

Blood Flow Through Muscle

A group of investigators in the physiological research field convened on 9 March 1963 in Los Angeles to discuss the various aspects of circulation of blood through skeletal muscle. The meeting was primarily an open discussion which included only active, expert workers in this field.

A discussion on the topography of microcirculation in skeletal muscle emphasized the existence of several alternative routes which conduct blood from the arterial side to the venous side. It called attention to the dichotomy between blood flow in fascicular membranes and that through the muscle bundles, and noted how two qualitatively different paths exist within the muscle itself (B. W. Zweifach, New York University). The silicone elastomer injection technique was pointed out as a method for capturing permanent representations of peripheral vascular beds in various physiologic states. Thus, differences between resting muscle and hyperemic muscle can be dramatically displayed. Many questions concerning this approach to the measurement of distensibility of the components of the microcirculatory bed were discussed (Sidney S. Sobin, Loma Linda University).

Further studies on muscle blood flow described responses of muscle circulation to combinations of exercise and catechol amines, and the general concept of the interrelationship between local and central determinants of muscle flow was introduced (A. D. M. Greenfield, Queen's University, Belfast). Recent attempts have been made to separate blood flow through skin and muscle in the human forearm by use of the venous oxygen saturation method. Diversion between these two venous beds may occur under the physiological circumstances where such a measurement is required (John Shepherd, Mayo Foundation).

A report on blood content presented data on the concentration of norepinephrine and its metabolic breakdown products in venous blood draining muscles at rest and during stimulation of

their sympathetic supply. There seem to be highly significant differences in the total quantities and the relative amounts of these substances in the venous blood under the conditions studied (Sune Rosell, Karolinska Institutet, Stockholm). One aspect of research was covered in a talk on changes in strength of muscle contraction, local blood flow and tissue clearances in rhythmically stimulated, perfused skeletal muscles during superimposed intra-arterial infusion of acetylcholine and d-Tubocurarine (Ralph Sonnenschein, University of California). Other significant reports noted the importance of tissue fluid and lymph removal as determinants of nutritional supply to skeletal muscle (J. P. Henry, University of Southern California School of Medicine) and the redistribution of flow between shunt and nutritional pathways in skeletal muscle under conditions of local production of dilator substances (Chester Hyman, University of Southern California School of Medicine).

Participants felt that before any overall hypothesis relating local and systemic influences could be formulated, more detailed information and research would be required. It was also noted that data obtained in the many distinctly different types of preparations would have to be collated and re-evaluated in order to establish the true picture.

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Forthcoming Events

June

9-13. **Air Pollution Control Assoc.**, annual, Detroit, Mich. (A. Arch, 4400 Fifth Ave., Pittsburgh 13, Pa.)

9-15. **International Hospital Congr.**, 13th, Paris, France. (J. C. J. Burkens, Intern. Hospital Federation, 24/6 London Bridge St., London, S.E.1, England)

9-15. **National Speleological Soc.**, Mountain Lake, Va. (J. R. Holsinger, 115 W. Cameron Rd., Falls Church, Va.)

10-11. **American Vacuum Soc.**, annual conf., New York, N.Y. (W. G. Matheson, P.O. Box 1282, Boston 9, Mass.)

10-13. **German Metallurgical Soc.**, general assembly, Berlin. (Deutsche Gesellschaft für Metallkunde, Alteburger Str. 402, Köln-Marienburg, Germany)

10-14. **Health Physics Soc.**, annual, New York, N.Y. (L. Gemmell, Brookhaven National Laboratory, Upton, N.Y.)

10-14. **Molecular Structure and Spectroscopy**, symp., Columbus, Ohio. (H. H. Nielsen, Dept. of Physics and Astronomy, Ohio State Univ., 174 W. 18th Ave., Columbus 10)

10-15. **Engineering Societies of Western Europe and the U.S.**, 8th plenary assembly, Munich, Germany. (E. Hianne, Société Royale Belge des Ingénieurs et des Industriels, 3 rue Ravenstein, Brussels 1, Belgium)

10-21. **Analog Computation**, Washington, D.C. (B. P. Shah, Dept. of Mechanical Engineering, Catholic Univ. of America, Washington 17)

11-13. **Stimulus Generalization**, Boston, Mass. (D. Mostofsky, Boston Univ., 332 Bay State Rd., Boston 15)

12-14. **Heat Transfer and Fluid Mechanics Inst.**, Pasadena, Calif. (J. J. Harford, American Rocket Soc., 500 Fifth Ave., New York 36)

12-14. **Stochastic Models in Medicine and Biology**, Madison, Wis. (J. Gurland, Mathematics Research Center, U.S. Army, Univ. of Wisconsin, Madison 6)

13-14. **American Rheumatism Assoc.**, Atlantic City, N.J. (J. A. Coss, Jr., 20 E. 76 St., New York 21)

13-15. **American Soc. of Limnology and Oceanography**, Ann Arbor, Mich. (G. H. Lauff, Sapelo Island Research Foundation, Sapelo Island, Ga.)

