

identification of noradrenaline as the sympathetic neurotransmitter substance. The subsequent sessions attest to the remarkable advances which have taken place in the short period of time since the last symposium. Most of the details concerning the enzymology of catecholamine biosynthesis were not known in 1958, and the presentations of H. Blaschko, S. Udenfriend, T. Sourkes, S. Kaufman, O. Hayaishi, M. Goldstein, and C. E. Sekeris summarized clearly the advances made. These advances include isolation and characterization of tyrosine hydroxylase and dopamine- β -hydroxylase and studies on the enzyme mechanisms. Direct evidence was also presented that tyrosine hydroxylase limits the rate of norepinephrine production. Details of the enzymes monoamine oxidase and catechol *O*-methyl-transferase, which are responsible for the metabolism of the catecholamines, were elegantly summarized by P. Holtz, J. Axelrod, V. Gorkin, A. Pletscher, and B. Belleau.

Mechanisms related to the interaction of catecholamine with the enzymes and cofactors involved in carbohydrate metabolism (cyclase, cyclic adenylic acid, phosphorylase, and phosphofructokinase) were presented by those who have pioneered in this field, including E. Sutherland, E. Krebs, T. Mansour, C. R. Park, E. Helmreich, N. Haugaard, and J. R. Williamson.

The implications of catecholamines in lipid metabolism (activation of lipase in adipose tissue) are most recent; presentations by M. Vaughan, D. Steinberg, R. W. Butcher, L. Carlson, and S. Garattini brought up to date the exciting developments in this area. L. Lundholm, B. B. Brodie, L. D. Carlson, and A. Goldfien discussed the regulative function of catecholamines *in vivo* and their interaction with other hormones.

Much of the explosive growth of interest in catecholamines stems from the development of analytical methods for the neurohormones themselves and for their metabolites. The most interesting development in this area has been the introduction of fluorescence microscopy for detecting catecholamines *in situ*. O. Eranko, who first applied this procedure to adrenal medulla, discussed his work, and C. Owman and B. Falck discussed their applications of the method to visualization of the sympathetic nervous system in tissues.

Studies on the intracellular distribution of catecholamines within adrener-

gic tissues have shown them to be associated with specific subcellular particles. The role of catecholamines in adrenergic transmission has also received intensive study, as was apparent from the reports of J. H. Burn, W. W. Douglas, G. Burnstock, H. O. Schild, N. C. Moran, I. J. Kopin, and E. O. Titus. Douglas' report on the relationship of calcium to catecholamine release was received with great interest.

A most important session was the one on modification of sympathetic function, which summarized advances in the pharmacologic, immunologic, and surgical procedures which have been recently introduced to inhibit or enhance sympathetic nervous activity.

A number of reports dealt with the implications of catecholamines in man, including catechol-secreting tumors, hypertension, heart failure, and the central nervous system and behavioral aspects of catecholamines. A highlight of the final session was the report by N. A. Hillarp and K. Fuxe on elucidation of the sympathetic innervation in the central nervous system by use of fluorescence microscopy. Hillarp, who had pioneered this work, died shortly before the symposium and the paper was given by his colleague, K. Fuxe.

The symposium, which ranged from enzymology to electrophysiology and clinical medicine, covered essentially all aspects of catecholamines and is therefore of interest to scientists in many divergent disciplines. The American Society for Pharmacology and Experimental Therapeutics, which sponsored the symposium, has arranged for publication of the proceedings as a supplement to *Pharmacological Reviews*. The symposium proceedings (about 600 pages) will also be published by Williams and Wilkins.

SIDNEY UDENFRIEND
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Bethesda, Maryland 20014*

Forthcoming Events

February

8-9. **Cost Aspects of Water Supply**, 8th sanitary engineering conf., Urbana, Ill. (J. H. Austin, 203 Civil Engineering Hall, Univ. of Illinois, Urbana 61803)

9-11. **Solid State Circuits**, 13th annual conf., Philadelphia, Pa. (K. H. Fischer, U.S. Army Electronics Command, Attn: AMSEL-KL-I, Fort Monmouth, N.J.)

