

The papers in this volume are largely self-contained and can be read independently. In general they are thoroughly referenced. The book contains detailed author and subject indexes. It will be of obvious value to the materials scientist or physiologist working in biomechanics, and it can be read profitably by many molecular, cell, developmental, and evolutionary biologists, as well as by physicians, anatomists, and ecologists.

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Patterns of Predation

Predation and Freshwater Communities.
THOMAS M. ZARET. Yale University Press,
New Haven, Conn., 1980. xiv, 188 pp., illus.
\$15.

As an alternative to the *post hoc ergo propter hoc* syndrome typified by ecological studies of competition, the author of this book tries "a different approach . . . From inductive reasoning, community models [of predation] are developed. . . predictions are generated and tested with field data." Zaret has been a leading researcher on size-selective fish feeding, effects of prey visibility on rates of predation, and vertical migration as an antipredator tactic in both temperate and tropical lake ecosystems. He thus writes with authority on the effects these and other aspects of predation have on freshwater communities. The result will certainly be of interest to ecologists seeking readable descriptions of the various processes by which predation molds the structure of natural communities and to freshwater biologists desirous of a well-referenced review of research on interactions among pelagic animals in lakes.

However, the book does not provide concise, quantitative models of predation that would serve as a basis for significant advancement in lake ecosystem studies. The models presented in chapter 6 are simple summaries of community patterns presented in earlier chapters along with descriptions of the species interactions (also presented earlier) that generate them. We learn that, when predation by planktivorous fish is moderate in lakes of northeastern United States, predation by invertebrates tends to be intense. This leads to the predominance of prey species 0.8 to 1.8 millimeters long that have reduced visible body size (to avoid vertebrate predators) and enlarged helmets and tail spines (to foil

the invertebrate predators). The models provide interesting and perceptive accounts of predation mechanisms that lead to community patterns routinely observed in lakes, although, curiously, the commonly observed coexistence of *Bosmina* and *Epischura* is not predicted. Too qualitative and descriptive to provide any but the most generalized predictions, these models also come dangerously close to being truisms. Field tests of the models presented in chapter 7 are based on two data sets (Galbraith's on Michigan lakes and Brooks and Dodson's on Connecticut lakes) that have already been cited in the development of the models. A third test data set (Nilsson and Pejler's on Swedish lakes) necessitates the development of a new submodel to account for the observed patterns.

Zaret considers the polarization in lake studies that has developed between "predationists" and "competitionists" to be counterproductive. He sensibly recommends that studies seeking to elucidate the ecological conditions under which each process is dominant will be the most profitable. Agreed; however, I think an important but little-discussed difference between the two processes deserves emphasis. Zooplankton communities in which competition predominates are inherently more efficient at transferring energy from algae to fish than are those in which the extra trophic link of predation is present. Thus for studies of lake productivity the distinction between competition and predation is important, whereas for explanations of why a small cladoceran disappears following removal of fish planktivores it is of little value. In fact, throughout the book Zaret gives little consideration to energy flow and ecological efficiency in lakes, emphasizing instead factors determining the densities of predators and their prey. Granted he makes no claim to address these problems, but some report of the considerable quantity of data on effects of prey size on fish growth efficiency and relations between production efficiency and body size in lakes would have been useful. Zaret's decision not to deal with algal grazing by zooplankton will be a disappointment to algologists who consider this to be a legitimate case of predation.

In his appended "further considerations" Zaret lists some interesting problems yet to be resolved. How do prey patches affect planktivore feeding? Why do tactile feeding copepods and filter-feeding cladocerans need eyes? Are toxic prey rare in lakes because, at the low light levels in which fish planktivores feed, aposematic coloration is ineffec-

tive? Does *Leptodora*'s strong oxygen dependency affect its ability to compete with other invertebrate predators? These and other questions are useful, but the list could become quickly dated because of the rapid progress of zooplankton ecology. Since the publication of the book it has already been shown, for instance, that cyclomorphosis in some *Daphnia* species (which Zaret correctly interprets as an antipredator tactic) can be induced by chemicals from notonectid and chaoborid predators. Because the book was a long time in preparation (since 1974) much recent work is not adequately incorporated, particularly that presented in the large volume published after the Dartmouth zooplankton symposium (*The Ecology and Evolution of Zooplankton Communities*, W. C. Kerfoot, Ed., University Press of New England, 1980).

Although this book is clearly a labor of love, it does not make a major contribution to the study of predation in freshwater communities and thus cannot be highly recommended.

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(Continued on page 1286)

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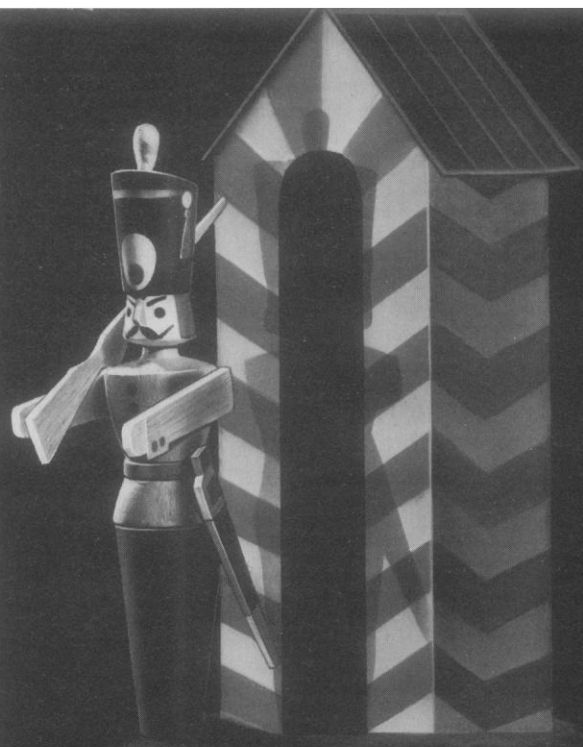
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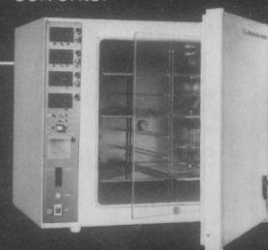
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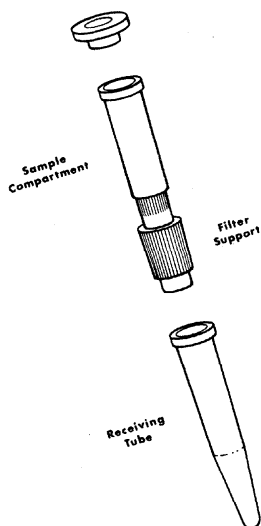
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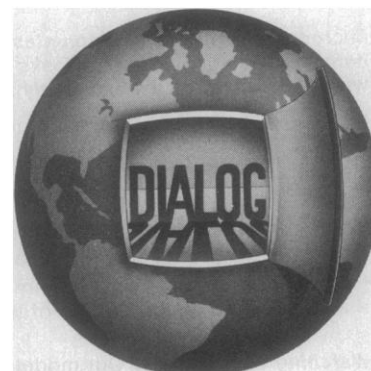
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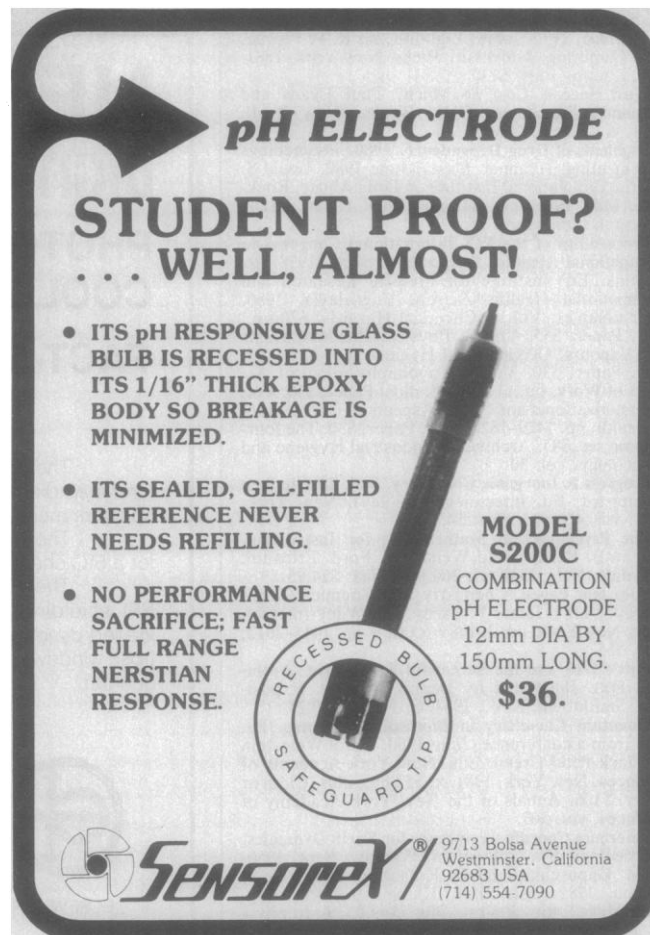
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*Messing, J. et al., *Nuc. Acids Res.* 9,309 (1981).

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ence, Berlin, July 1980. Burkhard Wende, Ed. Walter de Gruyter, New York, 1981. xvi, 1200 pp., illus. \$135.90.

SQUID '80. Superconducting Quantum Interference Devices and Their Applications. Proceedings of a conference, Berlin, May 1980. H. D. Hahlbohm and H. Lübbig, Eds. Walter de Gruyter, New York, 1980. xxx, 990 pp., illus. \$130.

Switching Power Converters. Peter Wood. Van Nostrand Reinhold, New York, 1981. xvi, 446 pp., illus. \$26.50.