13-15. **Endocrine Soc.**, Atlantic City, N.J. (J. H. Turner, 1200 N. Walker, Oklahoma City, Okla.)

13-15. **Great Lakes Navy Research and Development Clinic**, Columbus, Ohio. (B. D. Thomas, Battelle Memorial Inst., 505 King Ave., Columbus 1)

13-16. **International College of Angiology**, 5th annual, Atlantic City, N.J. (H. E. Shaftel, ICA, 32 Broadway, New York 4)

13-17. **American College of Chest Physicians**, Atlantic City, N.J., (M. Kornfeld, 112 East Chestnut St., Chicago 11, Ill.)

14-15. **Institute of Mathematical Statistics**, 95th Madison, Wis. (J. Gurland, Mathematics Research Center, U.S. Army, Univ. of Wisconsin, Madison 6)

14-17. **Instrument Soc. of America**, Los Angeles, Calif. (W. H. Kushnick, 530 William Penn Pl., Pittsburgh 19, Pa.)

15-16. **Advancement of Private Practice in Social Work**, 2nd conf., Denver, Colo. (P. Ledbetter, ACSW, Suite 1520, Medical Arts Bldg., Houston 2, Tex.)

16-19. **Northeastern Section, Botanical Soc. of America**, summer field meeting, Pittsburgh, Pa. (L. K. Henry, Section of Plants, Carnegie Museum, Pittsburgh 13)

16-20. **American Medical Assoc.**, Atlantic City, N.J. (R. M. McKeown, 510 Hall Bldg., Coos Bay, Ore.)

16-21. **American Inst. of Electrical Engineers**, general meeting, Toronto, Ont., Canada. (R. M. Magee, Bendix Systems Div., Ann Arbor, Mich.)

16-22. **Medical Librarianship**, 2nd

intern. congr., Washington, D.C. (R. MacDonald, Natl. Library of Medicine, Bethesda 14, Md.)

17-18. Learning, Adaptation, and Control in **Information Systems**, symp., Evanston, Ill. (J. T. Tou, Computer Sciences Laboratory, Technological Inst., Northwestern Univ., Evanston, Ill.)

17-19. American **Dairy Science** Assoc., Lafayette, Ind. (H. F. Judkins, 32 Ridgeway Circle, White Plains, N.Y.)

17-19. American **Nuclear** Soc., Salt Lake City, Utah. (R. E. Lightle, P.O. Box 521, Idaho Falls, Idaho)

17-19. Canadian Federation of **Biological Societies**, London, Ont. (A. H. Neufeld, CFBS, Faculty of Medicine, Univ. of Western Ontario, London, Ont., Canada)

17-19. Hanford Symp. on Biology of

Radioiodine, Richland, Wash. (L. K. Bustad, Biology Laboratory. General Electric Co., Richland)

17-19. Society for the Study of **Development and Growth**, Storrs, Conn. (W. A. Jensen, Dept. of Botany, Univ. of California, Berkeley 4)

17-21. American Soc. for **Engineering Education**, Philadelphia, Pa. (W. L. Collins, American Soc. for Engineering Education, Univ. of Illinois, Urbana)

17-21. **Gas Chromatography**, 4th intern. symp., Ann Arbor, Mich. (Instrument Soc. of America, 530 William Penn Pl., Pittsburgh 19, Pa.)

17-22. **Pacific Division, AAAS**, San Francisco, Calif. (R. C. Miller, California Acad. of Sciences, Golden Gate Park, San Francisco)

17-22. International Congr. of **Engi-**

neers, 4th, Munich, Germany. (Deutscher Verband Technisch-Wirtschaftlicher Vereine, Prinz-Georg-Str. 79, Düsseldorf, Germany)

17-23. Nuclear Energy, 8th intern. congr., Rome, Italy. (Ufficio Congressi e Mostre CNEN, Via Belisario 15, Rome, Italy)

18-20. Chemistry and Biochemistry of **Fungi and Yeasts**, symp., Dublin, Ireland. (T. S. Wheeler, Dept. of Chemistry, University College, Science Bldgs., Upper Merrion St., Dublin)

18-22. American Soc. of **Ichthyologists and Herpetologists**, Vancouver, B.C., Canada. (J. A. Peters, Biology Dept., San Fernando Valley State College, Northridge, Calif.)

