Fluid delivery rates... Precise... Consistent... Controlled... with new

EMDECO Infusion Pumps!

Choose *exactly* the peristaltic pump you need — single- or dualhead, with single, multiple or variable delivery rates that are constant to $\pm 1\%$ — even at levels as low as 0.03 and as high as 7.5 ml per minute. Quiet, contamination-free, they're so reliable they can be trusted in the most delicate and demanding applications. Send for EMDECO Bulletin EB-3S

> THE ELECTRO-MECHANICAL DEVELOPMENT CO. A Subsidiary of Coleman Instruments Corporation 42 Madison Street • Maywood, Illinois 60153

NEGA-FILE slides, tapes, film,

negatives • records



 Mahogany
 A-3500-G

 A-3500-G files 1625 cardboard mounts
 \$18.95

 A-21400-G files 800 2½4 x 2½4 in groups.
 19.95

 A-34-350 files 360 3½4 x 4 Lantern Slides.
 19.95

 A-34-350 files 360 3½4 x 4 Lantern Slides.
 19.95

 A-34-350 files 360 3½4 x 4 Lantern Slides.
 23.95

 A-3500-RT has 18 compartments for 400
 26.95

 A-3500-REC files 100 10" & 12" Records.
 31.95

 A-3500-FS has 63 single compartments for film strips, each 134" square
 17.95

 A-3500-G0 files 5400 3 x 5 files 200 3 x 5
 67.95

 with index and visible guides
 67.95

 Cards
 24.95

A-3500-3 x 3 files 200 3 x 5 A-3500-4 x 6 files 2000 4 x 6 cards 29.95 Sectional Hardwood Nega-Files are modular units. Stack with supplied escutcheon pins. Build your files as the need occurs. SEND FOR CATALOG OF COMPLETE FILING SYSTEMS.

NEGA

THE NEGA FILE COMPANY

FURLONG, PENNSYLVANIA

do you have an instrument problem.

EMDECO

iv injector

which is not covered by the ads in this issue? Write to us directly, giving full details and we will try to see that you receive the information you need.

SCIENCE MAGAZINE

Room 1740 11 West 42 Street New York, N.Y. 10036 work as coordinator for the Chapter Liaison Officers. Her work has prompted the National Council to create a Chapter Relations Committee to be chaired by the second vice president with the first vice president as one member. Thus, the continuity of these two interrelated committees will be maintained.

HARRIET M. BOYD The Fairfax, 43rd and Locust Streets, Philadelphia, Pennsylvania

Forthcoming Events

March

1-3. Effect of Malnutrition on Mental Development, Learning and Behavior, intern. conf., Cambridge, Mass. (Dept. of Nutrition and Food Science, Massachusetts Inst. of Technology, Cambridge 02139) 1-3. International Particle Accelerator,

1-3. International Particle Accelerator, conf., Washington, D.C. (Office of Technical Activities Board, 345 E. 47 St., New York, 10017)

1-3. Particle Accelerator, natl. conf., American Physical Soc., Washington, D.C. (J. A. Martin, Oak Ridge Natl. Lab., P.O. Box X, 4500S, S-103, Oak Ridge, Tenn. 37830)

2-4. Indian Ocean, symp., New Delhi, India. (N. K. Panikkar, Natl. Inst. of Oceanography, CSIR, Rafi Marg, New Delhi)

2-4. Nuclear Magnetic Resonance, conf., Pittsburgh, Pa. (B. L. Shapiro, Dept. of Chemistry, Illinois Inst. of Technology, Chicago, Ill. 60616)

2-10. Radioactive Dating and Methods of Low-Level Counting, symp., Vienna, Austria. (J. H. Kane, Conference Branch, Atomic Energy Commission, Washington, D.C. 20545)

5-9. International Gas Turbine, conf., Houston, Tex. (Meetings Manager, 345 E. 47 St., New York 10017) 6-7. High Speed Testing: The Rheology

6-7. High Speed Testing: The Rheology of Solids, 6th intern. conf., Boston, Mass. (R. H. Supnik, Plas-Tech Equipment Corp., 4 Mercer Rd., Natick, Mass. 01760)

