

## BOOKS RECEIVED AND

## BOOK ORDER SERVICE

(Continued from page 706)

**Heat and Mass Transfer Data Book.** C. P. Kothandaraman and S. Subramanyan. Halsted (Wiley), New York, ed. 3, 1977. viii, 150 pp., illus. \$7.95.

**A History of Scientific Endeavour in South Africa.** A Collection of Essays Published on the Occasion of the Centenary of the Royal Society of South Africa. A. C. Brown, Ed. Royal Society of South Africa, University of Cape Town, Rondebosch, 1977. xii, 516 pp., illus. \$22.50.

**Horizons in Biochemistry and Biophysics.** Vol. 4. E. Quagliariello, F. Palmieri, and Thomas P. Singer, Eds. Addison-Wesley Advanced Book Program, Reading, Mass., 1977. xvi, 302 pp., illus. \$19.50. To order this book circle No. 418 on Readers' Service Card.

**Hormonal Proteins and Peptides.** Vol. 4, Growth Hormone and Related Proteins. Choh Hao Li, Ed. Academic Press, New York, 1977. xii, 214 pp., illus. \$21.50.

**Imms' General Textbook of Entomology.** Vol. 1, Structure, Physiology and Development. O. W. Richards and R. G. Davies. Chapman and Hall, London, and Halsted (Wiley), New York, ed. 10, 1977. viii, 418 pp., illus. Cloth, \$35; paper, \$13.50.

**Innovation, Economic Change and Technology Policies.** Proceedings of a seminar, Bonn, Germany, Apr. 1976. Karl A. Stroetmann, Ed. Birkhäuser, Verlag, Basel, 1977. x, 350 pp., illus. Paper, SwF 52. Interdisciplinary Systems Research 51.

**Intercalation Compounds of Graphite.** Proceedings of a conference, La Napoule, France, May 1977. F. Lincoln Vogel and A. Hérol, Eds. Elsevier Sequoia, Lausanne, Switzerland, 1977. viii, 356 pp., illus. \$60. Reprinted from *Materials Science and Engineering*, vol. 31, Dec. 1977.

**Introduction to Chemical Principles.** Edward I. Peters. Saunders, Philadelphia, ed. 2, 1978. xvi, 564 pp., illus. \$14.95. Saunders Golden Sunburst Series.

**Ir Genes and Ia Antigens.** Proceedings of a workshop, Asilomar, Calif., Dec. 1976. Hugh O. McDevitt, Ed. Academic Press, New York, 1978. xviii, 614 pp., illus. \$19.

**Kupffer Cells and Other Liver Sinusoidal Cells.** Proceedings of a symposium, Noordwijkerhout, The Netherlands, Sept. 1977. E. Wisse and D. L. Knook, Eds. Elsevier/North-Holland, New York, 1977. xii, 544 pp., illus. \$68.75.

**A Laboratory Manual for Human Physiology.** Barbara H. Kalbus and Kenneth G. Neal. Burgess, Minneapolis, ed. 2, 1978. xvi, 400 pp., illus. Paper, \$9.95.

**Laser-Induced Discharge Phenomena.** Yu. P. Raizer. Translated from the Russian edition (Moscow, 1974) by Albin Tybulewicz. George C. Vlases and Z. Adam Pietrzyk, Eds. Consultants Bureau (Plenum), New York, 1977. xiv, 366 pp., illus. \$39.50. Studies in Soviet Science.

**Lichen Ecology.** Mark R. D. Seaward, Ed. Academic Press, New York, 1977. x, 550 pp., illus. \$44.90.

**The Lives of a Cell.** Notes of a Biology Watcher. Lewis Thomas. Penguin, New York, 1978. vi, 154 pp. Paper, \$3.50. Reprinted from *The New England Journal of Medicine*. Reprint of the 1974 edition.

**Living with Energy.** Ronald Alves. Photographs by Charles Milligan. Penguin, New York, 1978. 128 pp. Paper, \$5.95.

**Macromolecular Microsymposium—16.** Papers from a meeting, Prague, July 1976. B. Sedlacek, Ed. Pergamon, New York, 1977. vi pp. + pp. 905-962, illus. \$9. Also published as *Pure and Applied Chemistry*, vol. 49, No. 7.

**Mechanics Today.** Vol. 4. S. Nemat-Nasser, Ed. Published for the American Academy of Mechanics by Pergamon, New York, 1978. xxvi, 420 pp., illus. \$50. To order this book circle No. 419 on Readers' Service Card.

**Microbiology—1978.** Papers from two meetings, Jackson, Wyo., Feb. 1977, and New Orleans, May 1977. David Schlessinger, Ed. American Society for Microbiology, Washington, D.C., 1978. x, 450 pp., illus. \$22.

**Practical Enzymology of the Sphingolipidoses.** Robert H. Glew and Stephen P. Peters, Eds. Liss, New York, 1977. xvi, 306 pp. \$34. Laboratory and Research Methods in Biology and Medicine, vol. 1. To order this book circle No. 427 on Readers' Service Card.

**Rockslides and Avalanches.** Part 1, Natural Phenomena. Barry Voight, Ed. Elsevier, New York, 1978. xviii, 834 pp., illus. \$98. Developments in Geotechnical Engineering, 14A.