A Systems View of Man. Ludwig von Bertalanffy. Paul A. LaViolette, Ed. Westview, Boulder, Colo., 1981. xx, 180 pp. Cloth, \$22; paper, \$10.

Technology and Manufacture of Ammonia. Samuel Strelzoff. Wiley-Interscience, New York, 1981. xxiv, 284 pp., illus. \$60.

Tectonics and Landforms. Cliff Ollier. K. M. Clayton, Ed. Longman, New York, 1981. viii, 324 pp., illus. Cloth, \$50; paper, \$24. Geomorphology Texts, 6.

Telecommunications Switching. J. Gordon Pearce. Plenum, New York, 1981. x, 338 pp., illus. \$29.50.

Theoretical Chemistry. Vol. 6, Part A. Theory of Scattering: Papers in Honor of Henry Eyring. Douglas Henderson, Ed. Academic Press, New York, 1981. xiv, 300 pp., illus. \$45.

Topics in Ergodic Theory. William Parry. Cambridge University Press, New York, 1981. x, 110 pp. \$23.95. Cambridge Tracts in Mathematics, 75.

The Transformed Cell. Ivan L. Cameron and Thomas B. Pools, Eds. Academic Press, New York, 1981. xiv, 438 pp., illus. \$49.50. Cell Biology.

Tree Disease Concepts. Paul D. Manion. Prentice-Hall, Englewood Cliffs, N.J., 1981. xvi, 400 pp., illus. \$22.95.

Underwater Acoustics and Signal Processing. Proceedings of an institute, Copenhagen, Denmark, Aug. 1980. Leif Bjørnø, Ed. Reidel, Boston, 1981 (distributor, Kluwer Boston, Hingham, Mass.). xvi, 736 pp., illus. \$87. NATO Advanced Study Institutes Series C, vol. 66.

U.S. Foreign Policy and the Law of the Sea. Ann L. Hollick. Princeton University Press, Princeton, N.J., 1981. xii, 498 pp. Cloth, \$32.50; paper, \$15.

Using the Radio Shack TRS-80 in Your Home. Kenniston W. Lord, Jr. Van Nostrand Reinhold, New York, 1981. xii, 458 pp., illus. \$21.95.

Victorian Science and Victorian Values. Literary Perspectives. James Paradis and Thomas Postlewait, Eds. New York Academy of Sciences, New York, 1981. xiv, 362 pp., illus. Cloth or paper, \$70. *Annals of the New York Academy of Sciences*, vol. 360.

Vitamins and Hormones. Advances in Research and Applications. Vol. 38. Paul L. Munson, Egon Diczfalussy, John Glover, and Robert E. Olson, Eds. Academic Press, New York, 1980. xiv, 388 pp., illus. \$42.

Water Activity. Influences on Food Quality. A Treatise on the Influence of Bound and Free Water on the Quality and Stability of Foods and Other Natural Products. Papers from a symposium, Osaka, Japan, Sept. 1978. Louis B. Rockland and George F. Stewart, Eds. Academic Press, New York, 1981. xviii, 922 pp., illus. \$60.

Water Movement in Mirelands. K. E. Ivanov. Translated from the Russian edition by Arthur Thomson and H. A. P. Ingram. Academic Press, New York, 1981. xxviii, 276 pp., illus. \$59.50.

Weddell Seal. Consummate Diver. Gerald L. Kooyman. Cambridge University Press, New York, 1981. x, 136 pp., illus. \$39.95.

Whole-Body Autoradiography. C. G. Curtis, S. A. M. Cross, R. J. McCulloch, and G. M. Powell. Academic Press, New York, 1981. xii, 126 pp., illus. \$30. Biological Techniques Series.

Who's Poisoning America. Corporate Polluters and Their Victims in the Chemical Age. Ralph Nader, Ronald Brownstein, and John Richard. Sierra Club Books, San Francisco, 1981 (trade distributor, Scribner, New York). xiv, 370 pp. \$12.95.

Words of the Lagoon. Fishing and Marine Lore in the Palau District of Micronesia. R. E. Johannes. University of California Press, Berkeley, 1981. xiv, 246 pp., illus. + plates. \$24.95.

Work Sharing. Issues, Policy Options and Prospects. Fred Best. Upjohn Institute for Employment Research, Kalamazoo, Mich., 1981. xvi, 204 pp. Cloth, \$8; paper, \$5.

The World Ocean. An Introduction to Oceanography. William A. Anikouchine and Richard W. Sternberg. Prentice-Hall, Englewood Cliffs, N.J., ed. 2, 1981. xiv, 514 pp., illus. \$19.95.

The World of Night. Lorus J. Milne and Margery J. Milne. Illustrations by T. M. Shortt. Harper and Row, New York, 1981. xiv, 250 pp. Paper, \$5.95. Reprint of the 1956 edition. Harper Nature Library.

Writing in the Arts and Sciences. Elaine P. Maillon, Gerald L. Belcher, Gail W. Hearn, Barbara F. Nodine, and Finbar W. O'Connor. Winthrop (Prentice-Hall), Cambridge, Mass., 1981. xvi, 336 pp., illus. \$10.95.

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BARUCH COLLEGE City University of New York ASSISTANT PROFESSOR

The Department of Natural Sciences invites applications for a tenure-track position beginning 1 September 1982. Teaching duties include courses in cell biology and general biology for undergraduates. Research interests should be in the area of **CELLULAR BIOCHEMISTRY AND PHYSIOLOGY**. Ph.D. required. Salary commensurate with qualifications and experience. Send application letter and curriculum vitae to: Dean Martin Stevens, Baruch College, Box 302, 17 Lexington Avenue, New York, N.Y. 10010. Closing date: 11 December 1981.

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Brown University is an Equal Opportunity/Affirmative Action Employer. Applications from women and minority persons are encouraged.

ASSISTANT PUBLIC HEALTH LABORATORY DIRECTOR. The State of Oregon Health Division located in Portland, Oregon, is seeking qualified candidates who meet state and federal requirements, including appropriate doctoral degree and experience in medical laboratory management. Salary is approximately \$1824 to \$2330 a month. Send résumé package to: Dr. William Murphey, State Public Health Laboratory Director, P.O. Box 275, Portland, Oregon 97207. Telephone: 503-229-5887. Equal Opportunity/Affirmative Action Employer.

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This is a tenure-track position for a Ph.D. or M.D. diplomate of the American Board of Microbiology or Board-eligible. The position involves major responsibilities in the Clinical Laboratories of the Department of Microbiology and will include serving as associate director of the Laboratories. The person selected will be expected to develop a vigorous research program in medical microbiology and to take part in the teaching of medical students, residents, and graduate students. Applications should include curriculum vitae and at least two letters of recommendation, which may be forwarded separately. They should be sent by 30 November 1981 to: **Dr. R. E. Marquis, Department of Microbiology, School of Medicine and Dentistry, The University of Rochester, Rochester, N.Y. 14642.**

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ASSISTANT PROFESSOR OF PHARMACOLOGY AND PROFESSOR OF TOXICOLOGY. Texas A & M University, College of Medicine, Department of Medical Pharmacology and Toxicology, invites applications for tenure-track appointments at the assistant professor and professor levels. Applicants must have the Ph.D. and/or M.D. degree with a record of productivity in neuropharmacology or toxicology research. Candidates should be well grounded in general pharmacology and capable of teaching pharmacology to medical students. Applicants should submit curriculum vitae, bibliography, statement of teaching and research goals, research funds, and names of three references to: **Dr. George Chlou, Professor and Head, Department of Medical Pharmacology, Texas A & M University, College of Medicine, College Station, Texas 77843.** Applications should be submitted no later than 31 December 1981. *Texas A & M University is an Equal Opportunity/Affirmative Action Employer.*

FACULTY POSITIONS

Two tenure-track appointments beginning in September 1982. One opening is in the area of **BIOORGANIC** chemistry. For the second position we seek applicants with an ability to bring new **INSTRUMENTAL** techniques to bear on interesting chemical, biochemical, or surface phenomena. Postdoctoral experience desirable. Applicants are expected to be capable of organizing and sustaining a vigorous research program of the highest quality. Send résumé, a description of research goals, and three letters of recommendation before 1 November 1981 to: **Dr. Jeong-long Lin, Chairman, Department of Chemistry, Boston College, Chestnut Hill, Mass. 02167.** *Boston College is an Affirmative Action/Equal Opportunity Employer.*

HEAD—DEPARTMENT OF BIOLOGY

Georgia Southern College, a 6800-student, comprehensive college of the University System of Georgia, invites nominations and applicants for position of head, Department of Biology, to replace person accepting a college presidency. Sixteen resident departmental faculty; four adjunct faculty at Skidaway Institute of Oceanography; 180 majors; baccalaureate and master's degrees offered. Primary duties administrative, but teaching or research also required.