6-10. Analytical Chemistry and Applied Spectroscopy, conf., Pittsburgh, Pa. (G. L. Carlson, Mellon Inst., 4400 Fifth Ave., Pittsburgh 15213)

6-10. WESTEC, 4th Western Metal and Tool Exposition and Conf., Los Angeles, Calif. (Director of Engineering Conf., 20501 Ford Rd., Dearborn, Mich. 48128)

8-10. Viscoelastic Response of Engineering Materials, mtg., Boston, Mass. (R. H. Supnik, 4 Mercer Rd., Natick, Mass. 01760)

8-22. United Nations Regional Cartographic Conf. for Asia and the Far East, Canberra, Australia. (United Nations, New York, N.Y.)

9-11. National Medicolegal Symp., Miami Beach, Fla. (Miss B. Spies, Law Dept., American Medical Assoc., 535 N. Dearborn St., Chicago, Ill. 60610)

SCIENCE, VOL. 155

10-11. National Conf. on **Rural Health**, Charlotte, N.C. (B. L. Bible, Secretary, American Medical Assoc., 535 No. Dearborn St., Chicago, Ill. 60610)

10-12. American Assoc. of Pathologists and Bacteriologists, Washington, D.C. (J. Lowell Orbison, School of Medicine and Dentistry, Univ. of Rochester, 260 Crittenden Blvd., Rochester, N.Y.)

13-14. Astronautics, symp., Ottawa, Ont., Canada. (The Secretary, Canadian Aeronautics and Space Inst., 77 Metcalfe St., Ottawa 4, Ont.)

13-15. 32nd North American Wildlife and Natural Resources Conf., San Francisco, Calif. (Wildlife Management Inst., 709 Wire Building, Washington, D.C. 20005)

13-17. International Laboratory Apparatus and Materials Exhibition, London, England. (U.T.P. Exhibitions Ltd., 3 Racquet Ct., Fleet St., London E.C.4)

13-17. Use of Plutonium as a Reactor Fuel, intern. symp.. Brussels, Belgium. (J. H. Kane, Div. of Technical Information, U.S. Atomic Energy Commission, Washington, D.C. 20545)

14-15. American Astronautical Soc. 5th Goddard Memorial Symp., "The Voyage to the Planets," Washington, D.C. (M. B. Lees, General Electric Co., Defense Programs Div., 777 14th St., NW, Washington, D.C. 20005)

14-15. Space, natl. mtg., Los Angeles, Calif. (D. P. Chandler, 3370 Miraloma Ave., Anaheim, Calif. 82803)

14-15. Temperature Measurements Soc., 5th conf., Los Angeles, Calif. (R. A. Finch, Conf. and Exhibit Chairman, Atomics International, P.O. Box 309, Canoga Park, Calif. 91304)

15-17. Instrumentation for the Iron and Steel Industry, Natl. Instrument Soc. of America, 17th conf., Pittsburgh, Pa. (F. J. Barchfeld, Jones & Laughlin Steel Corp., 900 Agnew Rd., Pittsburgh 15230) 16-18. Hydrogeology of the Northeast, Geological Soc. of America, Boston, Mass.

(M. Prinz, Tufts Univ., Medford, Mass.) 16-17. **Hypervelocity Techniques**, 5th symp., Denver, Colo. (A. A. Ezra, Research Inst., Univ. of Denver, Denver

80201) 16-19. International Assoc. for **Dental Research**, 45th general mtg., Washington, D.C. (G. H. Rovelstadt, c/o Navy Dental School, Natl. Naval Medical Center, Bethesda, Md. 20014)

17-21. National Science Teachers Assoc., conv., Detroit, Mich. (Executive Secretary, NSTA, 1201 16th St., NW, Washington, D.C. 20036)

19-24. Southeastern Surgical Congress, Bal Harbour, Fla. (A. H. Letton, Executive Secretary, 340 Boulevard N.E., Atlanta, Ga. 30312)

