

System Theory

A system is a device which accepts inputs and then operates on them to produce outputs. Many disciplines are involved in developing system theories. In order to discuss the recent advances in this field, mathematicians, engineers, and physicists convened at an international symposium at the Polytechnic Institute of Brooklyn, New York (20-22 April).

The emergence of system theory from recent developments in the analysis of engineering systems, and the relation between this theory and classical mathematical studies were described by R. F. Drenick (Brooklyn Polytechnic Institute). Although engineering may pose problems whose solutions are most taxing to applied mathematics, it seems that engineering has progressed to some conceptual innovations and theories whose importance goes well beyond all possible practical applications. Studies of optimal engineering designs for communications and control systems spurred the growth of optimal control theory, filtering theory, and information theory. The present realm of system theory is roughly defined by the concepts and methods common to these theories, but its future development may be influenced by their intriguing differences.

Probability theory and random processes are essential ingredients in filtering theory, but meaningful and challenging control problems, as surveyed by L. W. Neustadt (University of Southern California), can be posed in purely deterministic terms. Recent developments in filtering theory and applications of it to significant engineering systems were presented by R. E. Kalman (Stanford), D. E. Johansen (Sylvania), and S. L. Fagin (Sperry Gyroscope Co.). The applications included computer data processing for orbit determination and adjustment of inertial navigations systems.

A probabilistic approach to systems containing uncertainties lead naturally to problems of system identification and construction of stochastic models. W. L. Root (University of Michigan) discussed the use of integral operators for representing time-invariant and time-varying systems in terms of their observable inputs and outputs. Model simplifications resulting from information-theoretic approximations were described by N. M. Abramson (University of California). An alternative approach to system uncertainties was

introduced by L. A. Zadeh (University of California) by using "fuzzy-system" concepts which are related to multi-valued logical systems.

Stability ideas possess all the traits of system theoretic concepts. Classical dynamical theory models were summarized by L. A. MacColl (Brooklyn Polytechnic Institute), and were brought to bear on recent stability results through recurrence principles by J. Auslander (Yale). Extensions from classical stability models have been inspired by optimal control theory. As an example of these new approaches, E. O. Roxin (University of Buenos Aires) presented results on stability properties which apply for sets of possible inputs. Finally, as reported by H. J. Kushner (Brown), some results are available for the even more complex stochastic systems.

Stability theory also acts as a provocative contrasting link between dynamical theory and discrete-state machine theory. Despite the similarities of the systems studied by these theories, stability does not seem to be a major consideration in discrete-state studies. Recent work in the latter area, as described by M. Davis (Yeshiva) and C. C. Elgot (I.B.M.), seems to have no counterpart in the former area.

Properties of causal systems, those whose outputs do not anticipate their inputs, are most fundamental to system theory. D. L. Hanson (University of Missouri) presented recent results related to the Wold decomposition problem; this problem asks if two random processes, with given statistics, can be the input and output, respectively, of a causal system. The results classify systems and processes in a manner which emphasizes distinctions between continuous and discrete-state systems. In related studies, R. Goodman (M.I.T.) has derived causal system results for equations of evolution which arise in relativistic quantum mechanics. He finds that equations describing massless particles generate nondeterministic systems, while equations describing particles of nonzero mass generate deterministic systems.

The engineering heritage of theory was portrayed by J. G. Truxal (Brooklyn Polytechnic Institute), who also indicated several current and challenging practical problems which may be solved eventually with the aid of future theoretical results. A plea for well-engineered research was delivered by R. Bellman (Rand Corp.), who called for the matching of researchers to prob-

lems for which they are suited and the choosing of meaningful problems rather than easy ones or those which are merely extensions of results of dubious value.

The symposium also included papers on economic and biological systems. Complete proceedings will be published in the fall of 1965.

This symposium, the fifteenth in an annual series, was organized by the Polytechnic Institute of Brooklyn in cooperation with the Information Theory, Circuit Theory, and Automatic Control Professional Groups of the Institute of Electrical and Electronics Engineers and the Society for Industrial and Applied Mathematics. The symposium was co-sponsored by the Air Force Office of Scientific Research, the Office of Naval Research, and the U.S. Army Research Office.

LEONARD SHAW

*Polytechnic Institute of Brooklyn,
Brooklyn 1, New York*

Forthcoming Events

September

1-3. American **Geophysical Union**, 5th western natl. meeting, Dallas, Tex. (AGU, 1145 19th St., NW, Washington, D.C.)

1-3. **Metallurgists**, 4th annual conf., Ottawa, Ont. (Canadian Inst. of Mining and Metallurgy, 906 Drummond Bldg., 117 St. Catherine St. W., Montreal, Que.)

1-3. Biomedical Aspects of **Shock and Vibration Technology**, symp., Denver, Colo. (E. R. Wilson, 5745 S. Huron St., Littleton, Colo. 80120)

1-4. **Aeronautics**, 6th European congr., Munich, Germany. (Wissenschaftliche Gesellschaft für Luft und Raumfahrt, Martinstr. 40-42, 5 Cologne)

1-4. International Assoc. of **Gerontology**, European Clinical section, 4th congr., San Remo, Italy. (A. Zilli, Viale Morgaglin 85, Florence, Italy)

1-4. **Immunological Methods**, symp., Chantilly, France. (R. H. Regamey, Intern. Assoc. of Microbiological Societies, Inst. d'Hygiene, 1200 Geneva, Switzerland)

1-4. Society of General **Physiologists**, 20th annual, Marine Biological Laboratory, Woods Hole, Mass. (R. Milkman, Dept. of Zoology, Syracuse Univ., Syracuse, N.Y. 13210)

1-5. **Regional Science Assoc.**, 5th European congr., Warsaw, Poland. (H. Wood, Dept. of Regional Science, Univ. of Pennsylvania, Philadelphia 19104)

1-8. **History of Pharmacy**, intern. congr., London, England. (A. L. Short, Pharmaceutical Soc. of Great Britain, 17 Bloomsbury Sq., London W.C.1)

1-9. **Physiological Sciences**, 23rd intern. congr., Tokyo, Japan. (G. Kato, Dept. of Physiology, Keio Univ. School of Medicine, Shinjuku-ku, Tokyo)

1-14. **Cosmical Gas Dynamics**, 5th

symp., Nice, France. (M. Roy, Intern. Union of Theoretical and Applied Mechanics, 55, boul. Malesherbes, Paris 8^e, France)

1-17. **Algebraic Number Theory**, international conf., Brighton, England. (R. R. Laxton, Mathematics Div., Physics Bldg., Univ. of Sussex, Brighton)

2-4. American **Physical Soc.**, Honolulu, Hawaii. (K. K. Darrow, APS, Columbia Univ., New York 10027)

2-5. International Medical Assoc. for the Study of **Living Conditions and Health**, 4th world congr., Karlovy Vary, Czechoslovakia. (Secretariat, Apolinárská 18, Prague 2)

2-9. German **Mineralogical Soc.**, 43rd, Hanover, Germany. (F. Buschendorf, Mineralogisches Inst., Technische Hochschule Hanover, Welfengarten 1, 3 Hanover)

3-7. American **Psychological Assoc.**, 73rd annual, Chicago, Ill. (The Association, 17th and Rhode Island Ave., NW, Washington, D.C.)

5-8. Federation of French-Speaking Societies of **Gynaecology and Obstetrics**, 21st congr., Lausanne, Switzerland. (P. Bloch, Hôpital Cantonal, Lausanne)

5-8. **Mathematics**, 7th Canadian congr., Quebec, Canada. (The Congress, 985 Sherbrook St. W., Montreal, Que.)