10-11. **Snow**, eastern conf., Hartford, Conn. (G. Ayer, P.O. Box 948, Albany 1, N.Y.)

10-12. **Intermediate Energy Physics**, conf., College of William and Mary, Williamsburg, Va. (R. T. Siegel, Physics Dept., College of William and Mary, Williamsburg 23185)

13-16. **Radiation Research Soc.**, 14th annual mtg., Coronado, Calif. (F. Smith, Biology Dept., American Univ., Washington, D.C.)

14-16. **Transplantation**, 7th intern. conf., New York Acad. of Sciences, New York, N.Y. (F. T. Rapaport, New York Univ. Medical Center, 550 First Ave., New York 10016)

14-18. **Society of Economic Geologists**, New York, N.Y. (J. O. Kallioikoski, Dept. of Geology, Princeton Univ., Princeton, N.J. 08540)

15-17. **Radioisotope Applications in Aerospace**, symp., Dayton, Ohio. (P. Polishuk, Flight Dynamics Laboratory, Wright-Patterson AFB, Ohio)

15-18. **Treatment and Storage of Highly Radioactive Waste**, symp., Richland, Wash. (W. H. Regan, Jr., U.S. Atomic Energy Commission, Washington, D.C. 20545)

16-17. **Voluntary Health**, 2nd natl. conf., Chicago, Ill. (Dept. of Community Health and Health Education, American Medical Assoc., 535 N. Dearborn St., Chicago)

16-18. **Practical Space Applications**, symp., San Diego, Calif. (C. Tross, Box 931, Rancho Santa Fe, Calif.)

16-19. **National Soc. of College Teachers of Education**, Chicago, Ill. (E. H. Goldenstein, Administration Bldg., 413, Univ. of Nebraska, Lincoln 68508)

16-19. **Institute of Management Sciences**, annual mtg., Dallas, Tex. (W. M. Campbell, Atlantic Refining Co., P.O. Box 2819, Dallas 75221)

17-19. **American Educational Research Assoc.**, Chicago, Ill. (R. A. Dersheimer, The Association, 1201 16th St., NW, Washington, D.C. 20036)

18-20. **American Psychopathological Assoc.**, symp., New York, N.Y. (F. A. Freyhan, The Association, Natl. Inst. of Mental Health, c/o St. Elizabeths Hospital, Washington, D.C. 20032)

19. **Pleistocene of Ohio**, interdisciplinary conf., Ohio Acad. of Science, Columbus. (J. L. Forsyth, Dept. of Geology, Bowling Green State Univ., Bowling Green, Ohio)

21-25. **Analytical Chemistry and Applied Spectroscopy**, Pittsburgh, Pa. (R. E. Hein, Mellon Inst., 4400 Fifth Ave., Pittsburgh 15213)

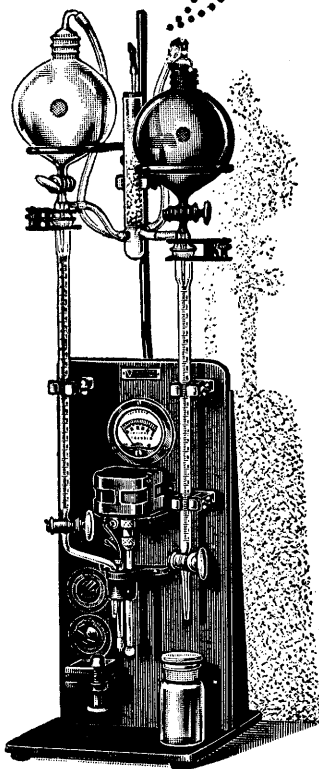
21-25. **Society for Nondestructive Testing**, spring natl. conv., Los Angeles, Calif. (E. L. Criscuolo, U.S. Naval Ordnance Laboratory, White Oak, Silver Spring, Md. 20910)

21-25. **Non-Elastic Processes in the Upper Mantle**, symp., Upper Mantle Committee, Intern. Union of Geodesy and Geophysics, Newcastle, England. (D. C. Tozer, School of Physics, The University, Newcastle-upon-Tyne, 1, England)