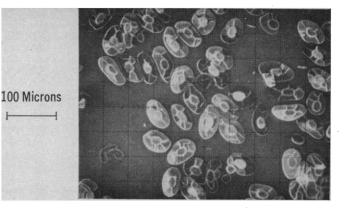
19-26. Canadian-American Medical and Dental Assoc., Vail, Colo. (T. Trapasso, Secretary, 816 Ashmum St., Sault Ste. Marie, Mich. 49783)

20-23. Institute of Electrical & Electronics Engineers, intern. conv., New York, N.Y. (A. B. Giordano, The Institute, 345 E. 47 St., New York 10017)

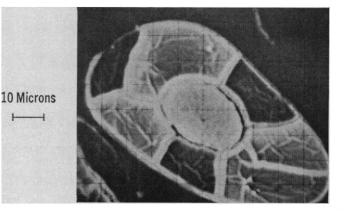
20. Field-Ion Microscopy, mtg., Cambridge, England. (Meetings Officer, Inst. of Physics and Physical Society, 47 Belgrave Sq., London S.W.1, England)

20-22. Physical Electronics, annual conf., Cambridge, Mass. (Research Lab. of

17 FEBRUARY 1967



Progress in Biological Research with Microprobe Analysis



An ARL **ELECTRON MICROPROBE X-RAY ANALYZER** provides scanning electronmicrographs of the type shown above. The specimens are large blood cells of a salamander, the amphiuma, which is only incidental to our story.

The important features of the micrographs are:

- Compared to optical micrographs at similar magnifications, the depth of focus is practically infinite.
- 2. Multielement in situ chemical analysis can be carried out within the detail of the cell structure shown—down to volumes in the order of several cubic microns. The microprobe is capable of *differentiating* the nucleus from the cytoplasm, or one part of the nucleus from another part, *on the basis of chemical composition*.

The microprobe provides the next step to further progress in Biochemistry. Applications work carried out to date includes studies related to:

Cytochemistry Histochemistry Physiochemistry Chemical pathology and Dental chemistry.

We will be happy to provide additional information.



APPLIED RESEARCH LABORATORIES, INC.

SUBSIDIARY OF BAUSCH & LOMB () 3717 PARK PLACE, GLENDALE, CALIFORNIA 91208

887

How Rapid Is Rapid Scanning?



The Model 501 Model 501 Rapid Scanning Spectrometer Scans 30A/usec. with Excellent Stability & Resolution; Covers Broad Wavelength Region in One Scan.

Write for Bulletin 10866 or Call (212) 461-4200



THE WARNER & SWASEY CO. CONTROL INSTRUMENT DIVISION 32-16 Downing Street • Flushing, New York 11354 Electronics, Massachusetts Inst. of Technology, Cambridge) 22-24. Astrogeology, symp., University

22-24. Astrogeology, symp., University of Michigan, Ann Arbor, Mich. (E. W. Heinrich, Dept. of Geology and Mineralogy, Univ. of Michigan, Ann Arbor 48104) 22-24. Modern Optics, intern. symp., New York, N.Y. (J. Fox, Polytechnic Inst. of Brooklyn, 333 Jay St., Brooklyn, N.Y. 11201)

23-24. Seeismological Soc. of America, Santa Barbara, Calif. (D. Tocher, U.S. Earthquake Mechanism Lab./ESSA, 390 Main St., San Francisco, Calif. 94105)

23-24. Social Facilitation and Imitation Behavior, symp., Miami Univ., Oxford, Ohio. (E. C. Simmel, Dept. of Psychology, Miami Univ., Oxford 45056)

23-25. Institute of Mathematical Statistics, central regional mtg., Columbus, Ohio. (G. E. Nicholson, Jr., Dept. of Statistics, Univ. of North Carolina, Chapel Hill 27515)

23-25. Society of **Toxicology**, Atlanta, Ga. (C. S. Weil, Mellon Inst., 4400 Fifth Ave., Pittsburgh, Pa. 15213)

26-30. Association of American Geographers, 63rd annual mtg., St. Louis, Mo. (Executive Officer, 1146 16th St., NW, Washington, D.C. 20036)

27-30. American **Physical** Soc., Chicago, Ill. (R. G. Sachs, P.O Box 344, Argonne, Ill.)