**2nd International Symposium on Rapid Methods and Automation in Microbiology.** Cambridge, England, Sept. 1976. H. H. Johnston and S. W. B. Newsom, Eds. Research Studies Press, Forest Grove, Ore., 1977 (distributor, ISBS, Forest Grove, Ore.). xii, 318 pp., illus. \$49.50. To order this book circle No. 420 on Readers' Service Card.

**75 Jahre Quantentheorie.** Festband zum 75. Jahrestag der Entdeckung der Planckschen Energiequanten. Papers from a colloquium, Berlin, Dec. 1975. Wolfram Brauer, Hans-Waldemar Streitwolf, and Kurt Werner, Eds. Akademie-Verlag, Berlin, East Germany, 1977. 306 pp. + plates. Paper, 42 M. Abhandlungen der Akademie der Wissenschaften der DDR, Jahrgang 1977, No. 7N.

**Sign Language of the Deaf.** Psychological, Linguistic, and Sociological Perspectives. I. M. Schlesinger and Lila Namir, Eds. Academic Press, New York, 1978. xiv, 380 pp., illus. \$22.

**Social Change and Scientific Organization.** The Royal Institution, 1799-1844. Morris Berman. Cornell University Press, Ithaca, N.Y., 1978. xxviii, 224 pp., illus. \$17.50.

**Solid Electrolytes.** S. Geller, Ed. Springer-Verlag, New York, 1977. xii, 230 pp., illus. \$33.20. Topics in Applied Physics, vol. 21. To order this book circle No. 421 on Readers' Service Card.

**Stress Waves in Non-Elastic Solids.** W. K. Nowacki. Translated from the Polish edition (Warsaw) by Zbigniew Olesiak. Pergamon, New York, 1978. xii, 246 pp., illus. \$25. To order this book circle No. 422 on Readers' Service Card.

**Tay-Sachs Disease.** Screening and Prevention. Papers from a conference, Palm Springs, Calif., Dec. 1975. Michael M. Kaback, David L. Rimoin, and John S. O'Brien, Eds. Liss, New York, 1977. xvi, 434 pp., illus. \$45. Progress in Clinical and Biological Research, vol. 18. To order this book circle No. 428 on Readers' Service Card.

**Topics and Terms in Environmental Problems.** John R. Holum. Wiley-Interscience, New York, 1977. xii, 730 pp., illus. \$24.

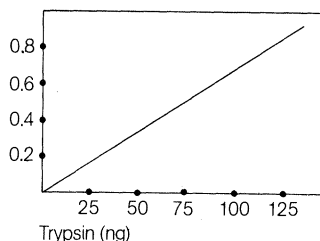
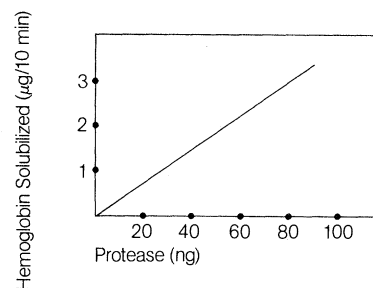
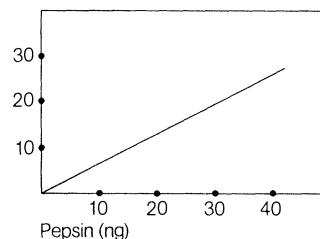
**Underwater Warfare in the Age of Sail.** Alex Roland. Indiana University Press, Bloomington, 1978. xviii, 238 pp., illus. \$16.50.

**The Wernerian Theory of the Neptunian Origin of Rocks.** A Facsimile Reprint of *Elements of Geognosy*, 1808, by Robert Jameson. Hafner (Macmillan), New York, and Collier Macmillan, London, 1976. xe, 368 pp. + index. \$25. Contributions to the History of Geology, vol. 9.

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Send for reprint of: Buckley, L. and Beres, L.,  
"Studies on the Stability of Tritium-Labeled  
Polyuridylic Acid and Polyadenylic Acid."  
Anal. Biochem. **84**, 319, (1978).

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# Personnel Placement

## POSITIONS WANTED

**Biologist (Microbiology)**, B.S. Broad interests and research experience with fungi, bacteria, toxins: pathogenicity, culture, therapy. Seeks position as an assistant in applied/basic research/development program in South or Southwest. Résumé and references upon request. Box 264, SCIENCE. X

**Biomedical Engineer**, M.D., B.S. chemical engineering. Seeking research position in university or industry. Broad interests include computer modeling and environmental health. Strong academic background. Research experience. Box 270, SCIENCE. X

**Crystallographer**, Ph.D. 1974, with postdoctoral experience; seeks permanent position working independently in x-ray crystallography. Box 278, SCIENCE. 8/25; 9/1, 8

Mature person, education and experience in **Interdisciplinary Sciences**; experimental and theoretical; scientific leadership and administrative experience; domestic or foreign assignment; teaching. Box 279, SCIENCE. X

**Medicinal Chemist**, Ph.D., 15 years research experience. Desires challenging position in toxicology or environmental health in N.Y.-N.J. metropolitan area. Salary: open. Box 277, SCIENCE. X