22-24. **Offshore Exploration**, 1st conf., Long Beach, Calif. (P.O. Box 88, 2550 Via Tejon, Palos Verdes Estates, Calif. 90275)

22-26. **Canadian Assoc. of Radiologists**, 29th annual, Montreal, Quebec. (The Association, 1555 Summerhill Ave., Montreal 25)

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23-25. **Biophysical Soc.**, 10th annual mtg., Boston, Mass. (J. Baruch, Bolt, Beranek and Newman Inc., 50 Moulton St., Cambridge, Mass. 02138)

24-26. **American Acad. of Forensic Sciences**, Chicago, Ill. (S. R. Gerber, Law-Medicine Center, Western Reserve Univ., Cleveland, Ohio 44106)

24-26. **Interdisciplinary Aspects of Radiative Energy Transfer**, Philadelphia, Pa. (J. J. Welsh, Space Sciences Laboratory, General Electric Co., Box 8555, Valley Forge, Pa.)

25-26. **Thoracic Soc.**, spring mtg., London, England. (H. M. Foreman, Sully Hospital, Sully, Glamorganshire, England)

27-3. **American Inst. of Mining, Metallurgical, and Petroleum Engineers**, annual mtg., New York, N.Y. (The Institute, 345 E. 47 St., New York 10017)

27-4. **International Anesthesia Research Soc.**, Bal Harbour, Fla. (A. W. Friend, 227 Wade Park Manor, Cleveland, Ohio 44106)

28-4. **Aerial Triangulation**, symp., Urbana, Ill. (M. B. Scher, Intern. Soc. for Photogrammetry, Commission 3, 9701 East Light Dr., Falls Church, Va.)

28-4. **American Crystallographic Assoc.**, mtg., Univ. of Texas, Austin. (W. L. Kehl, Gulf Research and Development Co., P.O. Drawer 2038, Pittsburgh, Pa. 15230)

28-4. **American Assoc. of Junior Colleges**, 46th annual conv., St. Louis, Mo. (The Association, 1315 16th St., NW, Washington, D.C. 20036)

March

1-2. **Dairy Engineering**, natl. conf., Michigan State Univ., East Lansing. (C. W. Hall, Agricultural Engineering Dept., Michigan State Univ., East Lansing)

1-3. **Space Maintenance and Extra-Vehicular Activities**, natl. conf., Orlando, Fla. (M. B. Goldman, Mail No. 302, Martin Co., Baltimore, Md. 21203)

1-10. **Industrial Development** in the Arab Countries, regional symp., Kuwait. (Intern. Agency Liaison Branch, Office of the Director General, Food and Agriculture Organization, Via delle terme di Caracalla, Rome, Italy)

2-4. **Air Pollution** Medical Research, AMA conf., Los Angeles, Calif. (Dept. of Environmental Health, American Medical Assoc., 535 N. Dearborn St., Chicago, Ill. 60610)

2-4. **Plasmadynamics**, conf., Monterey, Calif. (American Inst. of Aeronautics and Astronautics, 1290 Sixth Ave., New York 10019)

2-4. **Scintillation and Semiconductor Counters**, 10th symp., Washington, D.C. (W. A. Higinbotham, Brookhaven Natl. Laboratory, Upton, L.I., N.Y.)

3-4. **Louisiana Soc. for Electron Microscopy**, 3rd annual symp., New Orleans. (W. R. Goynes, Southern Regional Research Laboratory, Box 19687, New Orleans)

3-5. **Central Surgical Assoc.**, Chicago, Ill. (C. E. Lischer, 457 N. Kingshighway, St. Louis 8, Mo.)

4-5. **Cineradiology**, 5th symp., Rochester, N.Y. (R. Gramiak, Div. of Diagnostic Radiology, Univ. of Rochester Medical Center, Rochester 14620)

4-6. **American Assoc. of Pathologists**

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and **Bacteriologists**, 63rd annual mtg., Cleveland, Ohio. (P. Fitzgerald, Downstate Medical Center, 450 Clarkson Ave., Brooklyn 3, N.Y.)