27-30. Canadian Inst. of Mining and Metallurgy, 69th annual mtg., Ottawa, Ont., Canada. (Secretary, 121 Richmond St. W., Toronto 1, Ont.)

28-30. Engineering Aspects of Magnetohydrodynamics, symp., Stanford, Calif. (R. H. Eustis, Stanford Univ., Stanford 94305)

28-30. **Photovoltaic** Specialists, 6th IEEE conf., Cocoa Beach, Fla. (F. A. Shirland, Clevite Research Center, 540 E. 105 St., Cleveland, Ohio 44108)

29-30. Building Research Advisory Board, research symp., "Performance Concept of Building," New Orleans, La. (R. W. Spangler, Board, Natl. Research Council-Natl. Acad. of Sciences, 2101 Constitution Ave., NW, Washington, D.C. 20418)

29-31. Immunologic Approaches to Mechanisms of Cutaneous Disease, New York Univ. Medical Center, New York, N.Y. (Office of Recorder, New York Univ. Post-Graduate Medical School, New York 10016)

29-31. The Origins of Schizophrenia, intern. conf., Rochester, N.Y. (J. Romano, Univ. of Rochester School of Medicine, Rochester 14620)

29-31. Structural Dynamics and Materials, conf., Palm Springs, Calif. (A. Kaplan, 1 Space Park, Redondo Beach, Calif. 90278)

29-1. Microcirculation as Related to Shock, conf., Boston, Mass. (D. Shepro, Boston Univ. Biological Science Center, 2 Cummington St., Boston 02215) 30-31. Transport Properties of Super-

30-31. Transport Properties of Superconductors, Canterbury, England. (Meetings Officer, Inst. of Physics and Physical Soc., 47 Belgrave Sq., London, S.W.1, England)

31-5. American Chemical Soc., San Francisco, Calif. (B. R. Stanerson, American Chemical Soc., 1155 16th St., NW, Washington, D.C. 20036)



Atomism in England From Hariot to Newton

By ROBERT HUGH KARGON, Johns Hopkins University. Of all the elements which emerged from the Scientific Revolution, the rise of atomism as a useful scientific explanation is one of the most interesting. This book traces the history of the introduction and spread of the atomic doctrine, and it presents as a case study those problems caused by the establishment of the new learning and its methodology. Professor Kargon discusses the theories and methods of such leading natural philosophers as Hariot, Bacon, Hobbes, Boyle, and Newton. \$6.75.

The Biology of Human Adaptability

Edited by PAUL T. BAKER, Pennsylvania State University, and J. S. WEINER, University of London. The Wenner Gren conference in Austria in 1964 brought together leading geneticists, physiologists, and anthropologists from all parts of the world to discuss problems of man in his natural environments and his adaptive responses to them. This book is based on that conference. The papers presented have been rewritten in the light of the conference as a whole and the introductory chapter presents much of the discussion that took place there. Maps, line drawings. \$16.80.

Infra-Red Physics

By J. T. HOUGHTON, Jesus College, Oxford, and S. D. SMITH, University of Reading. Designed for advanced undergraduates in physics or chemical physics and for the young research worker, this is a complete study of the basic principles and techniques of infra-red physics. In a theoretical introduction, quantum mechanics is applied to the interaction of radiation with molecular and crystal systems. Subsequent chapters contain accounts of molecular and solid state spectroscopy to illustrate basic processes; these include an unusually complete treatment of the optical properties of semi-conductors. In a final section the wide range of application of infra-red techniques is indicated, with particular reference to the study of planetary atmospheres. 135 figures. \$9.60.

Growth, Function and Regulation in Bacterial Cells

By SIR CYRIL HINSHELWOOD, and A. C. R. DEAN, Physical Chemistry Laboratory, Oxford. Advances in bacterial genetics are discussed here in terms of the kinetics of the cell as an organized entity. The authors deal with the key question, the relation between structure and form, by observing the cell in action, studying its growth and behavior, and formulating general propositions about the operation of physio-chemical laws within each cell system. Topics covered include: variation in cell composition, adaptation to drugs, and the decline of bacterial populations. 121 figures. \$13.45.

Oxford University Press

200 Madison Avenue New York, New York 10016

SCIENCE, VOL. 155