5-9. **Allergology**, 6th European congr., Stockholm, Sweden. (S. Kraepelin, Sachs Children's Hospital, Stockholm)

5-9. **Biochemistry of Lipids**, 9th intern. congr., Noordwijk, Netherlands. (J. Boldingh, Unilever Research Laboratorium, Mercatorweg 2, Vlaardingen, Netherlands)

5-9. **Luminescence**, symp., Munich, Germany. (N. Riehl, Arcisstr. 21, Munich)

5-9. International League Against **Rheumatism**, 11th congr., Buenos Aires, Argentina. (A. Caruso, Juncal 1875, Planta Baja, Depto. 2, Buenos Aires)

5-9. Physics and Chemistry of **Scintillators**, intern. luminescence symp., Munich, Germany. (H. Kallman, Radiation and Solid State Laboratory, Dept. of Physics, New York Univ., New York 3)

5-10. International Committee of **Electrochemical Thermodynamics and Kinetics**, 16th mtg., Budapest, Hungary. (S. Lengyel, ELTE Fizikai-Kemial es Radiologiai Tanszek, Puskin u. 11-13, Budapest 8)

5-10. **Electromyography**, intern. mtg., Vienna. (K. Pateisky, Universitäts Nerven-klinik, 14 Lazarettgasse, Vienna 9)

5-10. **Neurology**, 8th intern. congr., Vienna, Austria. (Congress Office, Vienna Academy of Medicine, Alserstr. 4, Vienna 9)

5-10. Ecology of **Soil Bacteria**, symp., Liverpool, England. (N. A. Burges, Univ. of Liverpool, Hartley Botanical Laboratories, Liverpool)

5-12. **Electroencephalography and Clinical Neurophysiology**, 6th intern. congr., Vienna, Austria. (M. A. B. Brazier, Brain Research Inst., Univ. of California Medical Center, Los Angeles 24)

5-14. **Fertility and Sterility**, 5th intern. congr., Madrid, Spain. (J. Ascenzo Aabello, Parque Meliton Porras, 161, Miraflores, Lima, Peru)

6-9. **Organosilicon Chemistry**, intern. symp., Prague, Czechoslovakia. (Inst. of Chemical Process Fundamentals, Prague-Suchbát 2)

6-9. **Thermal Analysis**, first intern. conf., Aberdeen, Scotland. (C. B. Murphy, Bldg. 5, General Electric Co., 1 River Rd., Schenectady, N.Y.)

6-10. **Embryology**, 7th intern. conf., Edinburgh, Scotland. (A. S. G. Curtis, Dept. of Zoology, University College London, Gower St., London W.C.1, England)

6-10. **Plasma Physics and Controlled Nuclear Fusion Research**, 2nd conf., Abingdon, England. (H. H. Storhaug, Div. of Scientific and Technical Information, Intern. Atomic Energy Agency, Kärntner Ring 11, Vienna 1, Austria)

6-10. European Organization for **Quality Control**, 9th conf., Rotterdam, Netherlands. (Secretariat, Weena 700, Rotterdam 3)

6-10. International Union of Directors of **Zoological Gardens**, annual, Berlin, Germany. (E. M. Lang, Zoologischer Garten, Basel, Switzerland)

6-11. **Electromagnetic Distance Measurement**, symp., London, England. (R. C. A. Edge, Field Survey, Ordnance Survey, Leatherhead Rd., Chessington, Surrey)

6-11. **Electromagnetic Wave Theory**, Intern. Scientific Radio Union, symp., Delft, Netherlands. (R. Timman, Technological Univ., Julianalaan 132, Delft)

6-11. **Polarization Phenomena of Nucleons**, 2nd intern. conf., Karlsruhe, Germany. (H. Schopper, Institut für Experimentelle Kernphysik, Kernforschungszentrum Karlsruhe, Postfach 947, 75 Karlsruhe)

6-11. Basic Problems in **Thin Film Physics**, intern. symp., Clausthal-Göttingen, Germany. (R. Nossek, Physikalisches Institut, Technische Hochschule, Clausthal)

6-12. International Soc. for Research on **Nutrition and Vital Substances**, Salzburg, Austria. (H. A. Schweigart, The Society, Bemeroderstr., 61, Hanover-Kirchrode, Germany)

6-12. **Photosynthesis**, Western European conf., Zeist, Netherlands. (J. C. Goedheer, Physica Inst., State Univ., Bijlhouwerstraat 6, Utrecht, Netherlands)

6-17. **Cosmic Rays**, 9th intern. conf., London, England. (C. J. Hutton, Physics Dept., Leeds Univ., Leeds 2, England)

6-17. **Equatorial Aeronomy**, 2nd intern. symp., Brazilian Space Commission, São José dos Campos, Brazil. (F. de Mendonça, Comissão Nacional de Atividades Espaciais, São José dos Campos)

6-17. **Laboratory Animal Husbandry**, symp., Dublin, Ireland. (M. L. Conalty, Medical Research Council Laboratories, Trinity College, Dublin 2)

7-9. **Electronic Materials**, conf., San Francisco, Calif. (American Inst. of Mining, Metallurgical, and Petroleum Engineers, 345 E. 47 St., New York 17)

7-9. Internal **Friction** in Solids, conf., Manchester, England. (G. M. Leak, Dept. of Metallurgy, Univ. of Manchester, Manchester 13)

7-9. **Minerals**, Soc. of Mining Engineers, fall mtg., Phoenix, Ariz. (American Inst. of Mining, Metallurgical and Petroleum Engineers, 345 E. 47 St., New York 17)

7-9. Biology of **Parasites of Veterinary Importance**, World Assoc. for the Advancement of Veterinary Parasitology, 2nd intern. conf., Univ. of Pennsylvania, Philadelphia. (S. M. Gaafar, Dept. of Veterinary Microbiology, Pathology, and Public

Health, Purdue Univ., Lafayette, Ind.)

7-10. **Virus and Vector on Perennial Hosts**, intern. conf., Davis, Calif. (B. Hewitt, Dept. of Plant Pathology, Univ. of California, Davis 95616)

7-14. **Acoustics**, 5th intern. congr., Liège, Belgium. (J. Frenkiel, 33 rue St.-Gilles, Liège)

8-10. **Automation** in Analytical Chemistry, intern. symp., New York, N.Y. (E. C. Whitehead, Technicon, Research Park, Chauncey, N.Y.)

8-10. **Biochemistry of Copper**, intern. symp., Harriman, N.Y. (J. Peisach, Dept. of Pharmacology, Albert Einstein College of Medicine, Yeshiva Univ., New York 61)

8-10. **Genetics** Soc. of America, Colorado State Univ., Fort Collins. (R. P. Wagner, Univ. of Texas, Austin)

8-10. **Magnet Technology**, intern. symp., Stanford Univ., Stanford, Calif. (R. H. Moulton, Jr., Stanford Linear Accelerator Center, P.O. Box 4349, Stanford Univ., Stanford)

8-10. International Organization for **Medical Physics**, first intern. conf., Harrogate, England. (Secretary, United Kingdom Natl. Committee for Medical Physics, 45/47 Little Britain, London E.C.1)

8-10. **Radiation Effects**, mtg., Asheville, N.C. (American Inst. of Mining, Metallurgical, and Petroleum Engineers, 345 E. 47 St., New York 17)

8-10. **X-Ray Optics and Microanalysis**, 4th intern. conf., Orsay, France. (Mr. Deschamps, Dept. of Physics, Institut de Recherches de la Siderurgie Française, St.-Germain-en-Laye, France)

8-11. **Biological Systems** at the Molecular Level, Naples, Italy. (R. C. Williams, Virus Laboratory, Univ. of California, Berkeley 94720)

8-11. **Biometric Soc.**, eastern North America region, Philadelphia, Pa. (E. L. LeClerc, 6804 40th Ave., University Park, Hyattsville, Md.)

8-11. Prevention of **Dental Caries**, symp., Prague, Czechoslovakia. (J. Kostlan, Vinohradska 48, Prague 2)

8-11. American **Political Science Assoc.**, Washington, D.C. (E. M. Kirkpatrick, 1726 Massachusetts Ave., NW, Washington)

8-11. American **Statistical Assoc.**, Philadelphia, Pa. (D. C. Riley, Univ. of Rochester, Rochester, N.Y.)

8-14. Ecology of **Aphic Parathyses**, symp., Prague, Czechoslovakia. (F. Hrabal, Foreign Relations Dept., Czechoslovak Acad. of Sciences, Narodni tr. 3, Prague 1)

8-15. **Nematology**, 8th intern. symp., Antibes, France. (M. P. Ritter, Station de Recherches sur les Nematodes, 123 boul. du Cap, Antibes, Alpes-Maritimes, France)

8-15. **Soil Mechanics**, 6th intern. conf., Montreal, Canada. (M. K. Ward, Natl. Research Council, Ottawa 2, Ontario)

9-11. French-speaking **Anatomopathologists**, 3rd congr., Quebec, Canada. (R. Ganeau, Dept. of Pathology, Hôpital du Saint-Sacrement, 150, Chemin Ste.-Foy, Quebec 6)

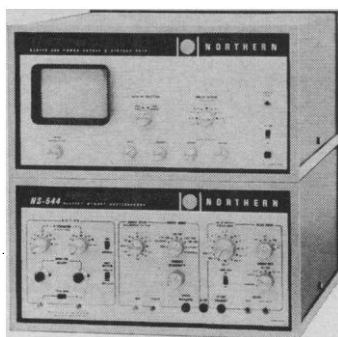
9-11. **Industrial Electronics and Control Instrumentation**, conf., Philadelphia, Pa. (L. Winner, 152 W. 42 St., New York 25)

9-11. **Parapsychological Assoc.**, 8th annual conv., New York, N.Y. (J. G. Pratt, Box 152, Univ. of Virginia Hospital, Charlottesville)

9-11. **Phlebology**, 2nd intern. congr.,

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Wiesbaden, Germany. (H. L. Biegeleisen, Phlebology Soc. of America, 155 E. 72 St., New York 10021)

9-12. Canadian Agricultural Chemicals Assoc., 13th annual, Banff, Alberta, Canada. (CACA, 3405 Code des Neiges Rd., Montreal 25, Que.)