5-7. Society for American **Archaeology**, 31st annual mtg., Univ. of Nevada, Reno. (D. D. Fowler, Dept. of Anthropology, Univ. of Nevada, Reno 89507)

5-10. International Acad. of **Proctology**, 18th annual conv., Miami Beach, Fla. (A. F. Cantor, 147-41 Sanford Ave., Flushing, N.Y. 11355)

6-11. American Soc. of **Photogrammetry**, Washington, D.C. (C. E. Palmer, 5917 Brookview Dr., Brookland Estates, Alexandria, Va.)

7-9. **Fundamental Cancer Research**, 20th annual symp., Univ. of Texas, Houston. (M. Mandel, Dept. of Biology, M. D. Anderson Hospital and Tumor Inst., Univ. of Texas, Houston 77025)

7-9. **Electric Propulsion**, 5th conf., American Inst. of Aeronautics and Astronautics, San Diego, Calif. (A. T. Forrester, Electro-Optical Systems, Inc., 300 N. Halstead St., Pasadena, Calif. 91107)

7-9. **Space**, 3rd congr., Cocoa Beach, Fla. (R. M. Barnes, PAA-Guided Missiles Range Div., Bldg. 423, MU 111, Patrick Air Force Base, Fla.)

7-11. American Soc. for **Metals**, western metal and tool exposition and conf., Los Angeles, Calif. (The Society, Metals Park, Ohio)

7-11. Society of **Plastics Engineers**, 22nd annual technical conf., Montreal, P.Q., Canada. (G. L. Bata, Union Carbide Canada, Ltd., P.O. Box 700, Pointe-aux-Trembles, P.Q.)

7-12. Inter-American **Nuclear Energy** Commission, 6th mtg., Washington, D.C. (J. D. Perkinson, Jr., Pan American Union, Washington 20006)

8-3. World **Meteorological** Organization, commission for synoptic meteorology, 4th session, Wiesbaden, Germany. (WMO, 41, avenue Giuseppe Motta, Geneva, Switzerland)

9-11. **Ethics in Medical Progress**, Ciba Foundation symp., London, England. (Ciba Foundation, 41 Portland Pl., London W.1)

9-13. Teaching Machines and **Programmed Instruction**, intern. symp., Nürtingen, Germany. (Arbeitsgemeinschaft Programmierte Instruktion, Inst. für Kybernetik, Pädagogische Hochschule Berlin, Malteserstr. 74-100, 1 Berlin 46)

10-11. **Heat Transfer** to Non-Newtonian Fluids, 12th annual heat transfer conf., Oklahoma State Univ., Stillwater. (J. D. Parker, Dept. of Mechanical Engineering, Oklahoma State Univ., Stillwater 74075)

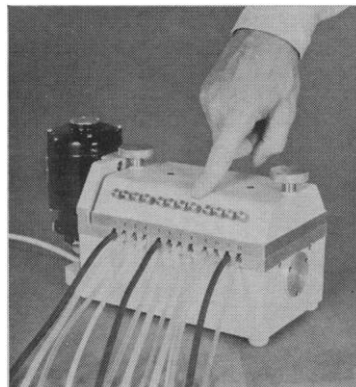
11-13. National Council of **Teachers of Mathematics**, San Diego, Calif. (J. D. Gates, 1201 16th St., NW, Washington, D.C. 20036)

11-13. National **Wildlife** Federation, annual mtg., Pittsburgh, Pa. (T. L. Kimball, 1412 16th St., NW, Washington, D.C. 20036)

12-13. **Linguistics**, 11th natl. conf., Linguistic Circle of New York, New York. (L. Pap, State Univ. College, New Paltz 12561)

14-16. Society of **Toxicology**, annual scientific mtg., Williamsburg, Va. (C. S. Weil, Mellon Inst., 4400 Fifth Ave., Pittsburgh, Pa. 15213)