Entry level position wanted immediately. Ph.D. **Pharmacologist/Organic Chemist**. Box 271, SCIENCE. 8/25; 9/1, 8

## POSITIONS OPEN

### ASSISTANT PROFESSOR

The Salk Institute is seeking candidates for basic research positions at the assistant professor level in the area of cell differentiation and developmental biology related to cancer. Candidates are expected to establish their own research programs and seek outside funding. Candidates should send curriculum vitae, publication list, names of references, and a description of proposed research to:

**Dr. Walter Eckhart, Director**  
Armand Hammer Center for Cancer Biology  
The Salk Institute  
P.O. Box 1809  
San Diego, California 92112

*The Salk Institute is an Equal Opportunity Employer, M/F.*

### UNIVERSITY OF GUELPH College of Biological Science DEPARTMENT OF NUTRITION

Applications are invited for the position of **ASSISTANT PROFESSOR OF NUTRITION**. Candidates should have training in experimental nutrition or nutritional biochemistry. The successful applicant will participate in teaching the metabolic aspects of nutrition at the undergraduate and graduate levels, and must be prepared to undertake research on the biochemical aspects of fish nutrition. Curriculum vitae and names of three references should be sent to: **Dr. H. S. Bayley, Chairman, Search Committee, Department of Nutrition, University of Guelph, Guelph, Ontario, Canada N1G 2W1** by 16 October 1978. Appointment subject to final budgetary approval.

**ASSISTANT PROFESSOR IN RESEARCH PEDIATRICS** to conduct research on behavioral correlates of induced metabolic abnormalities in animals. Ph.D. in physiological psychology or closely related field with strong background in psychopharmacology and developmental aspects of drugs and nutrition on behavior. Apply to: **Professor H. K. Berry, Director, Division of Inborn Errors of Metabolism, Children's Hospital Research Foundation, Cincinnati, Ohio 45229**. An Equal Opportunity Employer, M/F.

## POSITIONS OPEN

### UNIVERSITY OF MICHIGAN

The Neurology Services at the Ann Arbor Veterans Administration (VA) Hospital and the Department of Neurology at the University of Michigan are seeking **ACADEMIC CLINICAL NEUROLOGISTS** for one full- and one part-time position at the Ann Arbor VA Hospital. The positions include responsibilities in patient care, teaching, research, and administration. Appointments will carry academic titles in the Department of Neurology at the University of Michigan. Opportunity exists for the part-time appointee to work at the University Hospital. Individuals with training in neuroanatomic (light microscopy or EM), neuroimmunologic, and/or central nervous system regeneration research are especially sought. All candidates must meet requirements for employment by the Veterans Administration. Please send all inquiries with curriculum vitae and two letters of recommendation to: **Earl R. Feringa, M.D., Professor of Neurology, Chief of Neurology, Ann Arbor VA Hospital, 2215 Fuller Road, Ann Arbor, Mich. 48105**. The University of Michigan and the Veterans Administration are nondiscriminatory, Affirmative Action/Equal Opportunity Employers.

### ASSISTANT PROFESSOR

The Chesapeake Biological Laboratory of the University of Maryland Center for Environmental and Estuarine Studies seeks an assistant professor to develop a program in the chemistry of pollutants in estuarine sediments. A Ph.D. is required for this tenure-track position. Applicants should submit letters of application and résumés, and arrange for three letters of reference to be sent no later than 30 September to:

**Chairman, Search Committee**  
Chesapeake Biological Laboratory  
Solomons, Maryland 20688

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### ASSISTANT PROFESSOR— CELLULAR IMMUNOLOGY

Applications are invited from candidates with a strong background in cellular immunology to study the virus-host and tumor-host relationship in bovine leukemia virus infected cattle. Minimum qualifications are a Ph.D. or D.V.M. degree. Applicants should submit curriculum vitae, copies of representative publications and the names of three referees to:

**Dr. J. F. Ferrer**  
Chief, Section of Viral Oncology  
University of Pennsylvania School of  
Veterinary Medicine  
New Bolton Center  
R.D. 1  
Kennett Square, Pa. 19348

*The University of Pennsylvania is an Equal Opportunity Employer.*

University of California, Irvine, Department of Pediatrics, is recruiting at the **ASSISTANT PROFESSOR** level for a **CLINICAL GENETICIST** (line or in-residence series). Requirements: M.D. degree, Board-eligibility or -certification in pediatrics; strong evidence of research potential; experience teaching in academic medical center in interdisciplinary allied health programs; 1- or 2-year fellowship in clinical genetics following completion of pediatric residency. Prefer applicants with background in population or behavioral genetics. *Women and minorities are encouraged to apply. All candidates welcome.* Send curriculum vitae and three references to: **Kenneth W. Dumars, M.D., Department of Pediatrics, University of California Irvine, Irvine, California 92717**, by 1 October 1978.