9-12. Mass Spectrometry, Euechem conf., Sarlat, France. (Gesellschaft Deutscher Chemiker, Postfach 9075, 6 Frankfurt am Main, Germany)

9-13. Association of European Anesthetists, congr., Athens, Greece. (P. Mastracci, Centre de Transfusion Sanguine, Rue Delille, Nice, France)

9-13. International Soc. for Clinical Electroretinography, 4th symp., Tokyo, Japan. (A. Nakajama, Dept. of Ophthalmology, Juntendo Univ., Tokyo)

9-14. Econometric Soc., world congr., Rome, Italy. (L. R. Klein, Univ. of Pennsylvania, Philadelphia 19104)

10. Manned Space Stations, intern. symp., Munich, Germany. (German Soc. for Rocket Technology and Travel, Neuensteiner str. 19, Stuttgart-Zuffenhausen, Germany)

10-12. Comparative Neurophysiology, symp., Tokyo, Japan. (Yasuji Katsuki, Tokyo Medical and Dental Univ., 3-Chome, Yushima, Bunkyo-ku, Tokyo)

10-12. Structure and Function of the Limbic System, symp., Hakone, Japan. (T. Tokizane, Inst. of Brain Research, Univ. of Tokyo, Hongo, Tokyo, Japan)

11-12. Brain Edema, symp., Vienna, Austria. (F. Seitelberger, World Federation of Neurology, Schwarzspanierstr. 17, Vienna)

11-18. International Cardiovascular Soc., 7th congr., Philadelphia, Pa. (R. A. Deterling, Jr., 171 Harrison Ave., Boston, Mass. 02111)

11-18. Plant Environment in Glass-houses, symp., Bedfordshire, England. (Secretariat, P.O. Box 38, Wageningen, Netherlands)

11-18. International Soc. of Surgery, 21st congr., Philadelphia, Pa. (P. Martin, 43, rue des Champs-Elysees, Brussels 5, Belgium)

11-26. Chemistry in Industry and Agriculture, intern. conf., Moscow, U.S.S.R. (Central Office of Information, Reference Div., London, England)

12-15. International Assoc. of Milk, Food, and Environmental Sanitarians, Hartford, Conn. (H. L. Thomasson, P.O. Box 437, Shelbyville, Ind.)

12-17. International Aeronautic Federation, 58th annual general conf., Munich, Germany. (Natl. Aeronautic Federation, 1025 Connecticut Ave., NW., Washington, D.C. 20036)

12-17. American Chemical Soc., 150th annual, Atlantic City, N.J. (B. S. Baker, Inst. of Gas Technology, 3424 S. State St., Chicago, Ill. 60616)

12-17. Fracture, intern. conf., Sendai, Japan. (T. Yokobori, Dept. of Mechanical Engineering, Tohoku Univ., Sendai)

12-17. Highspeed Photography, 7th intern. conf., Zurich, Switzerland. (K. Pfister, Secretariat, Postfach 189, 8033 Zurich)

12-18. Astronautics, 16th intern. congr., Athens, Greece. (A. L. Jaumotte, Inst. de Mécanique Appliquée, Université Libre de Bruxelles, 50, avenue F. D. Roosevelt, Brussels, Belgium)



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12-18. **Radiology**, 10th Brazilian congr., first Portuguese-Brazilian congr., Rio de Janeiro, Brazil. (A. Arantes Pereira, Av. Churchill 97, S/508, Rio de Janeiro)

12-19. **Mechanisms of Viral Carcinogenesis**, symp., Rehovoth, Israel. (Weizman Inst., Rehovoth)

12-25. **Speleology**, 4th intern. congr., Ljubljana and other cities, Yugoslavia. (W. Bohinec, Titova 17a, Ljubljana)

13-15. **Drugs Affecting Lipid Metabolism**, 2nd intern. symp., Milan, Italy. (R. Paoletti, Inst. of Pharmacology, Univ. of Milan, Via Andrea del Sarto 21, Milan)

13-15. **Mechanism and Control of Gastric Secretion**, Univ. of Alberta, Edmonton, Alta., Canada. (Gastric Secretion Symp. Committee, Rm. C148, University Hospital, Edmonton)

13-15. **Association of French-Speaking Pediatricians**, 20th congr., Nancy, France. (Prof. Pierson, Hôpital General, Nancy)

13-16. **Cancer**, Latin American congr., Bogota, Colombia. (A. Buendia-Ferro, Avenida 1^a no. 9-85, Bogota)

13-16. **Optical Properties and Electronic Structure of Metals and Alloys**, intern., Paris, France. (F. Abelès, Institut d'Optique, 3 Boulevard Pasteur, Paris)

13-16. **Natural Mammalian Hibernation**, 3rd intern. symp., Univ. of Toronto, Ontario, Canada. (E. South, Jr., Dept. of Physiology, Colorado State Univ., Fort Collins)

13-17. **Environmental Physiology**, symp., Tokyo, Japan. (A. Nixon, Fed. of American Societies for Experimental Biology, 9650 Wisconsin Ave., Bethesda, Md.)

13-17. **Microwave Behavior of Ferromagnetics and Plasmas**, intern. conf., London, England. (P. J. B. Clarricoats, IEE, Savoy Pl., London W.C.2)

13-17. **Mother-Infant Interaction**, symp., CIBA Foundation, London, England. (CIBA, 41 Portland Pl., London W.1)

13-18. **Society of German Chemists**, general assembly, Bonn, Germany. (The Society, Postfach 9075, 6 Frankfurt am Main, Germany)

13-18. **International Gravimetric Commission**, mtg., Paris, France. (P. Tardi, Intern. Assoc. of Geodesy, 19 rue Auber, Paris 93)

13-18. **Electroanalysis of Organic and Inorganic Substances**, German Chemical Soc., Bonn, Germany. (W. Pfab, Homburg str. 10, 67 Ludwigshafen, Germany)

13-18. **French Speaking Psychiatrists and Neurologists**, 63rd congr., Lausanne, Switzerland. (P. Warot, 10 rue d'Esquermes, Lille, France)

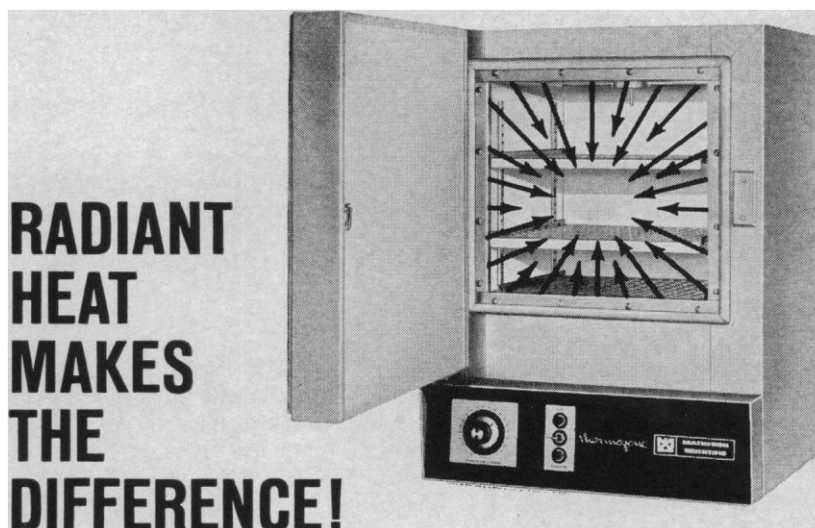
14-16. **Faraday Soc.**, mtg., Bristol, England. (The Society, 6 Gray's Inn Sq., London W.C.1)

14-17. **Theory of Self-adaptive Control Systems**, intern. symp., Teddington, England. (R. W. Wilde, Dept. of Electrical Engineering, Imperial College of Science and Technology, Exhibition Rd., London S.W.7)

14-20. **Hydrogeologists**, intern. congr., Hanover, Germany. (G. Castany, Intern. Assoc. of Hydrogeologists, 74, rue de la Federation, Paris 15^e, France)

14-20. **International Statistical Inst.**, 35th session, Belgrade, Yugoslavia. (The Institute, 2 Oostdijunlann, The Hague, Netherlands)

15-17. **Nuclear and Particle Physics**, conf., Univ. of Liverpool, England. (Inst.