Please request three confidential letters of recommendation and send résumé and transcripts by 15 October to: **Dr. James H. Oliver, Chairman, Department Head Search Committee, Department of Biology, Georgia Southern College, Statesboro, Georgia 30460.**

An Equal Opportunity/Affirmative Action Employer

POSITIONS OPEN

NATIONAL SCIENCE FOUNDATION (NSF)

NSF, Division of Social and Economic Science, has an opening for an **ASSOCIATE PROGRAM DIRECTOR IN SOCIOLOGY.** This is a rotational assignment for one or two years with a salary range of \$32,048 to \$49,229. Appointment will begin in fall 1981, or 1 January 1982. Candidates should have a Ph.D. and at least five years of successful scientific research experience. A broad, general understanding of current sociological research is required and some administrative experience is desirable. Responsibilities include all aspects of proposal development, review and evaluation, grants and program administration, and representation of sociology within the Foundation and to the research community. This position is exempted from the competitive civil service. Candidates should submit curriculum vitae no later than 15 October 1981 to: **The National Science Foundation, Personnel Administration Branch, Room 212, 1800 G Street, NW, Washington, D.C. 20550, attention: E. Paul Broglio, EX 81-38.** For further information, telephone: 202-357-7841. *NSF is an Equal Opportunity Employer.*

BIOCHEMIST—CLINICAL DIAGNOSTICS

Ph.D. or M.S. in immunochemistry or related field. Broad knowledge of immunochemistry, biochemistry, organic chemistry, and immunology required. Prefer candidates with experience in developing immunoassays. Position offers opportunity for technical challenge and career growth. Please send résumé with salary requirements in confidence to:

GILFORD DIAGNOSTICS
Personnel Manager
16035 Industrial Parkway, SW
Cleveland, Ohio 44135

BIOMECHANICAL ENGINEER

Large Medical Center is seeking an advanced degree (Ph.D.) biomechanical engineer for a faculty position in the Orthopedic Department of our Medical School. Position entails the development of precision instrumentation and experimental techniques to study kinematics and mechanics of spine and spinal instability, development of mathematical theories for data analysis and computer simulation of spine motion, and development of biomechanical models to study various spinal cord injury mechanisms.

Ideal candidate will have done doctoral dissertation work on biomechanics of spine, involving experimental and mathematical simulation studies.

We offer excellent salary (\$500 per week) for the 40-hour per week position.

Please submit résumé to:

Dr. Wilton Bunch
Department of Orthopedics
Loyola University Medical Center
2160 South First Avenue
Maywood, Illinois 60153

NATIONAL SCIENCE FOUNDATION (NSF)

NSF, Division of Policy Research and Analysis, has an opening for a **POLICY ANALYST** on a permanent or 1- to 3-year rotational appointment at the EC-13/14 level (equivalent to GS-13/14); \$32,048 to \$49,229 per annum based on qualifications and experience. The successful candidate will join a multidisciplinary policy research group assessing issues relating to environment, energy, and resources, and their national science and technology implications. Candidates should have a wide range of policy-related experience in fossil fuels utilization technologies, the environmental implications of those technologies, and energy resource issues relating to fossil fuels. Candidates should hold a Ph.D. in the physical sciences or another relevant field but equivalent experience may be substituted. At least three years of experience beyond the Ph.D. or equivalent is required. Applications will be accepted until position is filled. To apply, send a full biographical summary or completed SF-171, Personal Qualifications Statement, to: **National Science Foundation, Personnel Administration Branch, 1800 G Street, NW, Room 212, Washington, D.C. 20550, attention: E. Paul Broglio, EX 81-36.** For further information, telephone: 202-357-7829. *NSF is an Equal Opportunity Employer.*

POSITIONS OPEN

BIOTECHNOLOGY

Clinical Assays, an industry leader in radio-immunoassay kits and a division of an international Fortune 500 company, has an opening for a highly motivated

SENIOR SCIENTIST

To offer imagination, creativity, and technical expertise to its expanding research directions. Applicants should have postdoctoral or industrial experience and demonstrated success in an area of cell biology, immunology, or medical research. The position offers opportunities for management development and career advancement in a high growth company. We offer excellent salary, benefits, and facilities in an attractive Boston location. Please send résumé, including salary earnings history, to: **Clinical Assays, Division of Travenol Laboratories, Inc., D. Paris, 620 Memorial Drive, Cambridge, Mass. 02139.** *Equal Opportunity/Affirmative Action Employer, M/F.*

Dean, School of Allied Health
University of Kansas College of Health
Sciences and Hospital

Applications are being accepted for the position of **DEAN, School of Allied Health, University of Kansas College of Health Sciences and Hospital.** The candidates must have M.D., Ph.D., or equivalent doctoral degree to be considered. In addition to the degree requirements, candidates must have demonstrated administrative ability and experience, a record of sustained scholarly research and teaching, and evidence of a long-term commitment to the health sciences. Preference will be given to those candidates with educational experience in allied health fields. Deadline for accepting applications is 15 November 1981. Send curriculum vitae and letters of reference to: **Stanley R. Nelson, M.D., Department of Anatomy, University of Kansas College of Health Sciences and Hospital, 39th and Rainbow, Kansas City, Kansas 66103.**

An Affirmative Action/Equal Opportunity Employer

ENVIRONMENTAL INFORMATION SYSTEMS OFFICER

The Pan American Health Organization is seeking candidates for the position of **environmental information systems officer** with duty station in Lima, Peru. A master's degree in information, management, computer sciences, or related field is required, as well as a minimum of 5 years of experience in the organization and management of information systems, including the development of a significant information system, individually or as a team member. The selected candidate will be responsible for the implementation and operation of an information and documentation network on environmental engineering and sciences to serve the Latin American and Caribbean countries. Duties include the creation, development, and utilization of a computerized central bibliographic file, implementing technical cooperation and training activities to establish and/or reinforce national collaborating centers and the testing and evaluation of network's operational procedures and tools. Minimum salary and allowances are approximately: \$34,000, free of taxes, and excellent fringe benefits. Send résumé to:

Pan American Health Organization
Department of Personnel
525 23rd Street, NW
Washington, D.C. 20037

FACULTY POSITION. Somatic cell geneticist-molecular cell biologist with interest in human hereditary diseases is being sought to join the Department of Microbiology at the University of Alabama in Birmingham. Recruitment is possible as an assistant, associate, or full professor. Preference will be given to an individual with the potential for and commitment to developing an independent research program or to those established investigators who have already demonstrated success in establishing an independent research program. Interest in and aptitude for teaching graduate, medical, and dental students is also important. Position available during 1981-1982 academic year. Salary commensurate with experience but not less than \$26,000 for a 12-month appointment at the assistant professor level. Applicants should submit a letter outlining current and future research interests, curriculum vitae, and bibliography, and arrange to have three letters of reference sent to: **Dr. Roy Curtiss, III, Department of Microbiology, Box 11 SDB, The University of Alabama in Birmingham, Birmingham, Alabama 35294.** *An Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL POSITION/RESEARCH ASSOCIATE: available immediately to study the **GENETICS of METHANOGENIC BACTERIA.** A strong background in molecular biology (bacterial genetics and recombinant DNA technology) is desirable. A part of this research will involve development of genetic systems for these methane producing microorganisms. Send curriculum vitae and names of three references to: **Dr. J. Konisky, Department of Microbiology, 131 Burrill Hall, 407 South Goodwin, University of Illinois, Urbana, Illinois 61801. Equal Opportunity Employer**



Government of Canada

VISITING FELLOWSHIPS IN CANADIAN GOVERNMENT LABORATORIES

The Government of Canada offers fellowships for 1982-1983 on behalf of the following Canadian Government Departments and Agencies: Agriculture Canada; Department of Communications—Communications Research Centre; Department of National Defence; Energy, Mines and Resources Canada; Environment Canada—Atmospheric Environment Service; Canadian Forestry Service; Environmental Conservation Service—Inland Waters Directorate, Lands Directorate; Department of Fisheries and Oceans—Atlantic Fisheries, Pacific and Freshwater Fisheries, Ocean Science and Surveys; Health and Welfare Canada—Health Protection Branch; National Museums of Canada—Museum of Natural Sciences; National Research Council Canada; and Atomic Energy of Canada Limited.

Fellowships have an annual value of \$22,068 and are subject to Canadian income tax. Please note that the travel allowance is also considered a taxable benefit. Appointments are made for one year; renewals for a second year are possible in some departments/agencies.

Candidates normally should have a doctorate degree or equivalent experience within the last 5 years. Equivalent experience is considered to be a master's degree plus at least two years of experience beyond this degree, together with a demonstrated capability for conducting successful independent research. There are no restrictions limiting the nationality of applicants; however, successful candidates who are not Canadian citizens or Landed Immigrants residing in Canada must satisfy all of the Canadian immigration requirements before commencing tenure of the fellowship. Please note that the Department of National Defence can only consider applications received from Canadian citizens.

For further information, please write to: **The Scholarships Officer, Natural Sciences and Engineering Research Council Canada, Montreal Road, Ottawa Ontario, Canada K1A 0R6.**

Applications must be received in Ottawa by **15 January 1982** to be considered in the 1982-1983 competition.

Canada

VACANCY ANNOUNCEMENT

National Institutes of Health Public Health Service Department of Health and Human Services

The National Institutes of Health invites nominations and applications for the position of **DIRECTOR, NATIONAL HEART, LUNG, AND BLOOD INSTITUTE.** This is a Civil Service position in the Senior Executive Service (SES) with a salary range of \$52,247 to \$57,673 per annum (currently limited to \$50,112.50). The person selected may be eligible for Physician's Comparability pay up to \$10,000 per year. A 1-year probationary period must be served if the individual selected is not currently in the SES.

The director, National Heart, Lung, and Blood Institute, provides leadership and direction for the national program relative to diseases of the heart, lungs, blood, and blood vessels, and to blood utilization and resource management. The institute's staff embraces over 700 employees with a budget in excess of \$560 million.

Further information about the position and qualification requirements may be obtained by contacting: **Jacqueline Waters, telephone: 301-496-6521.** Applications (SF-171, Personal Qualifications Statement) accompanied by current curriculum vitae and bibliography should be submitted to Waters at: **OD-FIC-OA Personnel, Building 31, Room 1C15, National Institutes of Health, 9000 Rockville Pike, Bethesda, Md. 20205.**

Applications must be postmarked not later than 2 October 1981. (The SF-171 form is available at all federal personnel offices and job information centers.) *Applications from women and minority group candidates are solicited.*

An Equal Opportunity Employer

DIRECTOR CENTER FOR ASTROPHYSICS

The Smithsonian Institution and Harvard University invite applications or nominations for the directorship of the Center for Astrophysics, a scientific collaboration between the Smithsonian Astrophysical Observatory (SAO) and the Harvard College Observatory (HCO) in Cambridge, Massachusetts. The incumbent will serve jointly as director of SAO and director of HCO. It is expected that this person will receive a federal excepted appointment with the Smithsonian Institution, and that he or she will also be appointed to a tenured position as a professor of astronomy at Harvard University. Duties must be assumed by July 1983, and preferably sooner.