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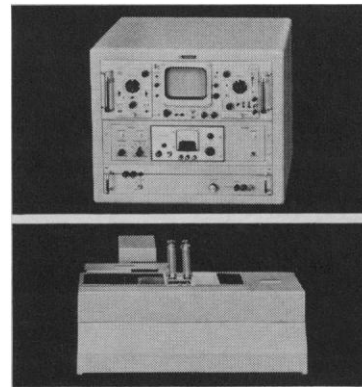
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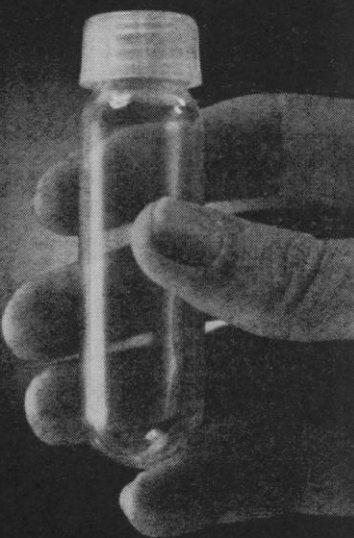
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14-16. **Wildlife and Natural Resources**, 31st North American conf., Pittsburgh, Pa. (C. R. Gutermuth, Wildlife Management Inst., Wire Bldg., Washington, D.C. 20005)

14-20. **Obstetrics and Gynecology**, 8th Australian congr., Hobart. (J. F. Correy, 173 Macquaire St., Hobart)

14-6 May. Extraordinary Administrative **Aeronautical Radio Conf.**, 2nd session, Geneva, Switzerland. (Intern. Telecommunication Union, Place des Nations, Geneva)

15-16. **Flame Resistant Polymers**, conf., London, England. (Secretary, Plastics Inst., 6 Mandeville Pl., London, W.1)

15-18. **Optical Soc. of America**, spring mtg., Washington, D.C. (M. E. Wurga, 1155 16th St., NW, Washington, D.C. 20006)

17-19. **Isobaric Spin in Nuclear Physics**, intern. conf., Florida State Univ., Tallahassee. (D. Robson, Dept. of Physics, Florida State Univ., Tallahassee)

18-19. **Rural Health**, conf., Colorado Springs, Colo. (B. L. Bible, 535 N. Dearborn St., Chicago, Ill. 60610)

18-20. **American Psychosomatic Soc.** annual mtg., Chicago, Ill. (W. A. Greene, The Society, 265 Nassau Rd., Roosevelt, N.Y. 11575)

20-23. **Solar Energy Soc.**, 2nd annual mtg., Boston, Mass. (F. Edlin, Arizona State Univ., Tempe 85281)

21-24. **Aerospace Instrumentation**, 4th intern. symp., College of Aeronautics, Cranfield, England. (E. K. Merewether, ISA Aerospace Industry Div., 4515 Canoga Ave., Woodland Hills, Calif.)

21-25. **Institute of Electrical and Electronics Engineers**, intern. conv., New York, N.Y. (IEEE, 345 E. 47 St., New York 10017)

22-23. **Biomagnetics**, 3rd intern. symp., Univ. of Illinois, Chicago. (M. F. Bar-nothy, Univ. of Illinois, 833 S. Wood St., Chicago)

22-23. **Modern Concepts of Cardiovascular Diseases**, conf. and workshop, Reno, Nev. (G. T. Smith, Laboratory of Patho-Physiology, Univ. of Nevada, Reno 89507)

22-24. **Measurement and Applications of Neutron Cross Sections**, conf., Washington, D.C. (W. W. Havens, Dept. of Physics, Columbia Univ., 538 W. 120 St, New York 10027)

22-31. **American Chemical Soc.**, spring mtg., Pittsburgh, Pa. (ACS, 1155 16th St., NW, Washington, D.C.)

23-25. **Institute of Mathematical Statistics**, Purdue Univ., Lafayette, Ind. (G. E. Nicholson, Jr., Univ. of North Carolina, Chapel Hill)

23-25. **Modern Methods of Weather Forecasting and Analysis**, Chicago, Ill. (J. R. Fulks, U.S. Weather Bureau, 5730 S. Woodlawn Ave., Chicago)

24-26. **Biomathematics and Computer Science in the Life Sciences**, symp., Houston, Tex. (Dean, Div. of Continuing Education, Univ. of Texas Graduate School of Biomedical Sciences, Texas Medical Center, Houston 77025)

24-26. **Pediatric and Adolescent Gynecology**, conf., New York Acad. of Sciences, New York. (W. R. Lang, Jefferson Medical College of Philadelphia, 1025 Walnut St., Philadelphia, Pa.)