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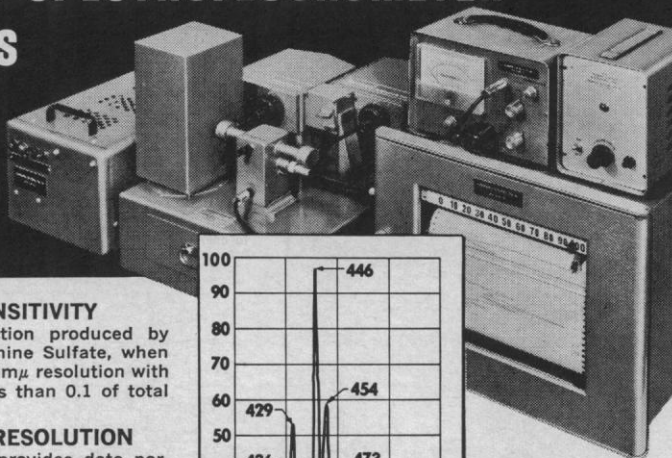
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of Physics and the Physical Soc., 47 Belgrave Sq., London S.W.1)

15-17. **Regional Science Assoc.**, 2nd Far East congr., Tokyo, Japan. (G. Konno, Faculty of Economics, Univ. of Tokyo)

15-17. **Urban Planning Information Systems and Programs**, Chicago, Ill. (American Soc. of Planning Officials, 1313 E. 60 St., Chicago 60637)

15-18. **Bacteriophagy**, 2nd intern. symp., Bucharest, Rumania. (Secretariat, Str. Progresului 10, Bucharest)

16-17. **Astrodynamics Specialist conf.**, Monterey, Calif. (V. Szebehely, Celestial Mechanics Research Center, Box 2034 Yale Station, New Haven, Conn. 06520)

16-17. **Production of Automation Elements**, conf., Esztergom, Hungary. (L. Prockl, Scientific Soc. of Mechanical Engineers, Szabadsag ter 17, Budapest 5)

16-18. **Marine Microbiology**, symp., Soc. for General Microbiology, Aberdeen, Scotland. (J. Shewan, Torry Research Station, Dept. of Scientific and Industrial Research, 135 Abbey Rd., Aberdeen)

16-19. **General Practice**, 7th intern. congr., Salzburg, Austria. (K. Englemeier, Intern. College of General Practice, Lange Str. 21a, 4740 Oelde, Westphalia, Germany)

16-19. **American Medical Writers Assoc.**, Detroit, Mich. (J. E. Bryan, 2000 P St., NW, Washington, D.C. 20036)

17. **Southern California Acad. of Science**, Los Angeles County Museum, Los Angeles. (C. Rozaire, Los Angeles County Museum, 900 Exposition Blvd., Los Angeles 90007)

17-18. **Dialysis and Transplant**, 2nd intern. conf., Newcastle, England. (W. Drukker, Dept. of Medicine, Queen Wilhelmina Hospital, Amsterdam W., Netherlands)

17-18. **British Tissue Culture Assoc.**, Manchester, England. (L. M. Franks, Imperial Cancer Research Fund, Lincoln's Inn Fields, London W.C.2)

18-19. **Minnesota Acad. of Science**, Grand Rapids. (V. E. Anderson, 6 Zoology, Univ. of Minnesota, Minneapolis 55455)

18-21. **International Soc. of Radiographers and Radiological Technicians**, 3rd world congr., Rome, Italy. (E. R. Hutchinson, 159 Gabalfa Ave., Cardiff, Wales)

19-22. **Dentology**, 5th Latin American congr., Buenos Aires, Argentina. (A. F. Alvarez, Argentine Odontological Assoc., Junin 959, Buenos Aires)

19-22. **Power**, natl. conf., Albany, N.Y. (Inst. of Electrical and Electronics Engineers, Box A, Lenox Hill Station, New York 10021)

19-23. **Cerebral Palsy**, Mediterranean symp., Rome, Italy. (Intern. Soc. for Rehabilitation of the Disabled, 701 First Ave., New York 10017)

19-25. **Greek Chemists Assoc.**, 3rd intern. meeting, Athens. (Dr. Parissakis, Technical Univ. of Athens, 42 Patission St., Athens)

19-25. **Elementary Particles**, 3rd intern. conf., Oxford, England. (R. C. Pepperell, Rutherford High Energy Laboratory, Chilton, Didcot, England)

19-25. **Immediate Separation and Chromatography**, intern., Athens, Greece.

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J944	2,2-Dimethyl-3-octanol, 'Baker' CH ₃ (CH ₂) ₄ CHOHC(CH ₃) ₂ FW 158.29 B.P. 88-91°C./20mm.	25 g. 11.50 100 g. 33.00
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M085	3-Ethyl-3-pentanol, 'Baker' (C ₂ H ₅) ₃ COH FW 116.20 B.P. 143-144°C.	25 g. 5.00 100 g. 15.75
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Q589*	3-Methyl-3-heptanol, 'Baker' CH ₃ (CH ₂) ₃ C(CH ₃)OHCH ₂ CH ₃ FW 130.23 B.P. 163-164°C.	25 g. 7.25 100 g. 23.20
Q590	4-Methyl-3-heptanol, 'Baker' CH ₃ (CH ₂) ₂ CH(CH ₃)CHOHCH ₂ CH ₃ FW 130.23 B.P. 75-77°C./20mm.	25 g. 9.00 100 g. 26.00
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Q855	2-Methyl-3-octanol, 'Baker' CH ₃ (CH ₂) ₄ CHOHCH(CH ₃) ₂ FW 144.26 B.P. 188-189°C.	25 g. 9.25 100 g. 28.00
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(G. Parissakis, Technical Univ. of Athens, Odos 28 Octovriou 42, Athens)

19-25. World Medical Assoc., 19th general assembly, London, England. (H. S. Gear, 10 Columbus Circle, New York 10019)

20. Organic Solid State, 3rd annual symp., Franklin Inst., Philadelphia, Pa. (M. M. Labes, Franklin Inst. Research Laboratories, Philadelphia 19103)

20. Photo-Electronic Image Devices as Aids to Scientific Observation, symp., London, England. (G. V. McGee, Dept. of Physics, Imperial College of Science and Technology, South Kensington, London S.W.7)

20-22. Glacier Mapping, symp., Ottawa, Ont., Canada. (Intern. Assoc. of Scientific Hydrology, 61 rue des Ronces, Gentbrugge, Belgium)

20-24. Biochemistry, 8th Latin meeting, Lisbon, Portugal. (S. F. Gomes da Costa, Laboratorio de Quimica Fisiologica, Faculdade de Medicina, Hospital de Santa Maria, Lisbon)

20-24. Burn Research, intern. congr., Edinburgh, Scotland. (A. Sutherland, Royal Hospital for Sick Children, Sciennes Rd., Edinburgh 9)

20-24. Fundamental Research, 3rd intern. symp., Cambridge, England. (H. W. Emerton, Reed Paper Group Ltd., Research and Development Centre, Aylesford, Maidstone, Kent, England)

20-24. International Council of Societies of Industrial Design, 4th general assembly and congr., Vienna, Austria. (Mrs. D. des Cressonieres, 70 Coudenberg, Brussels, Belgium)

20-24. Thermionic Electrical Power Generation, intern. conf., London, England. (Inst. of Electrical Engineers, Savoy Pl., London W.C.2)

20-27. Comparative and Cellular Pathology of Epilepsy, symp., Liblice, Czechoslovakia. (F. Hrabal, Foreign Relations Dept., Czechoslovak Academy of Sciences, Narodni tr. 3, Prague 1)

21-23. Chemurgic conf., Columbus, Ohio. (J. Ticknor, Chemurgic Council, 350 Fifth Ave., New York, N.Y.)

21-23. Fiber Soc., 25th mtg., Boston, Mass. (Box 625, Princeton, N.J.)