The Center for Astrophysics conducts a broad program of research, including x-ray, optical, infrared, and radio astronomy; solar physics; earth and planetary science; atomic and molecular physics; and theoretical astrophysics. A summary of this program, together with details of the observational and support facilities, may be obtained from the address given below.

Candidates will be evaluated primarily on their research achievements in astronomy or some related field; breadth of scientific understanding; intellectual leadership and vision; and talent for management and administration. Applications should contain the following: a résumé describing scientific and administrative experience, a list of publications, and names of three persons who may be contacted for references. Any supplementary statement of goals or conditions would also be welcome. Applications or nominations should be submitted by 1 October 1981 to:

**Dr. Alar Toomre, Chairman
Search Committee
Center for Astrophysics
60 Garden Street
Cambridge, Mass. 02138**

The Smithsonian Institution and Harvard University are Equal Opportunity/Affirmative Action Employers. Applications from women and minority groups are encouraged. All candidates will be evaluated in accordance with the established procedures of the two institutions. The person selected for this position will be required to file a confidential statement of employment and financial interests with the Smithsonian Institution.

POSITIONS OPEN

BIOLOGICAL BASES OF BEHAVIOR. The Department of Psychology at Yale University expects (subject to final administrative approval) to make a tenured appointment at either the **professor or associate professor level**, in any subspecialty that relates in broadest definition to the biological bases of behavior. The person appointed must have an exceptional, international reputation in research (unless at an early stage of a career that unambiguously points to one) and be able to contribute effectively to the undergraduate and graduate teaching programs of the university. Applicants should send a letter of application, a résumé, and one copy of selected publications, and should arrange for three letters of recommendation to be sent to: **Chair, Biological Search Committee, Department of Psychology, Yale University, New Haven, Conn. 06520.** Applications should be submitted by 1 December 1981. *Yale is an Equal Opportunity/Affirmative Action Employer, and applications from women and minority groups are especially encouraged.*

SIX FACULTY POSITIONS are available for the 1982-1983 academic year. Applicants will be considered at all academic levels. The successful applicants will be chosen from among:

**EUKARYOTIC GENETICS
EUKARYOTIC CELL BIOLOGY
NEUROBIOLOGY
ENTOMOLOGY
VERTEBRATE POPULATION BIOLOGY
EVOLUTIONARY BIOLOGY**

or outstanding candidates in related areas. Coordinated applications are encouraged. Clear designation of position desired will be appreciated. Successful candidates will be expected to have demonstrated commitment to quality teaching and a vigorous, independent research program. Please submit curriculum vitae (including biographical data), short statement of research objectives, names of at least five referees, and selected reprints to: **Clark Hubbs, Department of Zoology, University of Texas at Austin, Austin, Texas 78712**, before 1 November 1981.

FACULTY POSITIONS IN CELL BIOLOGY

Applications are invited for several tenure-track positions in the newly reorganized Department of Cell Biology and Anatomy at the Northwestern University Medical and Dental Schools. These positions are for assistant professors and, in exceptional cases, for associate professors. Applicants must have a Ph.D., M.D., or D.D.S. degree with research experience in cell biology, molecular biology, structural biology, biochemistry, or related areas. Applicants should be able to demonstrate excellence or the potential for excellence in their respective fields. Successful applicants will be expected to carry on vigorous research programs and to participate in the teaching of graduate, medical, and dental students. Send complete curriculum vitae, brief description of previous and future research and teaching interests (three to four pages), and recommendations from at least three referees by 30 October 1981 to: **Dr. Robert D. Goldman, Chairman, Department of Cell Biology and Anatomy, Northwestern University Medical and Dental Schools, 303 East Chicago Avenue, Chicago, Illinois 60611.** *Northwestern University is an Equal Opportunity/Affirmative Action Employer and invites applications from all qualified individuals.*

FACULTY POSITION. Assistant professor. Required to teach medical microbiology, virology, and molecular genetics to medical and graduate students and to maintain a vigorous research program. Salary dependent on experience and qualifications. Send curriculum vitae and three recommendations by 1 November 1981 to: **Dr. Fred Rapp, Chairman, Department of Microbiology, The Milton S. Hershey Medical Center, The Pennsylvania State University, Hershey, Pa. 17033.** *An Equal Opportunity/Affirmative Action Employer.*

Harvard University, The Department of Psychology and Social Relations is searching for **JUNIOR AP-POINTEES** (initially for a 5-year term, beginning 1 July 1982) in the areas of social, personality/psychopathology, and social/developmental psychology. In each case a secondary competence in multivariate analysis of data is welcome but not essential. Applicants should include current curriculum vitae and applicants should ask at least three individuals familiar with their work to write directly to: **R. Duncan Luce, Chairman, Department of Psychology and Social Relations, Harvard University, 33 Kirkland Street, Cambridge, Mass. 02138.** Applications received after 1 November 1981 may not be considered. *Harvard University is an Equal Opportunity/Affirmative Action Employer.*

POSITIONS OPEN

IMMUNOLOGIST

The Department of Medical Microbiology, College of Veterinary Medicine, University of Georgia, invites applications now for a position of assistant or associate professor. Responsibilities include teaching veterinary and graduate immunology courses, development of a research program in the immunologic or immunochemical aspects of animal diseases, preferably diseases of food producing animals, and participation in the college service program. The person selected will be expected to develop cooperative projects within the department as well as with investigators in other departments. *Women and minority candidates are encouraged to apply.* Qualifications include D.V.M. and Ph.D. or equivalent degrees or Ph.D. and postdoctoral training in immunology or immunochemistry. Closing date for applications is 1 December 1981. Submit detailed curriculum vitae, copies of recent publications, statement of professional goals, and names of three references to: **Dr. Donald Dawe, Department of Medical Microbiology, College of Veterinary Medicine, University of Georgia, Athens, Georgia 30602.** *An Equal Opportunity/Affirmative Action Employer.*

IMMUNOLOGISTS

Tenure-track, 12-month faculty appointments at junior-to-senior levels. Candidates must be capable of establishing strong and independent research programs in areas of molecular immunology, immunogenetics, developmental immunobiology, cellular immunology, or immunochemistry. Expertise in hybridoma and/or cell sorting and/or recombinant DNA technologies is desirable.

This is an exceptional opportunity to join an expanding Department of Microbiology committed to excellence in research and teaching and located in a desirable health science center environment. Send curriculum vitae, three letters of reference, and a statement of current and future research plans by 31 December 1981 to: **Joel B. Baseman, Ph.D., Chairman, Department of Microbiology, University of Texas Health Science Center, 7703 Floyd Curl Drive, San Antonio, Texas 78284.** *An Equal Opportunity/Affirmative Action Employer.*

IMMUNOLOGISTS

Immunologists needed by expanding biomedical R & D firm to work on development of immunomodulators for clinical application and studies of their structure and function. Must be experienced with techniques for isolation of lymphoid cell populations, measurement of surface markers, and measurement of in vitro parameters of cell mediated immunity. Requires M.D. or Ph.D. degree with minimum of 2 to 3 years of postdoctoral experience in cellular immunology. Cell sorter and hybridoma experience highly desirable. Attractive salary and benefits in one of America's most interesting cities. Positions available immediately. Send curriculum vitae and names of three references to:

**D. DeLong
Imreg, Inc.
P.O. Box 56643
New Orleans, La. 70156**

The Department of Family Practice at the University of Michigan Medical School is seeking to appoint a **MEDICAL DIRECTOR OF PREDOCTORAL STUDIES IN FAMILY MEDICINE.** Applicants should be Board-certified family physicians who have had significant experience in clinical practice as well as previous experience in teaching medical students. Academic rank and salary are negotiable. Inquiries should be directed to: **Terence C. Davies, M.D., Professor and Chairman, Department of Family Practice, University of Michigan Medical School, M2423 Med Sci 1, Ann Arbor, Mich. 48109.** *A nondiscriminatory, Affirmative Action Employer.*

MOLECULAR BIOLOGY

The Microbiology Department at Case Western Reserve University invites applications for several tenure-track faculty positions. We encourage applications from candidates with strong credentials in molecular biology, especially in areas relating to the regulation of gene expression. Experience in recombinant DNA techniques is desirable. These appointments provide excellent opportunities to develop independent research and teaching programs in an expanding medical school department. Send curriculum vitae, a statement of research and teaching interests, and the names of four references to: **Dr. Fritz Rottman, Chairman, Department of Microbiology, Case Western Reserve University, Cleveland, Ohio 44106.** *An Equal Opportunity/Affirmative Action Employer.*

POSITIONS OPEN

LABORATORY DIRECTOR. The University of Florida invites applications for the position of **professor and director**, Florida Medical Entomology Laboratory. Candidates should have an earned Ph.D. or equivalent in entomology or a closely related discipline. Administrative experience desirable. Demonstrated leadership and research ability is required. The individual filling this position at Vero Beach, Florida, will hold a tenure-accruing appointment in an appropriate academic department on our main campus. Applications accepted through 31 October 1981. Send a complete biographical résumé and three letters of recommendation to: **Dr. J. H. Frank, Florida Medical Entomology Laboratory, P.O. Box 520, Vero Beach, Fla. 32960.**

The University of Florida is an Equal Opportunity/Affirmative Action Employer.