**BIOCHEMIST**—Senior postdoctoral position: requires experience in enzyme purification and characterization. Position is for 1 year, although it may be renewed. Candidates should send curriculum vitae, including summary of pertinent experience, and names of three individuals who may be contacted for references to: **Dr. W. E. Barnett, Director, University of Tennessee-Oak Ridge Graduate School of Biological Sciences, Biology Division, Oak Ridge National Laboratory, P.O. Box Y, Oak Ridge, Tenn. 37830**. An Equal Opportunity/Affirmative Action Employer.

## POSITIONS OPEN

Department of Chemistry at Purdue University invites applications for a tenure-track position of **ASSISTANT PROFESSOR OF BIOCHEMISTRY** starting August 1979. Candidates with a Ph.D. in biochemistry and some postdoctoral experience are preferred. Exceptional promise in teaching (both at graduate and undergraduate level) and in research are primary requirements. Curriculum vitae, a short summary of research plans, and three letters of recommendation should be sent to: **Dr. Dale W. Margrum, Head, Department of Chemistry, Purdue University, West Lafayette, Indiana 47907** by 1 December 1978. *Purdue University is an Equal Opportunity/Affirmative Action Employer.*

**ASSISTANT PROFESSOR OF PATHOLOGY**. Medical school in Northeast seeks applications from cellular immunologists engaged in research on lymphocyte differentiation. Experience in production of antisera against lymphocyte surface markers, tissue culture, and murine immune responses essential. Applicant should be willing to work with others on related research programs. Annual salary: \$18,000. Send curriculum vitae and references to:

**Box 276, SCIENCE**

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**ASSISTANT PROFESSOR OF PLANT AND SOIL CHEMISTRY**. This is a tenure-track, fiscal year, joint research (80 percent) and teaching (20 percent) appointment. The person in this position will be in charge of the department's analytical laboratories, and will also have the opportunity to do research in the areas of analytical methods, soil-plant relationships, and environmental chemistry. The analytical laboratories perform inorganic analyses of soils, plants, water, and organic wastes for the Department of Plant and Soil Sciences, other institutional units in the university, and for industries in Maine. Laboratory responsibilities include supervision of three laboratory assistants or technicians. Opportunities exist for close cooperation with colleagues in agronomy, horticulture, forestry, and other disciplines. The teaching responsibility of the person in this position includes a graduate level course in spectrochemical analysis. Dependent upon training and inclination of the individual, one additional course may be added to the teaching duties. A Ph.D. with strong training in analytical chemistry is required. Training or experience in plant, soil, water, or waste analysis is desirable. In addition, training and/or experience in electronics and instrumentation would be beneficial. Salary commensurate with training and experience. Starting date is 1 January 1979. Closing date for applications is 1 October 1978. Send letters of application, résumés, transcripts, names of three references, and other pertinent information such as reprints to: **Dr. S. M. Goltz, Chairman, Department of Plant and Soil Sciences, University of Maine, Orono, Maine 04473**. An Affirmative Action/Equal Opportunity Employer.

The University of California, San Diego, solicits applicants for the position of **DIRECTOR** for a new undergraduate pre-medical program being developed by Warren College and the School of Medicine under an award from the Commonwealth Fund. The program will include medically related social science and science courses, and an intensive independent study program, in addition to the basic biological science core. It will also develop courses for several health-care-related minors of interest to majors in other fields.

Applicants for the directorship should have the appropriate advanced degrees and scholarly credentials for appointment to the faculty of the School of Medicine and/or a general campus department. It is expected that the directorship will be a half-time position, with the remaining part of the individual's time spent as a regular faculty member. Thus, the director should either be a health care professional, with academic interests beyond a professional specialty, or an academic scholar with interests in the area of health care.

Academic rank and salary commensurate with qualifications and experience.

Send letter of application, résumé, and names of three references to:

**M. L. Rudee**  
Provost, Warren College, Q-022  
University of California, San Diego  
La Jolla, Calif. 92093

Applications should be received by 15 September 1978. *The University of California, San Diego, is an Equal Opportunity/Affirmative Action Employer.*

## POSITIONS OPEN

**ASSISTANT PROFESSOR OF BOTANY.** Ph.D. in higher plant physiology required. Postdoctoral training and familiarity with biochemical experimentation preferred. Duties include teaching undergraduate and graduate courses in plant physiology, developing a research program, and directing graduate students. Twelve-month (can begin January 1979 or later), tenure-track position. By 15 October 1978, send résumé, transcripts, statement of research interests, and three letters of recommendation to: **Dr. R. C. Fites, Chairperson, Search Committee, Department of Botany, North Carolina State University, Raleigh, N.C. 27650.** An Equal Opportunity/Affirmative Action Employer.