21-23. Magnetism, European conf., Vienna, Austria. (Verein Deutscher Eisenhüttenleute, Breit Str. 27, Düsseldorf, Germany)

21-23. Plasma Electromagnetics of Hypersonic Flight, 3rd symp., Boston and Bedford, Mass. (A. Cahill, Air Force Cambridge Research Laboratories, L. G. Hanscom Field, Bedford, Mass. 01731)

21-23. Touch, Heat, and Pain, CIBA symp., London, England. (CIBA, 41 Portland Pl., London W.1)

21-25. Propagation Factors in Space Communication, symp., Rome, Italy. (Lt. Col. E. F. Dukes, Advisory Group for Aeronautical Research and Development, 64 rue de Varenne, Paris 7, France)

22-24. Practice of Gas Chromatography, 4th annual mtg., St. Louis, Mo. (N. Brenner, Perkin-Elmer Corp., Main Ave., Norwalk, Conn.)

22-24. Canadian High Polymer Forum, 13th, Ottawa, Ont. (D. M. Wiles, Div. of Applied Chemistry, National Research Council, Ottawa)

22-24. Military Electronics, conf. (MIL-E-CON 9), Washington, D.C. (L. H. King,

Atlantic Research Corp., Shirley Hwy. at Edsall Rd., Alexandria, Va.)

22-24. American Soc. of **Photogrammetry**, 30th semiannual conv., Wright-Patterson AFB, Ohio. (A. J. Cannon, Research and Technology Div., Wright-Patterson AFB)

22-25. Committee of European **Acarologists**, symp., Milan, Italy. (G. Mathys, Stations Federales d'Essais Agricoles, Lausanne, Switzerland)

22-25. **Amblyopia Exanopsia**, intern. symp., Liège, Belgium. (R. Weekers, Clinique Ophthalmologique, Université de Liège, 66 blvd. de la Constitution, Liège)

22-25. British Assoc. for **Cancer Research**, annual, Dublin, Ireland. (J. G. Bennerre, Courtauld Inst., Middlesex Hospital, London W.1, England)

22-26. **Paläontologische Gesellschaft**, mtg., Zurich, Switzerland. (E. Kuhn-Schnyder, Paläontologisches Institut d. Univ. Zurich, Künstlergasse 16, 8006, Zurich)

22-28. **Radiology**, 11th intern. congr., Rome, Italy. (Secretariat, Via Reno 21, Rome)

23-25. French **Medical Congr.**, Paris, France. (M. Bricaire, 40 rue Scheffer, Paris 16)

23-25. Society of the **Plastics Industry**, New England sect., 21st annual, Groton, Conn. (The Society, 250 Park Ave., New York 10017)

23-26. **Mycology**, tripartite conf., Germany, Austria, Switzerland; Klagenfurt, Austria. (Austrian Mycology Soc., Postfach 200, Vienna 1)

23-28. **Electronics and Vacuum Physics**, 3rd Czechoslovak conf., Prague, Czechoslovakia. (Organizing Committee, Ke Karlovu 5, Dept. of Electronics and Vacuum Physics, Prague 2)

24-25. **Communications**, 13th conf., Cedar Rapids, Iowa. (Inst. of Electrical and Electronics Engineers, Box A, Lenox Hill Station, New York 21)

25-30. International Soc. of **Nephrology**, 3rd intern. congr., Washington, D.C. (Secretariat, 9650 Wisconsin Ave., Washington, D.C. 20014)

26-29. American Inst. of **Chemical Engineers**, 57th natl., Minneapolis, Minn. (AIChE, 345 E. 47 St., New York 10017)

27. Society for **Pediatric Radiology**, Washington, D.C. (J. L. Gwinn, Children's Hospital, 4614 Sunset Blvd., Los Angeles, Calif.)

27-29. Chemistry of the **Solvent Extraction of Metals**, intern. conf., Atomic Energy Research Establishment, Harwell, England. (F. K. Pyne, B. 329, Harwell)

27-1. **Community Oral Health**, hemispheric conf., San Juan, P.R. (N. O. Harris, School of Dentistry, Univ. of Puerto Rico, San Juan 00905)

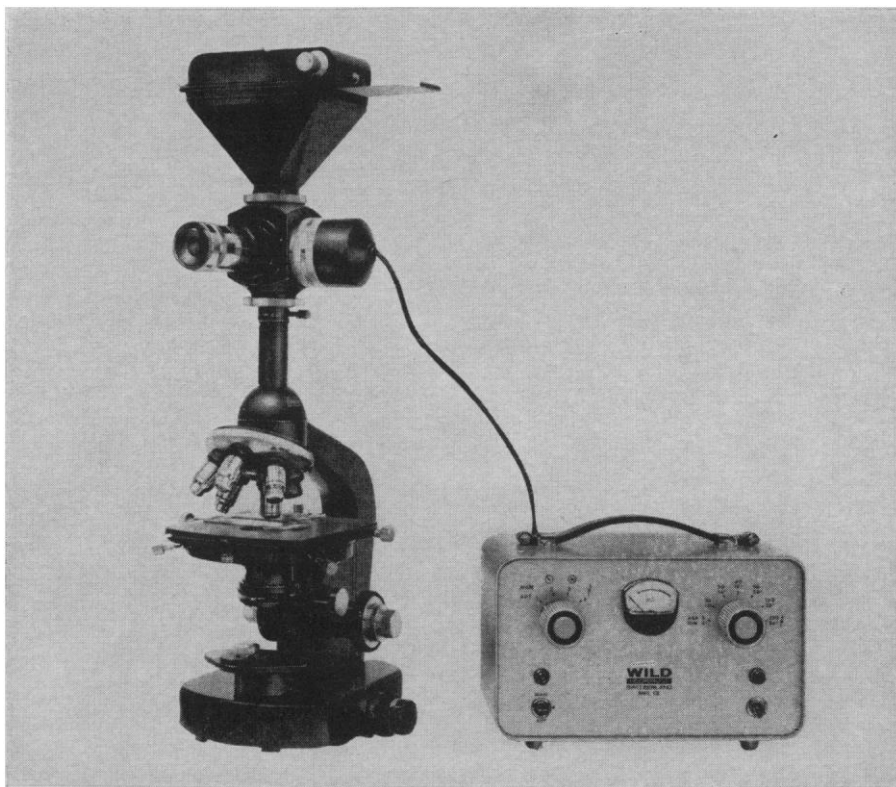
27-1. **Urology**, French congr., Paris, France. (J. Michon, French Assoc. of Urology, 47, boul. des Invalides, Paris 7)

28. Society of Austrian **Chemists**, general assembly, Graz, Austria. (The Society, Eschenbachgasse 9, Vienna 1)

28-29. **Electric Heating**, 7th biennial conf., Cleveland, Ohio. (A. F. Leatherman, Battelle Memorial Inst., 505 King Ave., Columbus, Ohio 43201)

28-30. German Soc. for **Documentation**, 17th annual, Constance, Germany. (The Society, Schubertstr. 1, Frankfurt am Main, Germany)

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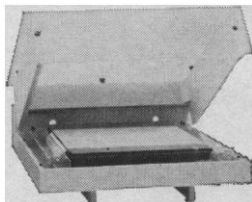
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28-30. **Physics and Nondestructive Testing**, symp., Dayton, Ohio. (D. W. J. McGonnagle, IIT Research Inst., 10 W. 35 St., Chicago, Ill. 60616)

28-30. **Industrial and Commercial Power Systems**, conf., Buffalo, N.Y. (J. A. Hart, Allison Div., General Motors Corp., Box 894, Indianapolis 6, Ind.)

28-1. **Experimental Mechanics**, 2nd intern. congr., Washington, D.C. (J. L. Jones, Soc. for Experimental Stress Analysis, 21 Bridge Sq., Westport, Conn. 06880)

28-1. **Society for Experimental Stress Analysis**, Washington, D.C. (B. E. Rossi, 21 Bridge Sq., Westport, Conn.)