CELLULAR IMMUNOLOGY LABORATORY FOUNDATION FOR BLOOD RESEARCH

A Ph.D. **LABORATORY DIRECTOR** is being sought to manage cellular immunology clinical testing and research in a nonprofit medical research/education institute located in southern Maine. Applicants must be certified to supervise HLA testing according to federal and AACT standards. Emphasis is to be placed on maintaining the quality of donor/recipient matching for a statewide transplant program and on developing new techniques relevant to patient care. The director will also be expected to establish rapport with other immunologic research sections at the Foundation for the purpose of developing multidisciplinary research initiatives. Apply to: **Administrator, Foundation for Blood Research, P.O. Box 428, Scarborough, Maine 04074-0428.**

MICROBIOLOGISTS

The Department of Biological Sciences, Purdue University, invites applications for two faculty positions that are either tenured or on a tenure-track. Both as 12-month appointments and can be filled immediately at any rank. Applicants with research experience and teaching interests in one or more of the following areas are especially encouraged to apply: microbial genetics, microbial physiology, microbial pathogenesis, eukaryotic microbiology. Send curriculum vitae, including a brief description of research experience and plans, and the names of three references to: **Microbiology Search Committee, Department of Biological Sciences, Purdue University, West Lafayette, Ind. 47907.** Applications should be submitted by 30 October 1981.

Purdue University is an Equal Opportunity/Affirmative Action Employer.

MODELER. 1 January 1982. Provide leadership in computing and modeling for agricultural teaching, research, and extension. Supervise programming staff; develop research projects in simulation modeling. Some knowledge of crop growth physiology preferred. Initial appointment is 1 year. Closing date no earlier than 1 October 1981. Send curriculum vitae to: **Dr. R. Kirk Steinhart, Department of Agricultural Economics and Applied Statistics, University of Idaho, Moscow, Idaho 83843.** *The University of Idaho is an Equal Opportunity/Affirmative Action Employer and Educational Institution.*

PATHOGENIC MICROBIOLOGIST or TUMOR VIROLOGIST trained in hybridoma technology to teach general microbiology, supervise graduate students, and maintain an active research program in area of specialty. Candidate must have demonstrated research ability in either of the above areas. Position will be at the level of assistant professor and salary will be competitive and commensurate with qualifications. Submit curriculum vitae, transcript of graduate work, three letters of recommendation, and statement of research interest to: **Dr. S. S. Husain, Search Committee, Chairperson, Indiana State University, Terre Haute, Ind. 47809**, by 1 November 1981. Position is to be filled no later than 1 September 1982. *Indiana State is an Equal Opportunity/Affirmative Action Employer.*

MOREHOUSE SCHOOL OF MEDICINE. PHARMACOLOGY FACULTY. Two positions are available at the **assistant professor level** in the Department of Pharmacology of Morehouse School of Medicine. Applicants must have terminal degree in pharmacology and demonstrate experience in teaching and research. Research interests of the department include cardiovascular, CNS, and anti-inflammatory pharmacology, as well as molecular biology/genetic engineering. Send curriculum vitae and names of three references to: **Faculty Search Committee, Department of Pharmacology, Morehouse School of Medicine, 830 Westview Drive, SW, Atlanta, Ga. 30314.**

SENIOR SCIENTIST- COGNITION ACTIVATOR PROGRAM

Warner-Lambert/Park-Davis, Pharmaceutical Research Division has available a position in the Cognition Activator program within the Pharmacology Department.

Primary responsibilities include participation in the maintenance of sophisticated ongoing rodent and primate operant learning and memory test systems. The incumbent will contribute to the development of models with improved predictive value for estimating the effects of cognition activators in man. A Ph.D. or equivalent experience, with an interest in drug discovery, are requisite. Physiological and/or neuro-chemical orientation with drug experience are highly desirable. Excellent communication skills are necessary.

Our research facilities, located next to the University of Michigan campus in Ann Arbor, Michigan, are among the finest and best equipped in the world and are devoted exclusively to the discovery and development of new drugs. We offer outstanding compensation, benefits and work environment. Send your resume and salary requirements to: Ms. B. Love, Personnel Supervisor, **WARNER-LAMBERT/PARKE-DAVIS, PHARMACEUTICAL RESEARCH DIVISION**, 2800 Plymouth Rd., Ann Arbor, Michigan 48105.

An Equal Opportunity Employer M/F/H

**WARNER
LAMBERT**

Director of Administration For Comparative Biology And Allied Institutions

Reporting to the Dean of the Faculty of Arts and Sciences, the Director will assist the department chairman and Allied Institutions Directors in interfacing the Department of Comparative Biology with the Allied Institutions, including: The Botanical Museum, Bussey Institution, Farlow Herbarium and Library, Gray Herbarium, Museum of Comparative Zoology, and Cambridge Segment of the Arnold Arboretum. The Director will oversee all administrative services, such as accounting and purchasing, for the institution operating budgets and for research grants; will be responsible for management and operation of Allied Institutions buildings, including space occupied by natural history collections, experimental laboratories offices, libraries, and exhibit areas open to the public, and will assist in planning and implementing renovation to this space. S/he will serve as a resource in the preparation of Federal and private grant applications for research and for collection improvement, and will explore new avenues for such support.

The buildings of the Allied Institutions are contiguous with each other and with The Biological Laboratories. They house approximately 35 faculty, 70 graduate students, and 80 support staff, and have a combined annual budget of approximately \$5,600,000 in University and sponsored research funds.

Candidates should have a doctoral degree in some aspect of organismic and evolutionary biology and at least 3 years' experience in scientific administration. This should include management of complex budgets, operation of physical plants, and mechanics of research support. Knowledge about the problems of systematic biology and management of natural history collections is desirable. Ability to communicate and work effectively with diverse groups of people and to understand management problems from the point of view of the working scientist are essential.

Applicants should submit vitae and names of 3 references to Robert M. Woollacott, The Biological Laboratories, Harvard University, Cambridge, MA 02138 before November 1, 1981.

HARVARD UNIVERSITY

An Affirmative Action/Equal Opportunity Employer

VETERINARY PATHOLOGIST

SmithKline Corporation, a multinational diversified health care firm based in Philadelphia, Pennsylvania, is seeking a Veterinary Pathologist for its Pathology/Toxicology Department, located at our expanding Upper Merion facility, 17 miles west of Philadelphia.

Candidates for this challenging position must have a D.V.M. or equivalent; an MS or PhD in Pathology; demonstrated ability in experimental investigative pathology; and a significant publication record. ACVP board eligibility is preferred. A broad background in laboratory animal and/or diagnostic pathology is desirable.

The successful candidate will investigate pathological changes induced in drug toxicity studies with special emphasis on elucidating pathogenesis and mechanism of toxicity. Participate in the design and conduct of routine and special studies; and collaborate with research scientists in other disciplines.

SmithKline offers an excellent compensation and benefits program including an attractive relocation package along with opportunities for personal and professional growth. Please send resume to: Mr. W.B. Flagg, **SMITHKLINE CORPORATION**, 1546 Spring Garden Street, Philadelphia, PA 19101. We are an equal opportunity employer, M/F/H/V.

**SmithKline
CORPORATION**

VACANCY ANNOUNCEMENT IN THE NATIONAL INSTITUTES OF HEALTH PUBLIC HEALTH SERVICE DEPARTMENT OF HEALTH AND HUMAN SERVICES

The National Institutes of Health (NIH) invites nominations and applications for the position of **associate director for medical applications of research**. This is a Civil Service position in the Senior Executive Service (SES), with a salary range from \$52,247 to \$57,673 per annum, depending on qualifications (currently, salary limited to \$50,112.50). Candidates may be eligible for Physicians Comparability Pay up to \$10,000 per year. Alternately, candidates may be eligible for appointment in the Commissioned Corps of the U.S. Public Health Service. The individual selected, if not presently in the SES, must serve a 1-year probationary period.

The associate director is responsible for assisting major units of NIH in the use of appropriate methods for identification and evaluation of clinically relevant new knowledge emerging from NIH and other programs and for effective transfer of this information to the health-care community. Further information about the position, including qualifications and requirements, may be obtained by telephoning: **Sharon Posy on 301-496-6521**. Applications (Personal Qualifications Statement, SF-171) are to be sent to: **Chairman, Search Committee for Director, OMAR, National Institutes of Health, Building 1, Room 132, 9000 Rockville Pike, Bethesda, Maryland 20205**. Current curriculum vitae and bibliography must accompany all applications. *Applications from women and/or minority group members are especially solicited.*

Applications will be accepted through 31 October 1981 and must be postmarked by that date.

An Equal Opportunity Employer

POSITIONS OPEN

MOLECULAR BIOLOGISTS—GENETICISTS

Tenure-track, 12-month faculty appointments at junior-to-senior levels. Candidates must be capable of establishing strong and independent research programs utilizing the most recent molecular biology—recombinant DNA technologies to examine the control of gene expression. Preferred areas of interest are the molecular basis of genetic diseases, molecular immunology-immunogenetics, and developmental biology-differentiation.