University of California, Los Angeles (UCLA), School of Medicine seeks appropriate candidates for the **DELLA MARTIN CHAIR IN PSYCHIATRY**, newly endowed professorship for distinguished academic psychiatrist (English-speaking, eligible California licensure) committed to research especially on major mental illnesses of adolescents and young adults. *Equal Opportunity/Affirmative Action Employer.* Send curriculum vitae, letter discussing career goals, and five references to:

**Arnold B. Scheibel, M.D., Chairman  
Della Martin Search Committee  
760 Westwood Plaza  
Los Angeles, California 90024**

### CHAIRMAN DEPARTMENT OF OBSTETRICS AND GYNECOLOGY GEORGETOWN UNIVERSITY SCHOOL OF MEDICINE

The school is searching for a new chairperson for this important clinical department who will also be chief of the Obstetrical and Gynecologic Service of Georgetown University Hospital and director of the residency program. The department has several affiliated services including the District of Columbia General Hospital. Applicants should be experienced in the clinical specialty, teaching at the undergraduate and postgraduate levels, and in research. *Georgetown University is an Affirmative Action/Equal Opportunity Institution in employment and admissions.* Letters from interested persons or proposals for the position should be addressed to:

**John C. Harvey, M.D.  
Chairman, Obstetrics/Gynecology Search Committee  
Georgetown University Hospital  
Washington, D.C. 20007**

### CHAIRMAN DEPARTMENT OF NEUROSCIENCE

The University of Florida College of Medicine seeks a distinguished individual to succeed Dr. Frederick A. King as professor and chairman of neuroscience. Applicants should possess the M.D. and/or Ph.D., have an outstanding record of accomplishment in research, and a clear commitment to both medical and graduate education. Applications should include curriculum vitae, bibliography, and names of at least four references, and should be sent before 1 October 1978 to:

**Dr. L. William Clem  
Chairman, Neuroscience Search Committee  
Box J-266, JHMHC  
University of Florida  
Gainesville, Florida 32610**

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

**CHAIRPERSON—BIOLOGY.** Applications and nominations are invited for the position of chairperson of the Department of Biological Sciences, Wichita State University. The university is located in a metropolitan area of about 300,000 people and enrolls more than 15,000 students. The department, with 16 full-time faculty, is housed in a new building and offers the B.A., B.S., and M.S. degrees. A Ph.D. program is not anticipated. There are approximately 200 majors and 40 graduate students in the department. Candidates should have the Ph.D., experience in university teaching, a strong record of scholarly achievement, and evidence of or potential for academic and administrative leadership. Rank and salary will be commensurate with qualifications. A letter of interest, a résumé, and the names of at least three references should be sent by 30 September 1978 to: **Chairperson Selection Committee, Department of Biological Sciences, Wichita State University, Wichita, Kansas 67208.** *Wichita State University is an Affirmative Action Employer and operates under Affirmative Action policy. Applications from minority persons and women are encouraged.*

## POSITIONS OPEN

**BIOCHEMISTRY POSTDOCTORAL** position is available to study the biosynthesis, protein chemistry, topography, and functional reconstitution of membrane enzymes. Appointment is for a minimum of 2 years. Applicants having experience in at least one of these areas should send curriculum vitae and names of three references to: **Dr. Ronald R. Fisher, Chairman, Department of Chemistry, University of South Carolina, Columbia, S.C. 29208.** An Affirmative Action/Equal Opportunity Employer.

### CLINICAL CHEMIST/TOXICOLOGIST

An excellent opportunity is available in a 500 plus bed, acute care hospital for a Ph.D. with clinical chemistry experience and an interest or experience in toxicology.

The individual selected will work with a team of 11 pathologists and Ph.D.'s in an ultra modern hospital laboratory that employs 140 professionals. Responsibilities will include organization and development of toxicology section in association with experienced clinical chemist.

Salary is negotiable and benefits include 3 weeks paid vacation after 1 year, 120-day sick leave plan, life insurance, long-term disability plan, paid comprehensive health insurance, paid holidays, personal days, and paid retirement plan.

Please send curriculum vitae stating qualifications and salary expectations to:

**S. E. Stuart, Ph.D.  
Administrative Coordinator  
Department of Laboratories  
E. W. Sparrow Hospital  
1215 East Michigan Avenue  
Lansing, Michigan 48909**

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**COMPARATIVE ANIMAL PHYSIOLOGIST**—Applications are invited for a tenure-track assistant professor position available from September 1978 until filled. Teaching responsibilities include: (i) a course in comparative animal physiology at the senior/graduate level, and (ii) a portion (one quarter) of freshman biology dealing with organismal physiology. The candidate is expected to participate actively in senior research and in graduate programs (M.S./Ph.D.) and to develop and maintain an active research program. Required: Ph.D. and postdoctoral training. Teaching experience preferred. Salary up to \$15,000 for 9 months. A seed grant of \$4,000 plus much departmental equipment available. Send curriculum vitae and have three letters of recommendations sent to: **Dr. Woon H. Jyung, Chairman, Department of Biology, University of Toledo, Toledo, Ohio 43606.** *Affirmative Action/Equal Opportunity Employer.*

### CURATORIAL TRAINEE/MAMMALOLOGY

The Department of Mammalogy of the New York Zoological Society invites qualified applicants, who should possess an advanced degree, to apply for the position of curatorial trainee in mammalogy.

Responsibilities will include establishment of care and feeding techniques, managing a large staff, designing exhibits, and writing for technical and popular audience.