24-26. **Pollution and Marine Ecology**, conf., Galveston, Tex. (S. M. Ray, Texas

A&M Univ. Marine Laboratory, Galveston 77550)

24-27. **International Assoc. for Dental Research**, 44th general mtg., Miami, Fla. (G. H. Rowelstad, U.S. Navy Dental School, Natl. Naval Medical Center, Bethesda, Md. 20014)

25-26. **National Assoc. of Biology Teachers**, western regional conv., Los Angeles, Calif. (The Association, Professional Building, Great Falls, Mont.)

26-2. **Stress Analysis**, 3rd intern. conf., Berlin, Germany. (H. Kotthaus, Verein Deutscher Ingenieure, Prinz-Georg Str. 77/79, 4 Düsseldorf 10)

26-27. **Arizona Chest Disease Symp.**, Tucson. (E. A. Oppenheimer, P.O. Box 6067, Tucson 85716)

27-30. **American Assoc. of Dental Schools**, Miami Beach, Fla. (R. Sullens, 840 N. Lake Shore Dr., Chicago, Ill.)

28-30. **Great Lakes Research**, 9th conf., Chicago, Ill. (B. M. McCormac, IIT Research Inst., 10 W. 35 St., Chicago 60616)

28-31. **Collegium Intern. Neuro-Psychopharmacologicum**, 5th biennial mtg., Washington, D.C. (M. K. Taylor, 3636 16th St., NW, Washington 20010)

29-31. **Airborne Infection**, 2nd intern. conf., Illinois Inst. of Technology, Chicago. (E. K. Wolfe, U.S. Army Biological Laboratories, Fort Detrick, Frederick, Md.)

29-31. **Applied Meteorology**, 6th natl. conf., Los Angeles, Calif. (B. N. Charles, Booz-Allen Applied Research, 6151 W. Century Blvd., Los Angeles 90045)

29-31. **Chemical Soc.**, anniversary mtgs., Oxford, England. (General Secretary, Burlington House, London W.1)

29-31. **Surface-Active Substances**, intern. conf., Berlin, East Germany. (Inst. für Fettchemie, Deutsche Akademie der Wissenschaften zu Berlin, Rudower Chaussee 5, 1199 Berlin-Adlershof)

29-31. **Symbolic and Algebraic Manipulation**, symp., Assoc. for Computing Machinery, Washington, D.C. (J. E. Sammet, I.B.M. Corp., 545 Technology Sq., Cambridge, Mass. 02139)

29-1. **American Assoc. for Contamination Control**, 5th annual technical mtg., Houston, Tex. (W. T. Maloney, The Association, 6 Beacon St., Boston, Mass. 02108)

29-1. **Ultraviolet and X-Ray Spectroscopy of Laboratory and Astrophysical Plasma**, conf., Abingdon, England. (Inst. of Physics and the Physics Soc., 47 Belgrave Sq., London, S.W.1, England)

30. **Oral Cancer**, 4th symp., St. Francis Hospital, Poughkeepsie, N.Y. (M. A. Engelman, 1 E. Academy St., Wappingers Falls)

30-1. **Magnetohydrodynamics**, 7th symp., Princeton, N.J. (R. G. Jahn, Guggenheim Laboratories, Forrestal Research Center, Princeton, N.J. 08540)

31-2. **Michigan Acad. of Science, Arts, and Letters**, Wayne State Univ., Detroit. (E. A. Wunsch, Dept. of English, Univ. of Michigan, Ann Arbor)

April

1-2. **Alabama Acad. of Science**, Birmingham-Southern College, Birmingham. (W. B. DeVall, Dept. of Forestry, Auburn Univ., Auburn, Ala.)

1-2. **Arkansas Acad. of Science**, Little Rock. (G. E. Templeton, Univ. of Arkansas, Fayetteville)