This is an exceptional opportunity to join an expanding Department of Microbiology committed to excellence in research and teaching and located in a desirable health science center environment. Send curriculum vitae, three letters of reference, and a statement of current and future research plans by 31 December 1981 to: **Joel B. Baseman, Ph.D., Chairman, Department of Microbiology, University of Texas Health Science Center, 7703 Floyd Curl Drive, San Antonio, Texas 78284. An Equal Opportunity/Affirmative Action Employer.**

NEUROPHYSIOLOGIST. Postdoctoral position. Immediate opening. Unique opportunity to work closely with small group of anatomists, physiologists, and theorists on aspects of cooperative phenomena in brain function. Should have experience in single unit recording, familiarity with computer analysis of data, and intermediate level physical science or mathematical background. Send résumé and have three letters of reference sent to: **N. M. Weinberger, Department of Psychobiology, University of California at Irvine, Irvine, Calif. 92717. An Affirmative Action/Equal Opportunity Employer.**

NEUROSCIENTIST with research interests in sensory or motor systems in vertebrates. Funds available for initial salary and laboratory support. Successful candidate expected to establish extramural funding base. Send curriculum vitae, description of program, and names of three references to: **Chairman, Search Committee, Neurological Sciences Institute of Good Samaritan Hospital & Medical Center, 1120 Northwest 20 Avenue, Portland, Oregon 97209.**

ORGANIC CHEMICAL ECOLOGIST

A Ph.D. organic chemist with research interests and expertise in the chemistry of ground water, streams, and rivers. Facility with organic analyses and a desire to study biochemical linkages between terrestrial and aquatic systems, transformations and activity of natural and introduced chemicals is essential. Postdoctoral experience desirable. The successful candidate will participate in on-going research programs and develop new studies addressing basic ecological questions and environmental problems. Send résumé and publications to: **Dr. R. L. Vannote, Stroud Water Research Center, Academy of Natural Sciences, R.D. Number 1, Box 512, Avondale, Pa. 19311. An Equal Opportunity Employer.**

PHYSICAL CHEMIST. Assistant professor, tenure-track position beginning spring or fall 1982 in a Ph.D. degree-granting Chemistry Department. Postdoctoral experience highly recommended. Applicant should have the ability and desire to teach undergraduate and graduate courses and is expected to develop a vigorous, independent research program in an area of experimental physical chemistry and to attract outside research grant funding. Please send résumé, transcripts, description of proposed research (one or more pages per problem), and three letters of recommendation by 23 October 1981 to:

**Chairman, Search Committee
Department of Chemistry
Duquesne University
Pittsburgh, Pa. 15282**

Affirmative Action/Equal Opportunity Employer

POSTDOCTORAL ASSOCIATES (two) to carry out research on the regulation of gene transcription by insulin in mammalian liver. Salary commensurate with ability. Send résumé and letters of recommendation to: **Dr. John W. Porter, Department of Physiological Chemistry, 589 Medical Science Building, University of Wisconsin, Madison, Wisconsin 53706. Affirmative Action/Equal Opportunity Employer.**

POSTDOCTORAL NUTRITION—BEHAVIOR SCIENCE research in cardiovascular disease prevention. Interdisciplinary research emphasized. NIH training grant. U.S. citizens with doctorates in behavioral or social sciences, nutrition, or medicine may send curriculum vitae, statement of interests, and three letters of reference to: **Dr. Ruth Brennan, Department of Preventive Medicine, Washington University School of Medicine, St. Louis, Mo. 63110.**

POSITIONS OPEN

DUKE UNIVERSITY POPULATION GENETICIST

The University Program in Genetics has an opening for a population geneticist in the Departments of Botany or Zoology. A strong theoretical background is desirable. The candidate is expected to develop a strong research program and to teach at both graduate and undergraduate levels. The appointment will be made at any level depending on qualifications, with a starting date of 1 September 1982. Curriculum vitae and the names and addresses of three references should be submitted by 15 October 1981 to: **Dr. N. W. Gillham, Director of the Genetics Program, Department of Zoology, Duke University, Durham, N.C. 27706. Duke University is an Equal Opportunity Employer.**

POSTDOCTORAL POSITION (research associate) available as of 1 November 1981 for a Ph.D. (or equivalent) with training in immunology, particularly cellular immunology. Knowledge of protein and carbohydrate purification is desirable. Send applications before 25 September 1981 to: **Dr. Marius Teodorescu, Department of Microbiology and Immunology, University of Illinois Medical Center, P.O. Box 6998, Chicago, Ill. 60680. The University of Illinois is an Affirmative Action/Equal Opportunity Employer.**

POSTDOCTORAL POSITION available immediately to study mode of action of antimalarial drugs. Research background in membrane or protein biochemistry preferred. Salary range: \$13,000 to \$15,000. Send résumé and names and addresses of three references to: **Dr. Coy D. Fitch, Division of Endocrinology, St. Louis University School of Medicine, 1402 South Grand Boulevard, St. Louis, Mo. 63104. An Equal Opportunity/Affirmative Action Employer, M/F/H.**

POSTDOCTORAL POSITION (research associate) available immediately for research on sympathetic nerve terminal and vascular smooth muscle function in hypertension. Experience in *in vitro* preparations and tyrosine hydroxylase assay preferred. Salary commensurate with qualifications. Send curriculum vitae, letter of interests, and three letters of recommendation before 10 October 1981 to: **L. T. Lais, Ph.D., School of Pharmacy, Oregon State University, Corvallis, Oregon 97331. An Equal Opportunity/Affirmative Action Employer in Compliance with Section 504 of the Rehabilitation Act of 1973.**

A **POSTDOCTORAL POSITION** is available immediately for a Ph.D. to study the mechanism and control of the vitamin K dependent gamma glutamyl carboxylase. Integral to these studies will be efforts to purify and characterize the enzyme. Background in biochemistry/biorganic chemistry preferred. Send applications and three letters of reference to: **Dr. Paul A. Friedman, Harvard Medical School, Department of Pharmacology, 25 Shattuck Street, Boston, Massachusetts 02115. An Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL POSITION available for 2 to 3 years to investigate receptor mechanisms involved in epithelial ion transport. Individuals with Ph.D. in pharmacology, physiology, or biochemistry should apply. Experience with analytical/biochemical techniques necessary. Starting salary: \$14,000 to \$15,500 per year. Send curriculum vitae and three references (with telephone numbers) to: **Dr. T. S. Gaginella, Division of Pharmacology, College of Pharmacy, 500 West 12 Avenue, Columbus, Ohio 43210. An Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL POSITION. Position available immediately for a person with strong background in techniques of protein separation and purification. The project involves analysis of cell growth factors and proteins affecting aspects of chemical carcinogenesis in primary cultures of rat and human hepatocytes. Salary: \$14,000, plus fringe benefits. Send curriculum vitae, reprints or preprints of pertinent publications, and two letters of recommendation to: **Dr. George Michalopoulos, P.O. Box 3432, Duke University Comprehensive Cancer Center, Durham, N.C. 27710.**

POSTDOCTORAL POSITION available immediately for the study of nucleosome structure and function. Background in protein and nucleic acid structure desirable. Please send curriculum vitae, statement of research background and interests, and two letters of reference to: **Dr. Harold G. Martinson, Department of Chemistry, University of California, Los Angeles, 405 Hilgard Avenue, Los Angeles, Calif. 90024. The University of California is an Equal Opportunity/Affirmative Action Employer.**

POSITIONS OPEN

POSTDOCTORAL POSITION—ENDOCRINOLOGY AND PHARMACOLOGY, available for 2 to 3 years beginning 1 January for a recent Ph.D. to study secretion of avian calcitonin. Specific projects include elucidation of structure, development of antisera, application of RIA for hormone measurement, *in vitro* and *in vivo* studies of hormone secretion, and study of factors regulating hormone biosynthesis and release. Background in peptide purification, RIA, and cell culture desirable. Send curriculum vitae and names of three references to: **Dr. Cary W. Cooper, Department of Pharmacology, 1030 FLOB, University of North Carolina School of Medicine, Chapel Hill, N.C. 27514. An Affirmative Action/Equal Opportunity Employer.**

POSTDOCTORAL POSITIONS IN MOLECULAR BIOLOGY are available in a program involving the IHRI and the University of Washington to study antigenic variation and control of gene expression in trypanosomes. Recombinant DNA, immunological (monoclonal antibody), and related technologies will be used; thus, experience in one or more of these areas would be useful. Salary: \$14,000 to \$16,000. Send curriculum vitae and names of three references to: **Dr. Kenneth Stuart, Issaquah Health Research Institute, 1595 Northwest Gilman Boulevard, Issaquah, Wash. 98027.**

POSTDOCTORAL POSITION available 1 December 1981. An enthusiastic, flexible, creative approach to experimental science is essential. The successful candidate will participate in an NIH-funded research project concerning the control of B lymphocyte behavior by antigen-bearing liposomes. One future direction of this project will involve photometric fluorescence microscopy. Salary: \$15,000 to \$16,500. Send curriculum vitae and names of three references to: **Dr. Gillian M. K. Humphries, Institute for Medical Research, 751 South Bascom Avenue, San Jose, California 95128.**

POSTDOCTORAL POSITION. Two-year, full-time appointment for Ph.D. in biochemistry or physiology to join ongoing research program related to the hydroxylating enzymes of the adrenal cortex and medulla. *In vivo* and *in vitro* studies involve isotope techniques, isolation and quantitation of steroids and catecholamines, and spectral determination of cytochromes. Salary: \$18,500 per year. Send curriculum vitae (with description of technical experience) and references to: **Lawrence M. Fishman, M.D., Division of Endocrinology and Metabolism (D-26), University of Miami School of Medicine, P.O. Box 016760, Miami, Florida 33101. An Equal Opportunity/Affirmative Action Employer.**

TRUDEAU INSTITUTE, INC.

A **POSTDOCTORAL RESEARCH POSITION** in immunology-parasitology is available immediately to study cellular mechanisms involved in the regulation and expression of immunity to rodent malaria. A background in immunology is highly desirable. Salary is \$14,000 per year, plus fringe benefits. Send curriculum vitae, date available, and three references to:

Dr. George L. Spitalny, Trudeau Institute, Inc., Box 59, Saranac Lake, New York 12983.

