18 Rideau St., Ottawa, Ontario, Canada.)

25-27. Telemetering, natl. conf., Denver, Colo. (R. Schmidt, AVCO Mfg. Co., 201 Lowell St., Wilmington, Mass.)

25-28. Smoking and Lung Cancer, and Pulmonary Emphysema, symps., American Trudeau Soc., Chicago, Ill. (H. W. Harris, Medical Sessions Committee, ATS, 1790 Broadway, New York 19.)

25-29. American College of Cardiology, 8th annual, Philadelphia, Pa. (P. Reichert, ACC, Empire State Bldg., New York 1.)

25-29. Transistors and Associated Semiconductor Devices, intern. conv., London, England. (Institution of Electrical Engineers, Savoy Pl., London, W.C.2.)

25-31. Electroheat, 4th intern. cong., Stresa, Italy. (International Union for Electroheat, 14, rue de Stäel, Paris 15^e.)

28-30. American Ophthalmological Soc., Hot Springs, Va. (M. C. Wheeler, 30 W. 59 St., New York 19.)

29-30. International Assoc. for Bronchology, 9th cong., Madrid, Spain. (J. Abello, IAB, Lagascar 13, Spain.)

30-5. Applications of Atomic Energy to the Petroleum Industry, symp., 5th World Petroleum Congress, New York, N.Y. (C. E. Davis, General Secretary, 5th World Petroleum Congress, 527 Madison Ave., New York 22.)

31-3. Special Libraries Assoc., 50th annual conv., Atlantic City, N.J. (Miss M. E. Lucius, 31 E. 10 St., New York 3.)

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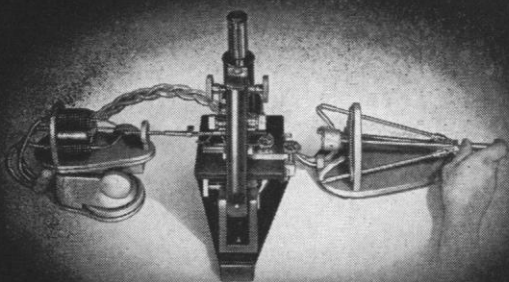
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