19-21. Joint **Automatic Control** conf., Minneapolis, Minn. (T. J. Williams, Monsanto Chemical Co., St. Louis, Mo.)

19-21. Metal Chelates in **Chemical Analysis**, natl. symp., Tucson, Ariz. (H. Freiser, Dept. of Chemistry, Univ. of Arizona, Tucson)

19-26. **World Petroleum** Congr., 6th, Frankfurt-am-Main, Germany. (U.S. Natl. Committee, 15 W. 51 St., New York, N.Y.)

20-21. Institute of **Mathematical Statistics**, 96th, Eugene, Ore. (D. G. Chapman, Dept. of Mathematics, Univ. of Washington, Seattle 5)

20-21. **Nutrition** Soc. of Canada, 6th annual, London, Ont. (E. V. Evans, Dept. of Nutrition, Ontario Agricultural College, Guelph, Ont., Canada)

22-23. **Ukrainian Medical** Assoc. of North America, Kerhonkson, N.Y. (R. W. Sochynsky, UMA, 2 E. 79 St., New York 21)

23-26. American Soc. of **Agricultural Engineers**, Miami Beach, Fla. (J. L. Butt, P.O. Box 229, St. Joseph, Mich.)

23-29. American Soc. for **Horticultural Science**, Caribbean region, 11th annual, Mexico City, Mexico (E. H. Cásseres, Calle Londres 40, Mexico 6, D.F.)

23-26. American Soc. of **Mechanical Engineers**, Ithaca, N.Y. (A. B. Conlin, Jr., 345 E. 47 St., New York, N.Y.)

23-28. American Soc. for **Testing and Materials**, 66th annual, Atlantic City, N.J. (ASTM, 1916 Race St., Philadelphia 3, Pa.)

24-26. International **Astrophysical** Symp., 12th, Liège, Belgium. (M. Migeotte, Institut d'Astrophysique, Cointe-Sclessin, Belgium)

24-26. American Soc. of **Heating, Refrigerating and Air Conditioning** Engineers, Milwaukee, Wis. (R. C. Cross, 345 E. 47 St., New York 17)

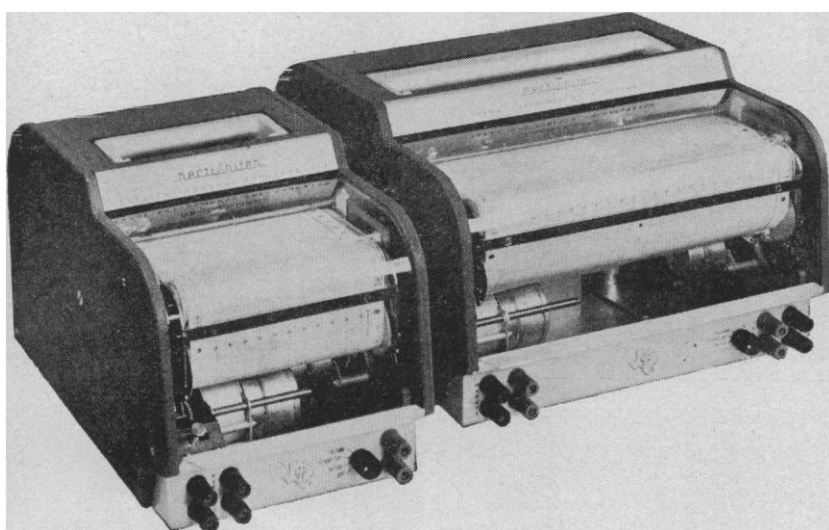
25-28. American **Home Economics** Assoc., Kansas City, Mo. (D. S. Miller, 3705 Van Buren Ave., Corvallis, Ore.)

26-27. **Computers and Data Processing**, Estes Park, Colo. (W. H. Eichelberger, Denver Research Inst., Univ. of Denver, Denver 10, Colo.)

26-28. **Wind Effects** on Buildings and Structures, Teddington, Middlesex, England. (Mrs. S. M. Russell, Aerodynamics Div., Natl. Physical Laboratory, Teddington)

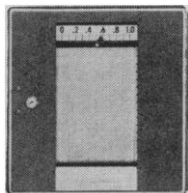
26-29. American Assoc. of **Bioanalysts**, annual, Chicago, Ill. (R. Thornburg, 720 N. Michigan Ave., Chicago 11)

(See 26 April issue for comprehensive list)



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