POSTDOCTORAL RESEARCH ASSOCIATE—Research on the metabolism and pharmacokinetics of chlorophenols in mammals. Ph.D. in organic chemistry, biochemistry, or pharmacology and previous research experience in drug metabolism and pharmacokinetics desirable. Salary: \$15,000 to \$18,000, depending on experience and qualifications. Send curriculum vitae and three letters of reference by 15 October 1981 to: **Dr. Donald R. Buhler, Department of Agricultural Chemistry, Oregon State University, Corvallis, Ore. 97331. An Affirmative Action/Equal Opportunity Employer, in compliance with Section 504 of the Rehabilitation Act of 1973.**

PROJECT ASSOCIATE

Ph.D. degree required with a minimum of two years of postdoctoral training in structural analysis of carbohydrates. Specifically, carbohydrate chemistry and tissue culture. In addition, 2 years of experience and expertise required in biochemical separation techniques, the use of lectins for isolation of glycoproteins and with enzymes involved in the synthesis and degradation of glyco conjugates necessary. **Two years of related experience** in glycoproteins analysis and purification and in the handling of embryonic tissue material from the chick. **Full-time; 40 hours per week.** Salary: \$16,236 per year. Please send résumé to: **Sath Menon, Job Service, P.O. Box 7943, 206 North Broom Street, Madison, Wisconsin 53707. Telephone: 608-266-2341 or 266-1492. This ad not paid for with Job Service funds.**

RECOMBINANT DNA RESEARCH

CORNING GLASS WORKS invites an outstanding scientist to join its expanding Biosciences Department as a member of the recombinant DNA research group.

The successful candidate should have a doctoral degree, experience in recombinant DNA research, and a significant record of scientific achievement. Experience with both DNA sequencing and synthesis is desirable.

We are located in the beautiful Finger Lakes region of upstate New York, approximately 250 miles from New York City.

We offer a pleasant working environment in addition to a competitive salary and benefits package.

Interested candidates should forward their resumes, lists of publications, reprints or preprints of pertinent publications and the names of three references, by no later than October 15, 1981 to:

**Mr. Gordon R. McPherson, Manager
Personnel Administration
Research and Development Division
Corning Glass Works
Sullivan Park
Corning, New York 14831**

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Canada

RESEARCH FELLOWSHIPS CANADA 1982

The Natural Sciences and Engineering Research Council announces a program of research fellowships tenable in universities and industries in Canada for 1982-83. Interested individuals must be nominated by a university or industrial firm in Canada; applications submitted directly to NSERC by candidates cannot be accepted.

Eligibility: Canadian citizens or landed immigrants holding a doctorate in science or engineering, preferably with postdoctoral research experience of 5 years or less.

Nature of Appointment: Fellows will be employees of the university or industrial firm for the duration of the award and will be engaged in research, development or innovation activities.

Duration of Appointment: Up to five years subject to satisfactory performance.

Remuneration: a) University Research Fellowships: NSERC will contribute up to \$25,000 per annum towards the cost of each fellow's salary and fringe benefits; fellows will also receive an annual research grant for an initial establishment period.

b) Industrial Research Fellowships: NSERC will contribute up to \$22,000 per annum towards the fellow's salary and fringe benefits for the first three years and \$10,000 per annum for the final two years.

Portability: Provided all parties concerned are in agreement, research fellowships are portable from the university sector to the industrial sector and vice-versa.

Application Procedures: Contact the Canadian university or industrial firm of your choice to carry out the appropriate negotiations concerning research plans, terms of appointment, salary, etc. Nominations are submitted to NSERC by universities or industrial firms, as the case may be. Applications submitted directly to NSERC by candidates cannot be accepted.

Deadlines: a) 1 November 1981 for University Research Fellowships

b) no deadline for Industrial Research Fellowships

For more information contact:

The Program Branch
Natural Sciences and Engineering Research Council
Ottawa, CANADA
K1A 0R6
Telephone: (613) 993-2454

STATE OF NEW YORK DEPARTMENT OF HEALTH

OVERHEAD POWER LINES PROJECT

Pre-proposals for contracts to study possible health hazards from exposure to low frequency (60Hz) electric and magnetic fields are requested in the following areas:

1. Genetic, cytogenetic, teratogenic, and reproductive studies
2. Cell and organ culture studies
3. *In vivo* animal physiology and pathophysiology
4. Animal and human neurobiology
5. Animal and human behavior
6. Multidisciplinary human studies with controlled exposure conditions
7. Epidemiology of human populations
8. Other studies relevant to health hazards

Advice on exposure facilities and dosimetry will be available. Send a pre-proposal containing a 2-5 page description of the proposed study, an approximate budget, and C.V.'s of all investigators, by 15 October 1981 to: David O. Carpenter, M.D., State of New York Department of Health, Albany, New York 12201. For further information call (518) 474-4170.

FOOD CHEMIST

Kellogg Company, one of the world's leading food manufacturers, has an opening for a Research Scientist.

This opening exists in the Chemistry Group of the Research Department to design and carry out highly creative and technically oriented project work in support of food research goals such as improved nutrition, prolonged shelf-life, and new product development. This position assists the group leader as required and participates in the direction of and the planning for the Chemistry Group.

A Ph.D. in Chemistry with strengths in food science or a Ph.D. in Food Science with strengths in analytical chemistry is required, along with strong communications skills and the ability and interest to move into a management position. Background in enzyme technology and one or more of the following areas is highly desirable: protein and carbohydrates.

This position offers a competitive starting salary, comprehensive benefits, relocation assistance and the opportunity for growth and development.

If you are interested and think you may qualify, please send a letter and/or resume along with salary requirements and transcripts to:

Bill Steele

Kellogg's

235 Porter Street
Battle Creek, Mich. 49016

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POSITIONS OPEN

RESEARCH ASSISTANT PROFESSOR OF CHEMISTRY (assistant faculty fellow). An appointment is available to participate in ongoing research in the chemistry and immunology of proteins involved in blood coagulation and fibrinolysis. Reappointment on a year-to-year basis is anticipated for 2 to 3 years. Candidates must possess postdoctoral experience and must have qualifications sufficient for a faculty level appointment. Applicants should send curriculum vitae and arrange for three references to be sent to: **Dean, College of Science, University of Notre Dame, Notre Dame, Ind. 46556. An Equal Opportunity/Affirmative Action Employer.**

HOSPITAL FOR SPECIAL SURGERY CORNELL MEDICAL CENTER

Research neurophysiologist (Ph.D.) and/or postdoctoral fellow to conduct ongoing research in spinal cord monitoring during corrective spinal surgery and to develop electrophysiological techniques for intraoperative recording of evoked responses. For further information, contact: **Peter Tsairis, M.D., Director of Neurology, Hospital for Special Surgery-Cornell Medical Center, 535 East 70 Street, New York, N.Y. 10021. An Equal Opportunity Employer.**

RESEARCH POLYMER CHEMIST. For theoretical studies in polymer science involving extension and application of recent developments in theory to specific structures. Required: Ph.D. in physical chemistry; one or more years of postdoctoral study in polymer theory; experience in mathematical modeling and computer techniques. Salary: \$2750 per month. Send résumé, including list of publications, to: **Employment Services Division, Delaware State Department of Labor, 801 West Street, Wilmington, Del. 19801. An Equal Opportunity Employer, M/F.**

VIROLOGIST (faculty position)—A position is available at the rank of assistant professor for a microbiologist with specialized training in virology. The individual is expected to develop a research program in a current area of virology and participate in the teaching programs of the department. Applicants must have adequate postdoctoral experience and the ability to establish a strong, independent research program. This tenure-track position can begin as early as October 1981. Interested persons should send résumé, summary of research interests, and names of three references to: **R. W. Schaedler, M.D., Chairman, Department of Microbiology, JEFFERSON MEDICAL COLLEGE OF THOMAS JEFFERSON UNIVERSITY, 1020 Locust Street, Philadelphia, Pa. 19107. Equal Opportunity Employer.**

MEETING

**Frontiers in Liposome Research:
Targeted Chemotherapy**
5 to 7 November 1981, San Francisco, California

A meeting sponsored by the Northern California Cancer Program and the School of Medicine, University of California, San Francisco, and organized by Dr. D. Papahadjopoulos, will bring together a group of investigators with diverse backgrounds to critically evaluate the use of liposomes for targeted chemotherapy. Recent advances in the field will be presented as a background for discussions on the prospects for future progress and clinical trials. The meeting will be limited to 75 participants. For additional information, contact: **Dr. F. Szoka, School of Pharmacy, University of California at San Francisco, San Francisco, California 94143.**

COURSE

**MOLECULAR ENDOCRINOLOGY AND
TECHNIQUES FOR HORMONE ACTION**
21 to 26 February 1982

Course will consist of lectures in methodology with comprehensive syllabus covering receptors, gene transcription, mRNA and protein synthesis, recombinant DNA, protein hormones, and cyclic nucleotides.

Co-directors: **W. T. Schrader** and **B. W. O'Malley**. Fee: \$265/\$195 (fellows). For further information, contact: **Barbara Gordin, Department of Cell Biology, BAYLOR COLLEGE OF MEDICINE, Houston, Texas 77030. Telephone: 713-790-6200.**

Deadline: 1 January 1982.

SYMPOSIUM

NUTRITION, PHARMACOLOGY, AND VISION

Sponsored by
**Committee on Vision
National Research Council
National Academy of Sciences**
16 and 17 November 1981
Washington, D.C.