Applicants should send curriculum vitae to:

**James B. White  
Personnel Supervisor  
New York Zoological Society  
185th Street and Southern Boulevard  
Bronx, New York 10460**

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### NOW RECRUITING FOR DEAN, SCHOOL OF OPTOMETRY

The University of California, Berkeley, invites applications/nominations for the position of dean of the School of Optometry. Qualifications for the deanship include evidence of scholarly and academic achievement in visual sciences that warrant an appointment to the full professorship on the faculty of the school. The dean is expected to provide leadership within the school in presenting concepts for curriculum development and to encourage research and professional programs to meet community needs. Application must be received by 1 October 1978. Detailed curriculum vitae, references, and a statement of personal interests regarding the post should be sent to: **Search Committee, Office of the Provost, Professional Schools and Colleges, 200 California Hall, University of California, Berkeley, Calif. 94720.**

*The University is an Equal Opportunity/Affirmative Action Employer.*

## POSITIONS OPEN

### CARDIOVASCULAR INVESTIGATOR

To join active research program as postdoctoral fellow or research associate in large teaching hospital. Prefer Ph.D. with broad training. Previous work with conscious animals or radioimmunoassay helpful. Medical school appointment possible. Send curriculum vitae and names of three references to: **Kenneth L. Goetz, M.D., Ph.D., Division of Experimental Medicine, St. Luke's Hospital, Kansas City, Missouri 64111.**

### DEAN OF SCIENCE

The University of British Columbia invites applications and nominations for a dean of science responsible for administering a faculty of nine departments (botany, chemistry, computer science, geological sciences, geophysics and astronomy, mathematics, microbiology, physics, and zoology), with undergraduate and graduate programs, and 350 full-time faculty members.

The appointment will be effective 1 July 1979 or as soon as possible thereafter, and is for a term of 6 years, renewable at the pleasure of the Board of Governors on the recommendation of the president. The university seeks names of candidates, with administrative experience, who have established reputations within the areas represented in the faculty. *The university offers Equal Opportunity for Employment to qualified male and female candidates.*

Applications and nominations should be sent, before 30 November 1978, to:

**Dr. D. Harold Copp  
Medical Science Block A, Room 211  
The University of British Columbia  
2075 Wesbrook Mall  
Vancouver, British Columbia, Canada V6T 1W5**

**DIRECTOR.** Research Institute of Pharmaceutical Sciences, School of Pharmacy, University of Mississippi. Requirements: doctorate in biomedical or physical sciences. Qualifications: experience in research administration with demonstrated record of funded research and publications. Responsibility: to direct the further development and growth of a dynamic multidisciplinary research institute presently supported by state, federal, and private funds. Salary: commensurate with qualifications. Available after 1 January 1979. Application deadline: 1 November. Contact: **Joe B. McCaskill, Associate Dean, Chairman, Search Committee, School of Pharmacy, University of Mississippi, University, Miss. 38677.** *Equal Opportunity Employer, M/F/H.*

**DIRECTOR, CENTER FOR GREAT LAKES STUDIES (CGLS).** University of Wisconsin-Milwaukee (UWM). CGLS, a graduate school unit, serves UWM, enabling faculty and students to engage in physical, biological, and sociological research, engineering, and management studies related to the Great Lakes. Qualifications: Ph.D. or equivalent in science or engineering; outstanding research in one or more branches of lake or ocean science or technology; leadership experience in development and management of aquatic (including interdisciplinary) programs. Duties include: teaching and research; development and promotion of programs enabling research; operation (with assistance of associate director) of the UW System Great Lakes Research Facility, regional laboratories, and research vessel base. Salary commensurate with qualifications and experience. Send applications or nominations by 1 October 1978 to: **Dean George W. Keulks, Graduate School, University of Wisconsin-Milwaukee, Milwaukee, Wisconsin 53201; telephone: 414-963-5483.** *An Equal Opportunity/Affirmative Action Employer.*

### DIRECTOR, CENTER FOR RESEARCH IN PERIODONTAL DISEASES

The University of Illinois, College of Dentistry, invites applications from a D.D.S., Ph.D., or holder of equivalent qualifications, with significant specialist experience in periodontology. The appointee will establish and direct a Center for Research in Periodontal Diseases. Candidates should have an established reputation in research related to periodontal diseases and should also have demonstrated effective leadership of a research team. The college and this campus of the University of Illinois afford excellent opportunities for collaborative research.

The level of salary and academic rank will be commensurate with professional experience. Send curriculum vitae, personal bibliography, and references to: **Dr. J. P. Waterhouse, Chairman, Search Committee for Director, Center for Research in Periodontal Disease, University of Illinois, College of Dentistry, P.O. Box 6998, Chicago, Illinois 60680.** *The University of Illinois is an Equal Opportunity/Affirmative Action Employer.*

## POSITIONS OPEN

**CHAIRMAN OF DEPARTMENT OF PHARMACOLOGY.** The University of California, San Francisco, is searching for a candidate for the position of professor and chairman of the Department of Pharmacology. Address inquiries to: **Lloyd H. Smith, Jr., M.D., Department of Medicine, Room 994-M, University of California, San Francisco, Calif. 94143.** *The University of California is an Equal Opportunity/Affirmative Action Employer.*