28-1. **Inhaled Particles and Vapors**, Cambridge, England. (J. S. McLintock, Medical Service, Natl. Coal Board, Hobart House, Grosvenor Pl., London S.W.1)

28-1. **Medical Electronics**, European symp., Brighton, England. (J. Pearce, 4 Mill St., London W.1)

28-2. **Hyperpure Materials** in Science and Technology, Inst. for Applied Physics of Hyperpure Materials, Dresden, Germany. (The Institute, Dresden A 20, Winterbergstr. 28, East Germany)

29-1. **Analytical Chemistry**, symp., Graz, Austria. (Prof. Gutmann, Austrian Assoc. for Microchemistry and Analytical Chemistry, Eschenbachgasse 9, Vienna 1)

29-1. **European Atomic Forum**, 2nd congr., Frankfurt am Main, Germany. (European Atomic Energy Forum, 26, rue de Clichy, Paris 9)

29-1. **German Soc. for Aviation and Space Medicine**, intern. congr., Munich, Germany. (H. von Diringshofen, German Soc. for Aviation and Space Medicine, Silcherstr. 6, Munich 13)

29-1. **American Vacuum Soc.**, 12th annual symp., New York, N.Y. (R. L. Jepsen, Varian Associates, 611 Hansen Way, Palo Alto, Calif.)

October

1-3. **French-Language Assoc. of Scientific Psychology**, 10th study sessions, Marseilles, France. (P. Fraisse, The Association, Inst. de Psychologie, 28, rue Serpente, Paris 6)

1-11. **International Scientific Film Assoc.**, 19th annual congr., Bucharest, Rumania. (ISFA, 38, avenue des Termes, Paris 17, France)

2. **Association of Clinical Biochemists**, annual, London, England. (D. W. Moss, Postgraduate Medical School, Ducane Rd., London, W.12)

3-5. **Refractory Metals**, 4th symp., French Lick, Ind. (J. Maltz, Materials Research Div., NASA, 600 Independence Ave., SW, Washington, D.C. 20546)

3-7. **American Phytopathological Soc.**, Miami Beach, Fla. (J. R. Shay, Dept. of Botany and Plant Pathology, Purdue Univ., Lafayette, Ind.)

3-8. **Clinical Pathology**, 6th intern. congr., Rome, Italy. (B. L. Della Vida, Via de'Penitenzieri 13, Rome)

3-9. **Water Desalination**, 1st intern. symp., Washington, D.C. (Atomic Industrial Forum, 850 Third Ave., New York 10022)

4-5. **Enzyme Regulation**, 4th intern. symp., Indiana Univ., Indianapolis. (G. Weber, Indiana Univ. School of Medicine, Indianapolis 46207)

4-5. **Physical Metallurgy of Refractory Metals**, conf., American Inst. of Mining, Metallurgical, and Petroleum Engineers, French Lick, Ind. (AIME, 345 E. 47 St., New York 10017)

4-6. **Electronics**, Canadian conf., Toronto, Ont. (W. M. Lower, 1819 Yonge St., Toronto)

4-6. **Industrial Organic Analysis**, Analytical Chemistry Div., Chemical Inst. of Canada, Sarnia, Ont. (R. M. Small, Research Dept., Polymer Corp, Sarnia)

4-6. **International Scientific Radio Union/Inst. of Electrical and Electronics Engineers**, fall meeting, Dartmouth College, Hanover, N.H. (IEEE, Box A, Lenox Hill Station, New York, N.Y.)

4-7. **Instrument-Automation Conf.**, Los Angeles, Calif. (E. M. Grabbe, Instrument Soc. of America, 530 William Penn Pl., Pittsburgh, Pa. 15219)

4-7. **Otorhinolaryngology**, 62nd French congr., Paris, France. (H. Guillon, 6, avenue Mac-Mahon, Paris 16)

4-7. **Research Equipment**, exhibit and instrument symp., 15th annual, Bethesda, Md. (J. B. Davis, Natl. Institutes of Health, Bethesda, Md. 20014)

4-7. **International Committee for Social Sciences Documentation**, annual plenary assembly, Budapest, Hungary. (J. Meyriat, 27, rue St. Guillaume, Paris 7)

4-8. **Aeronautic and Space Engineering**, Soc. of Automotive Engineers, Los Angeles, Calif. (C. C. King, SAE Western Branch, 999 North Sepulveda Blvd., El Segundo, Calif. 90245)

4-8. **Ciba Foundation Clinical Research Guest Conf.**, London, England. (Ciba, 41 Portland Pl., London W.1)

4-10. **Physicists**, conf., Frankfurt am Main, Germany. (G. Schubert, Inst. für Theoretische Physik, Universität, Mainz, Germany)

4-13. **International Council for the Exploration of the Sea**, 53rd annual meeting, Rome, Italy. (The Council, Charlottenlund Slot, Charlottenlund, Denmark)

4-13. **Commonwealth Medical Conf.**, Edinburgh, Scotland. (Mrs. J. Hotchkiss, Ministry of Overseas Development, Eland House, Stag Place, London, S.W.1, England)

5-7. **Industrial and Commercial Power Systems**, conf., Buffalo, N.Y. (T. O. Zittel, Bethlehem Steel Co., 3555 Lake Shore Rd., Buffalo 14219)

5-8. **International Committee of Weights and Measures**, session, Sèvres, France. (Intern. Bureau of Weights and Measures, Pavillon de Breteuil, Sèvres, Sein-et-Oise, France)

5-9. **Infectious Pathology**, 4th intern. congr., Freiburg im Breisgau, Germany. (G. Mossner, Hugertstr. 55, Freiburg im Breisgau)

5-9. **Tuberculosis**, 18th intern. conf., Munich, Germany. (Intern. Union Against Tuberculosis, 15, rue Pomereu, Paris 16, France)

6-8. **Dynamics of Fluids and Plasmas**, symp., Univ. of Maryland, College Park. (S. I. Pai, Inst. for Fluid Dynamics and Applied Mathematics, Univ. of Maryland, College Park 20742)

6-8. **Optical Soc. of America**, annual meeting, Philadelphia, Pa. (M. E. Wurga, OSA, 1155 16th St., NW, Washington, D.C. 20036)

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6-8. Royal Inst. of **Public Health and Hygiene**, annual conf., Weymouth, Eng-
land. (Secretary, RIPHH, 28 Portland
Place, London, W.1, England)

6-10. **Wood and Organisms**, intern.
symp., Berlin, Germany. (German Soc.
for Wood Research, Danneckerstr. 37,
Stuttgart S, Germany)

7-9. **Seismological** Soc. of America,
eastern sec. 37th annual, Lamont Geolog-
ical Observatory, Palisades, N.Y. (J. Dor-
man, Lamont Geological Observatory,
Palisades 10964)

8-9. **Atlantic Coastal Plain Geological**
Assoc., field trip, South Carolina. (D. J.
Colquhoun, Dept. of Geology, Univ. of
South Carolina, Columbia)

8-9. Association of **Midwestern College**
Biology Teachers, 9th annual conf.,
Northern Illinois Univ., DeKalb)

8-9. **Indiana** Acad. of Science, fall
meeting, Notre Dame. (C. F. Dineen, St.
Mary's College, Notre Dame)

9. **Paleontological Research** Inst., Ith-
aca, N.Y. (K. V. W. Palmer, Paleontolog-
ical Research Inst., 109 Dearborn Pl.,
Ithaca)

9-10. **Gastroenterology**, French conf.,
Paris, France. (R. Biguic, 79, Boulevard
Malesherbes, Paris 8°)

9-13. American Soc. of **Clinical Hyp-**
nosis, Chicago, Ill. (F. D. Nowlin, ASCH,
800 Washington Ave., SE, Minneapolis,
Minn. 55414)

9-17. Electrical, Electronics, and Mech-
anical **Engineering**, first Pan American
congr., Mexico, D.F. (Inst. of Electrical
and Electronics Engineers, Box A, Lenox
Hill Station, New York 10021)

10-14. **Water Pollution Control** Fed.,
38th annual, Atlantic City, N.J. (R. E.
Fuhrman, 4435 Wisconsin Ave., NW,
Washington, D.C. 20016)

10-15. International Federation for
Documentation, congr., Washington, D.C.
(Secretariat, FID, 9650 Wisconsin Ave.,
Washington 20014)

10-15. **Electrochemical** Soc., meeting,
Buffalo, N.Y. (Executive Secretary, ES, 30
E. 42 St., New York 10017)

10-15. **Endocrinology**, 6th Pan Amer-
ican conf., Mexico, D.F. (G. Gual, Inst.
Nacional de la Nutrición, Dr. Jimenez
No. 261, Mexico 7)

10-16. American **Documentation** Inst.,
Washington, D.C. (J. E. Bryan, 2000 P
St., NW, Washington, D.C. 20036)

10-17. **Bronchoesophagology**, 1st Latin
American congr., Rio de Janeiro, Brazil.
(F. Aprigliano, Rua Alcindo Guanabara,
24, Sob-Loja 206, Rio de Janeiro)

10-17. **Otorhinolaryngology**, 14th Bra-
zilian congr., Rio de Janeiro, Brazil. (W.
Benevides, Rua Alcindo Guanabara, 24,
Sob-Loja 206, Rio de Janeiro)

10-17. **Plastic Surgery**, 10th Latin
American congr., Buenos Aires, Argenti-
na. (J. Norberto Spera, Riglos 624,
Buenos Aires)

11-13. **Color Centers in Alkali Halides**,
symp., Univ. of Illinois, Urbana. (D. W.
Compton, Dept. of Physics, Univ. of
Illinois, Urbana)

11-13. **Communications**, 11th natl.
symp., Utica, N.Y. (G. E. Brunette, Com-
munications Div. (EMCT) Rome Air De-
velopment Center, Griffiss AFB, New
York 13442)

11-13. Metabolic Roles of **Lipids**,
symp., Cincinnati, Ohio. (C. H. Hauber,

American Oil Chemists' Soc., 35 East
Wacker Dr., Chicago 1, Ill.)