• Major and minor dietary factors in adult and during development • Neuropharmacology of retina and visual cortex • Effects of drugs on visual performance

For further information, contact: **Dr. Key Dismukes, Study Director, National Academy of Sciences-National Research Council, Committee on Vision, 2101 Constitution Avenue, NW, Washington, D.C. 20418. Telephone: 202-389-6068.**

TRAINING PROGRAM

TRAINING PROGRAMS

PHARMACEUTICAL CELL BIOLOGY predoctoral teaching assistantships are now available for the winter quarter in the Department of Pharmaceutical Cell Biology at the University of Minnesota College of Pharmacy. This department offers a broad range of training in various aspects of cancer biology and drug action and development with emphasis on the use of plant and animal cell culture systems. Submit inquiries to: **Dr. E. J. Staba, Chairman, Department of Pharmaceutical Cell Biology, College of Pharmacy, University of Minnesota, Minneapolis, Minn. 55455.**

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FELLOWSHIPS

CARDIOPULMONARY PATHOLOGY FELLOWSHIPS. Two fellowship positions funded by NHLBI are presently available for 1 to 2 years of postdoctoral training in cardiovascular and/or pulmonary pathology at the Massachusetts General Hospital. Broad areas of ongoing research include both clinical and experimental studies of the pathogenesis of and therapeutic interventions in ischemic heart disease, atherosclerosis, hypertension, interstitial pulmonary diseases, and congenital heart disease. These positions offer an excellent opportunity for motivated pathology trainees to acquire specialized clinical training in cardiovascular and pulmonary pathology as well as research training in techniques such as gene cloning, monoclonal antibodies, gel electrophoresis, chromatography, computer data analysis and modeling, scanning and transmission electron microscopy, elemental analysis, morphometry, NMR imaging, and many others. Positions are open to U.S. citizens or permanent residents with an M.D. or M.D./Ph.D. degree having a minimum of 2 years of anatomic pathology residency training. Send curriculum vitae and letters of recommendation to: **John T. Fallon, M.D., Ph.D., Department of Pathology, Massachusetts General Hospital, Boston, Mass. 02114. An Equal Opportunity Employer.**

POSTDOCTORAL RESEARCH FELLOWSHIPS are available at **THE UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER, SAN ANTONIO (UTHSCSA)**, for graduates in biology, medicine, biochemistry, or the biological sciences with a Ph.D., M.D., or D.V.M. degree.

Monocyte biology, with reference to cell-cell attachment, chemoattractants and chemotaxis, and cellular differentiation with respect to the evolution of cell surface receptors. Studies will utilize vascular tissue and extravascular granulomas.

The regulation of endocytosis, with respect to cell surface charge, the charge and charge density of ligands, and the functional integrity of the cellular cytoskeleton. Particular emphasis will be directed to adsorptive and receptor-mediated endocytosis, using cultured vascular cells.

Lipoprotein-cellular interactions. This area will address the important question of monocyte-lipoprotein binding and internalization, and will involve cellular metabolic studies, together with state-of-the-art approaches to lipoprotein isolation, purification, and characterization.

Applicants must be either U.S. citizens or permanent residents. Send curriculum vitae and names of three references to: **Colin J. Schwartz, M.D., Program Director, Department of Pathology, UTHSCSA, 7703 Floyd Curl Drive, San Antonio, Texas 78284. Equal Opportunity/Affirmative Action Employer.**

FELLOWSHIPS

POSTDOCTORAL FELLOWSHIP IN CLINICAL LABORATORY IMMUNOLOGY. Applications are invited for a 2-year fellowship in Clinical Laboratory Immunology at North Carolina Memorial Hospital (NCMH) and the University of North Carolina (UNC). Fellowship provides residency-type training in diagnostic laboratory immunology through laboratory experience, conferences, and research. Position is available 1 July 1982. Send curriculum vitae and three letters of reference to: **Dr. James D. Folds, Clinical Immunology Laboratory, Department of Hospital Laboratories, North Carolina Memorial Hospital, University of North Carolina, Chapel Hill, N.C. 27514.** Deadline for submission of completed applications is 1 December 1981. *UNC/NCMH is an Equal Opportunity/Affirmative Action Employer.*

NIH-SUPPORTED POSTDOCTORAL FELLOWSHIP IN COMMUNICATION BIOPHYSICS

Fellows will conduct research in well-equipped laboratories in collaboration with senior investigators in the fields of psychoacoustics, auditory, or communication engineering. Candidates should have recent Ph.D. in experimental psychology, speech and hearing, or electrical engineering. Opportunity also provided to become familiar with basic and clinical research in other fields relevant to communication disorders, including neurophysiology, neuroanatomy, neurochemistry, speech physiology genetics, and language development.

Contact: **C. S. Watson, Boys Town Institute for Communication Disorders in Children, 555 North 30 Street, Omaha, Nebr. 68131. An Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL RESEARCH FELLOWSHIPS in the areas of hormone action, metabolism, and diabetes. This is a multidisciplinary program with research training by faculty preceptors in basic and/or clinical areas, funded by NIH. Interested applicants with M.D. or M.D.-Ph.D. degrees with or without residency training or with a Ph.D. degree should send curriculum vitae and letters of reference to: **Dr. Randall T. Curnow, Program Director, Departments of Internal Medicine and Pharmacology, Box 419, University of Virginia, Charlottesville, Va. 22908. An Affirmative Action/Equal Opportunity Employer.**

MARKETPLACE

DIRECTORY OF 90 U.S. BIOTECHNOLOGY COMPANIES

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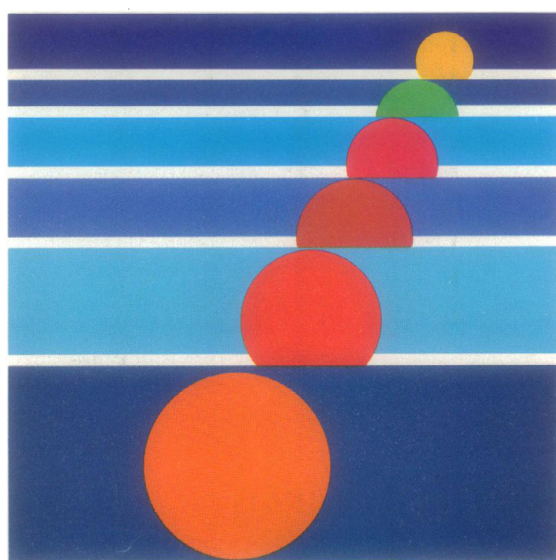
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The particles are made of polystyrene with some

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| 15.0 μm | Polystyrene/DVB | 60.00 | |
| 20.0 μm | Polystyrene/DVB | 60.00 | |
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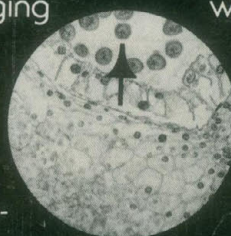
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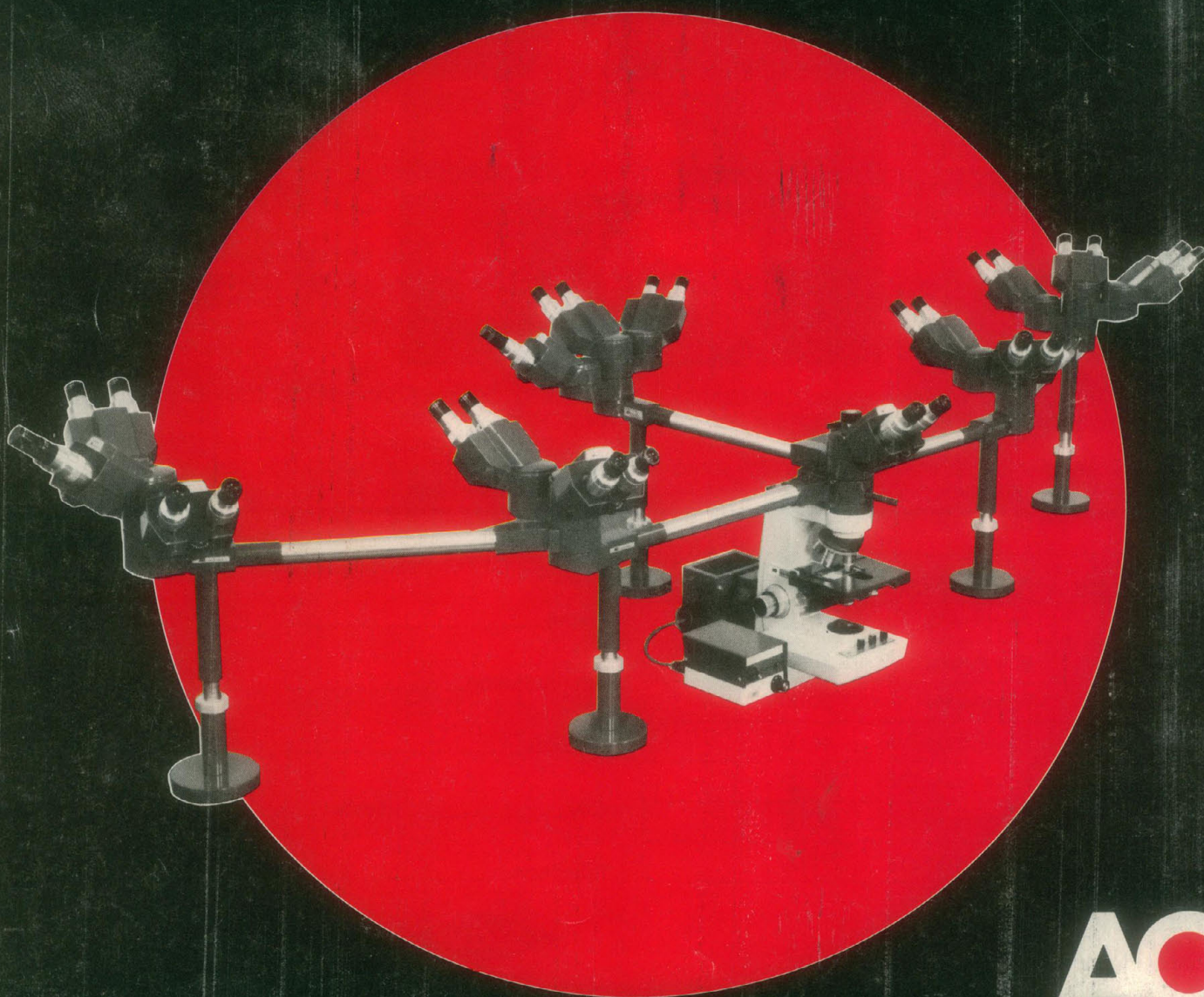
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