**LABORATORY DIRECTOR,** Plant, Soil and Nutrition Research Laboratory. Assignment includes laboratory direction and the conduct of pioneering research in nutritional quality of food and feed or in the movement of essential tract elements in soil-plant-animal cycles. A Ph.D. relating to plant or animal nutrition is desirable with evidence of outstanding research experience in appropriate subject-matter field. (GS 14/15, \$30,750 to \$36,171, career Civil Service position.) For further details, a copy of the position announcement, and an application for federal employment (SF-171), contact: **Dr. J. B. Wilson, Area Director, U.S. Plant, Soil and Nutrition Research Laboratory, Tower Road, Cornell University, Ithaca, New York 14853.** Send completed application to: **Cathleen Enuton, USDA, SEA, NER, Personnel Branch, Building 004, Room 105, BARC-West, Beltsville, Maryland 20705.** *An Equal Opportunity Employer.*

**DIRECTOR OF ANATOMIC PATHOLOGY**—The University of Massachusetts Medical School seeks a top-level pathologist who will assume direct responsibility for surgical and autopsy pathology. Academic status of full professor. *Applications from women and minority groups are especially welcome.* Write to: **Dr. G. Majno, Department of Pathology, UNIVERSITY OF MASSACHUSETTS MEDICAL SCHOOL, 55 Lake Avenue North, Worcester, Mass. 01605.** *An Equal Opportunity/Affirmative Action Employer.*

### DIRECTOR OF RESEARCH Zoecon Corporation

Zoecon seeks a **director of research** with distinguished international technical experience in the development of innovative new approaches to the control of pests, including insects, fungi, bacteria, and weeds. Candidates must possess creativity, knowledge, experience, and vision broad enough to formulate new concepts for the development of better pest control agents. Candidates must have demonstrated extensive successful leadership of a large interdisciplinary research group including synthetic and analytical chemistry, biology, biochemistry and metabolism, and chemical process development. Qualifications should emphasize creative technical leadership above business or administrative responsibilities. Candidates with experience in the biological sciences are preferred; however, chemists with management experience in biological disciplines would qualify.

Zoecon is a division of Occidental Petroleum Corporation with substantial domestic and international operations. Corporate headquarters and corporate research are located in the Stanford University Industrial Park, in close proximity to San Francisco. Submit detailed résumés in confidence to:

**Dr. John D. Diekman**  
Vice President, Research and Development  
Zoecon Corporation  
975 California Avenue  
Palo Alto, California 94304

### EXECUTIVE DIRECTOR AMERICAN GEOLOGICAL INSTITUTE (AGI) Falls Church, Va.

Chief executive and administrative officer responsible for directing operational programs and staff functions, maintaining liaison with 18 member societies, and articulating role of earth sciences in society. Staff of 50 persons. Ph.D. degree in earth-science field preferred; administrative ability and experience; record of science publication and peer recognition. Requires effective communication, wide knowledge of other professional societies and government agencies. Career position with initial 2-year appointment leading to permanent status; standard fringe benefits; salary of \$35,000 to \$48,000 based on experience and qualifications. Available 1 January 1979; application deadline 30 September 1978. Send résumé and application to:

**Dr. William W. Hambleton**  
Chairperson, AGI Search Committee  
Kansas Geological Survey  
Lawrence, Kansas 66044  
Telephone: 913-864-3965

*An Equal Opportunity/Affirmative Action Employer*

## POSITIONS OPEN

### DIRECTOR, HEALTH TRAINING PROGRAM

Responsibility for development and implementation of new post-secondary educational program for training health professionals to work in rural communities.

Qualifications: experience with rural Alaska and budget/personnel management, master's or doctorate in health-related profession. Imagination, skills in writing and program evaluation, plus public relations with Alaskans.

Salary: negotiable. Application deadline: 2 October 1978. Position dependent on funding availability.

Apply to: **Dr. Charles C. Bovee, Sheldon Jackson College, Box 479, Sitka, Alaska 99835.**

*Equal Opportunity Employer*

### FACULTY POSITIONS

College of Medicine  
King Faisal University  
Dammam, Saudi Arabia

Applications are still invited from men and women qualified in:

#### PHYSIOLOGY BIOCHEMISTRY ANATOMY

Particularly need female faculty to teach female students.

Doctorate or equivalent degree required, plus 2 years of teaching/research experience. M.D. degree required for anatomy positions.

Required salary: paid in Saudi Riyals; approximate yearly equivalent in dollars given:

Professor: \$25,469 to \$33,965.  
Associate professor: \$22,779 to \$28,973.  
Assistant professor: \$18,570 to \$22,600.

M.D. degree commands 30 percent or 80 percent higher salary. Taught in English. No Saudi income tax. Teaching starts 15 November 1978. Free furnished housing, airfare for family of four to and from Saudi Arabia; liberal educational allowances for up to four children.

Send complete curriculum vitae plus three references to:

**Dr. Tawfik Tamimi**  
Dean of the Medical Faculty  
King Faisal University  
c/o Saudi Arabian Educational Mission  
2221 West Loop South  
Houston, Texas 77027

**FACULTY POSITIONS** available: four assistant professor positions, Board-qualified (preferably certified) in internal medicine and cardiology. Teaching and research experience necessary in various aspects of cardiology. To remain open until filled. Interested persons contact: **D. T. Mason, M.D., Section of Cardiology, School of Medicine, University of California, Davis, Calif. 95616.** *An Equal Opportunity/Affirmative Action Employer.*

### UNIVERSITY OF PETROLEUM AND MINERALS DHAHRAN, SAUDI ARABIA

The Department of Chemistry, University of Petroleum and Minerals, Dhahran, Saudi Arabia, will have **FACULTY POSITIONS** open for the academic year 1979-1980, starting 1 September 1979 to teach in the undergraduate department with a developing graduate program. Applications at all rank levels will be considered. Candidates should have teaching and research interests.