11-13. **Manned Spaceflight**, 4th meet-
ing, St. Louis, Mo. (J. F. Yardley, McDon-
nell Aircraft Corp., P.O. Box 516, St.
Louis)

11-13. **National Acad. of Sciences**, fall
meeting, Univ. of Washington, Seattle.
(H. Neurath, Dept. of Biochemistry, Univ.
of Washington, Seattle 98105)

11-13. American **Record Management**
Assoc., 10th annual conf., Minneapolis,
Minn. (L. Loveless, Office Services, Honey-
well, Inc., 2701 Fourth Ave., S, Minneapo-
lis 55408)

11-14. Association of **Official Agri-**
cultural Chemists, 79th annual, Washing-
ton, D.C. (L. G. Ensminger, AOAC, Box
540, Benjamin Franklin Station, Wash-
ington 20044)

11-14. American **Oil Chemists' Soc.**, fall
meeting, Cincinnati, Ohio. (AOCS, 35 E.
Wacker Dr., Chicago, Ill. 60600)

11-15. Fall **Metallurgy** Days, Paris,
France. (Soc. Française de Metallurgie,
25 rue de Clichy, Paris 9°)

11-16. **Stomatology**, 19th French congr.,
Paris. (R. Cayron, 99, rue de Courcelles,
Paris 17°)

11-23. International Organization for
Standardization, Milan, Italy. (Soc. of Mo-
tion Picture and Television Engineers, 9
E. 41 St., New York 10017)

12-13. **Cardio-Renal Consequences of**
Sustained Hypertension, seminar, Phila-
delphia, Pa. (Miss S. Rosen, Symposium
Office, Hahnemann Medical College and
Hospital, 230 N. Broad St., Philadelphia
19102)

12-14. **Analytical Chemistry in Nuclear**
Technology, 9th conf., Gatlinburg, Tenn.
(C. D. Susano, Oak Ridge Natl. Labora-
tory, P.O. Box X, Oak Ridge, Tenn.
37831)

12-16. **Communications**, 13th intern.
congr., Genoa, Italy. (Inst. for Intern.
Communications, Viale Brigate Partigiane,
18, Genoa)

13. **Medical Physics**, seminar, New
York, N.Y. (American Inst. of Physics,
335 E. 45 St., New York 10017)

13. **Animal Nutrition Research** Council,
26th annual, Washington, D.C. (J. C.
Fritz, 12314 Madeley Lane, Bowie, Md.
20715)

13-15. **Detonation**, 4th symp., White
Oak, Silver Spring, Md. (S. J. Jacobs,
U.S. Naval Ordnance Laboratory, White
Oak, Silver Spring 20910)

13-15. American Assoc. of **Petroleum**
Geologists, mid-continent regional meet-
ing, Tulsa, Okla. (E. W. Ellsworth, AAPG,
Box 979, Tulsa 74101)

13-16. **Tau Beta Pi** Assoc., Inc., Univ.
of Maryland, College Park. (R. H. Nagel,
508 Dougherty Engineering Bldg., Univ.
of Tennessee, Knoxville)

13-17. **Soil Biology**, first Latin Ameri-
can colloquium, Bahia Blanca, Argentina.
(Organizing Committee, Inst. de Edafologia
e Hidrologia, Alem 925, Bahia Blanca,
Argentina)

13-19. **Instrumentation and Automa-**
tion, 3rd intern. congr., Düsseldorf, Ger-
many. (Nordwestdeutsche Ausstellungs-
und-Messe-Gesellschaft, Ehrenhof 4, 4000
Düsseldorf 10)

14. Association of **Vitamin Chemists**,
Chicago, Ill. (D. Olson, Dawe's Labora-
tories, 4800 S. Richmond St., Chicago)

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14-15. International Federation of **Surgical Colleges**, 8th annual, Philadelphia, Pa.; 17, Atlantic City, N.J. (K. Cassels, Royal College of Surgeons, Lincoln's Inn Fields, London W.C.2, England)

14-16. British **Orthopaedic Assoc.**, fall meeting, London, England. (Joint Secretariat, 47 Lincoln's Inn Fields, London, W.C.2)

15. **Southern California Acad. of Science**, Los Angeles. (C. Rozaire, Los Angeles County Museum, 900 Exposition Blvd., Los Angeles 90007)

15-16. Contributions of Cytogenetics to the **Determination of Phylogenies**, 12th symp., Missouri Botanical Garden, St. Louis. (H. C. Cutler, Missouri Botanical Garden, St. Louis 63110)

15-16. National Soc. of **Professional Engineers**, 3rd annual conf., Oklahoma City, Okla. (NSPE, 2029 K St., NW, Washington 20006)

15-17. American **Heart Assoc.**, Scientific sessions, Bal Harbour, Fla. (AHA, 44 E. 23 St., New York 10010)

16-17. **Infectious Diseases Soc. of America**, Washington, D.C. (E. H. Kass, IDS, Boston City Hospital, Boston, Mass. 02118)

17-21. **Antimicrobial Agents and Chemotherapy**, 5th interscience conf./4th intern. congr. of chemotherapy, Washington, D.C. (R. W. Sarber, American Soc. for Microbiology, 115 Huron View Blvd., Ann Arbor, Mich.)

17-21. **Metallurgical Soc. of American Inst. of Mining, Metallurgical, and Petroleum Engineers**, Detroit, Mich. (AIME, 345 E. 47 St., New York 10017)

18. **Industrial Pharmacy** sect., American Pharmaceutical Assoc., 4th annual mid-west regional meeting, Chicago, Ill. (C. Schroeter, Abbott Laboratories, North Chicago, Ill.)

18-19. American Inst. of **Aeronautics and Astronautics/Canadian Aeronautics and Space Inst.**, Toronto, Ont., Canada. (D. L. Raymond, 1290 Sixth Ave., New York 10019)

18-19. **Systems Science**, conf., Case Inst. of Technology, Cleveland, Ohio. (Inst. of Electrical and Electronics Engineers, Box A, Lenox Hill Station, New York 10021)

18-20. **Dynamic Stability of Structures**, intern. conf., Evanston, Ill. (G. Herrmann, Technological Inst., Northwestern Univ., Evanston 60201)

18-20. **Electromagnetic Radiation in Agriculture**, intern. conf., Roanoke, Va. (D. P. Brown, Niagara Mohawk Power Corp., 300 Erie Blvd. W., Syracuse, N.Y. 13202)

18-20. American Soc. of **Lubrication Engineers**, San Francisco, Calif. (D. B. Sanberg, 5 N. Wabash Ave., Chicago, Ill.)

18-20. Canadian Inst. of **Mining and Metallurgy**, annual western meeting, Winnipeg, Canada. (CIMM, 906 Drummond Bldg., 1117 St. Catherine St. W., Montreal 2, P.Q., Canada)

18-20. **Nuclear Science**, 12th symp., San Francisco, Calif. (Inst. of Electrical and Electronics Engineers, Box A, Lenox Hill Station, New York 10021)

18-20. Applied **Spectroscopy**, 12th symp., Ottawa, Ont., Canada. (R. V. Baker, Aluminum Co. of Canada, Arvida, P.Q., Canada)

18-21. Advances in **Gas Chromatog-**

raphy, 3rd intern. symp., Houston, Tex. (A. Zlatkis, Dept. of Chemistry, Univ. of Houston, Houston)

18-21. **Management Information and Data Transfer Systems**, American Univ., Washington, D.C. (R. I. Cole, Center for Technology and Administration, American Univ., 2000 G St., NW, Washington, D.C. 20006)

18-22. American Soc. of **Civil Engineers**, Kansas City, Mo. (W. H. Wisely, ASCE, 345 E. 47 St., New York 10017)

18-22. Society for **Nondestructive Testing**, 25th natl. conv., Detroit, Mich. (N. H. Cale, Anaconda American Brass Co., Research and Technical Center, P.O. Box 747, Waterbury, Conn.)

18-22. American **Public Health Assoc.**, 93rd annual, Chicago, Ill. (APHA, 1790 Broadway, New York, N.Y.)

18-22. **Radioisotope Instruments in Industry and Geophysics**, Warsaw, Poland. (J. H. Kane, Div. of Special Projects, U.S. Atomic Energy Commission, Washington, D.C.)

18-22. American Soc. for **Metals**, natl. congr., Detroit, Mich. (A. R. Putnam, ASM, Metals Park, Ohio)

18-22. Application of **Radioisotopes in Gastroenterology**, symp., Lausanne, Switzerland. (A. Vannotti, Clinique Médicale Universitaire, Hôpital Cantonal, Lausanne)

18-22. American College of **Surgeons**, annual clinical congr., Atlantic City, N.J. (American College of Surgeons, 55 East Erie St., Chicago, Ill. 60611)

19-20. International **Rhinologic Soc.**, 1st congr., Kyoto, Japan. (H. A. E. van Dishoeck, Academisch Ziekenhuis, Leiden, Netherlands)

19-21. Association of **Analytical Chemists**, 13th conf., Detroit, Mich. (G. Schenk, Dept. of Chemistry, Wayne State Univ., Detroit 48202)

19-21. **Cloud Physics and Severe Storms**, conf., American Meteorological Soc., Reno, Nev. (K. C. Spengler, 45 Beacon St., Boston 8, Mass.)

19-21. Radio Astronomical and Satellite **Studies of the Atmosphere**, 2nd symp., Boston, Mass. (G. A. Cushman, Wentworth Inst., 550 Huntington Ave., Boston)

19-22. Economics of **Automatic Data Processing**, symp., Rome, Italy. (Intern. Computation Center, Viale della Civiltà del Lavoro, 23, P.O.B. 10053, Rome)

20-21. **Airborne Infection**, 2nd intern. symp., Johns Hopkins School of Medicine, Baltimore, Md. (E. K. Wolfe, Fort Detrick, Frederick, Md. 21701)

20-21. International Soc. of **Audiology**, 2nd congr., Kyoto, Japan. (M. Goto, Dept. of Otolaryngology, Kyoto Univ., Shogoin, Sakyo-ku, Kyoto)

20-22. **Circuit and System Theory**, Allerton Conf., Univ. of Illinois, Monticello. (M. E. Van Valkenburg, Dept. of Electrical Engineering, Univ. of Illinois, Urbana 61803)

20-22. **Design of Experiments**, 11th conf., Hoboken, N.J. (F. G. Dressel, Army Research Office-Durham, Box CM, Duke Station, Durham, N.C. 27706)

20-22. **Parenteral Drug Assoc.**, annual conv., New York, N.Y. (PDA, Western Saving Fund Bldg., Broad and Chestnut St., Philadelphia, Pa. 19107)

21. **New Mexico Acad. of Science**, Albuquerque. (K. S. Bergstresser, 739 42nd St., Los Alamos, N.M.)

21-22. **Copolymer** conf., Ludwigshafen, Germany. (Deutsche Bunsen-Gesellschaft für Physikalische Chemie, Varrentrappstr. 40-42, 6 Frankfurt am Main, Germany)

21-22. **Electrochemical Current Sources**, symp., Frankfurt am Main, Germany. (Gesellschaft Deutscher Chemiker, Postfach 9075, 6 Frankfurt am Main)

21-23. **Microminiaturization in Automatic Control**, symp., Munich, Germany. (G. Müller, Siemens & Halske AG, Wernerwerk für Messtechnik, Postfach 834, Karlsruhe, Germany)

21-23. Society of **Photographic Scientists and Engineers**, symp., Washington, D.C. (W. S. Dempsey, Houston Fearless Corp., 1413 K St., NW, Washington 20005)

22-23. **Data Processing** in Public Libraries, conf., Drexel Inst. of Technology, Philadelphia, Pa. (M. D. Warrington, Graduate School of Library Science, Drexel Inst. of Technology, Philadelphia 19104)

23-28. American Acad. of **Pediatrics**, annual, Chicago, Ill. (R. G. Frazier, AAP, 1801 Hinman Ave., Evanston, Ill. 60204)

24-27. Society of American **Foresters**, annual, Detroit, Mich. (Society of American Foresters, 1010 16th St., NW, Washington 20036)

24-29. **Stable Isotopes**, 4th symp., Leipzig, East Germany. (Inst. für Stabile Isotope, Deutsche Akademie der Wissenschaften, Permoserstr. 15, 705 Leipzig)

24-30. American College of **Gastroenterology**, Bal Harbour, Fla. (D. Weiss, 33 W. 60 St., New York 10023)

25-27. **Chemical Engineering**, 15th conf., Quebec, Que., Canada. (Chemical Inst. of Canada, 48 Rideau St., Ottawa 2, Ont.)

25-27. Functional Organization of the **Compound Eye**, symp., Karolinska Inst., Stockholm, Sweden. (W. E. Savely, Air Force Office of Scientific Research, Washington, D.C. 20333)

25-27. **Electrical Insulation**, Natl. Acad. of Sciences-Nat. Research Council conf., Buck Hill Falls, Pa. (D. W. Thornhill, NAS, 2101 Constitution Ave., NW, Washington, D.C.)

25-27. **Electronics**, natl. conf., Chicago, Ill. (R. G. Brown, Dept. of Electrical Engineering, Iowa State Univ., Ames 50010)

25-27. **Nuclear and Engineering Ceramics**, conf., Harwell, England. (G. H. Stewart, British Ceramic Soc., Shelton House, Shelton, Stoke-on-Trent, England)

25-27. Society of **Rheology**, Case Inst. of Technology, Cleveland, Ohio. (J. C. Miller, Union Carbide Plastics Co., Bound Brook, N.J.)

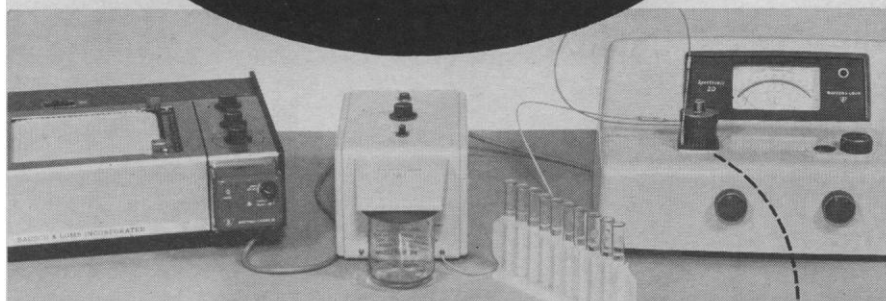
25-29. **Hypotensive Polypeptides**, intern. symp., Florence, Italy. (E. G. Erdös, Dept. of Pharmacology, Univ. of Oklahoma Medical Center, Oklahoma City 73104)

26. American Soc. of **Safety Engineers**, annual, Chicago, Ill. (A. C. Blackman, ASSE, 5 N. Wabash, Chicago, Ill.)

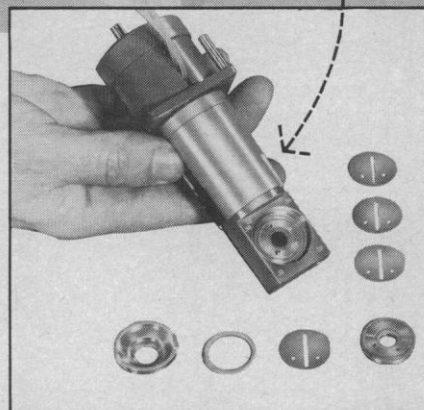
26-28. **Fluid Amplification**, symp., Washington, D.C. (J. M. Kirschner, Fluid Systems Branch, Harry Diamond Laboratories, Washington 20438)

26-28. **Shock and Vibration**, 25th symp., New Orleans, La. (Shock and Vibration Information Center, Code 4021, U.S. Naval Research Laboratory, Washington, D.C. 20390)

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