Minimum regular contract for 2 years, renewable. Competitive salaries and allowances, air conditioned and furnished housing provided. Free air transportation to and from Dhahran each 2-year tour. Attractive educational assistance grants for school-age dependent children. All earned income without Saudi taxes. Ten months duty each year with 2 months vacation paid and possibility of participation in university's ongoing Summer Program with good additional compensation.

Apply with complete résumé on academic and professional background, list of references, a complete list of publications with clear indication of those papers published in refereed professional magazines/journals, research details, and with copies of transcripts/degrees/testimonials, including personal data such as family status (spouse's name; names, ages, and sex of children), home and office addresses, and telephone numbers to:

**University of Petroleum and Minerals**  
c/o Saudi Arabian Educational Mission  
2223 West Loop South, Suite 400  
Houston, Texas 77027

### THE UNIVERSITY OF TEXAS AT AUSTIN MARINE SCIENCE INSTITUTE DIRECTOR

The University of Texas Marine Science Institute invites applications for the position of director.

The Marine Science Institute is headquartered in Austin, Texas, and has the Galveston Geophysics Laboratory in Galveston, Texas, with extensive research programs in marine geology, marine geophysics, solid earth and planetary geophysics, and the Port Aransas Marine Laboratory in Port Aransas, Texas, with a basic and applied research program in the biological sciences, chemistry, sedimentation, physical oceanography, and engineering. The institute also has a mariculture facility in Port Aransas, Texas, and a field station in St. Croix, U.S. Virgin Islands. The institute conducts research programs throughout the world, has a multidisciplinary graduate teaching program in conjunction with the Department of Marine Studies of the University of Texas at Austin, operates three ships (165-foot, 130-foot, and 85-foot) as well as many smaller vessels, and has a thoroughly diversified marine research program as well as a solid earth and planetary geophysics program.

Candidates should possess recognized scientific credentials, must qualify for a tenure appointment in the Department of Marine Studies, and be capable of dealing with leadership and policy issues. Extensive experience in scientific research in the marine sciences is required. Administrative and teaching experience is important in the selection process. Responsibilities include providing administrative direction for academic and world-wide research programs, coordination of research directions and intellectual and philosophical leadership in continuing the development of an outstanding marine science program.

Application, personal résumé, and the names of at least three referees should be sent to: **H. Eldon Sutton, Vice President for Research, The University of Texas at Austin, Austin, Texas 78712.** The deadline for receipt of materials is 1 October 1978. Do not include materials which must be returned.

*The University of Texas at Austin is an Equal Opportunity/Affirmative Action Employer.*

### University of London

## CHAIR OF PHYSIOLOGY AT UNIVERSITY COLLEGE LONDON

The Senate invites applications for the Second Established Chair of Physiology tenable from 1 October 1979 at University College London in the Department of Physiology, of which Professor D R Wilkie, FRS, is the Head. Applications (10 copies) must be received not later than 30 September 1978 by the Academic Register (S), University of London, Senate House, London WC1E 7HU, from whom further particulars should first be obtained.

## POSITIONS OPEN

### FACULTY POSITION IN ELECTRICAL ENGINEERING-BIOINSTRUMENTATION

A joint tenure-track position in electrical engineering and bioengineering at the University of Illinois at Urbana-Champaign is open starting January 1979. Responsibilities include teaching instrumentation and bioinstrumentation courses and developing an appropriate research program. Candidate must have experience in bioinstrumentation and a Ph.D. rank, preferably assistant professor, with commensurate salary.

Send complete résumé, summary of current research, future plans, transcript, and names of three references to: **Professor Joseph M. Crowley, Chairman, Bioinstrumentation Search Committee, Electrical Engineering Department, University of Illinois, Urbana, Ill. 61801; telephone: 217-333-4732**, by 16 October 1978 for full consideration.

*The University of Illinois is an Affirmative Action/Equal Opportunity Employer and encourages applications from members of minority groups and women.*

**Position: FISHERY BIOLOGIST—POPULATION DYNAMICS**, subject to university tenure rules, Department of Fisheries and Wildlife, Michigan State University.

**Date available:** 1 January 1979.

**Rank and salary:** assistant professor. Salary commensurate with training and experience (12-month basis).

**Responsibilities:** (i) Teach an existing departmental undergraduate course in basic biology/management. (ii) Participate in the development and teaching of a senior level course in fishery biology. (iii) Develop and teach a graduate course in fish population dynamics. (iv) Conduct research on dynamics of fish populations in Michigan waters. Participation in faculty committee work, public service programs, and the advising of students is also expected.

**Qualifications:** Ph.D. in biology with major training in fish population dynamics and general quantitative biology, preferably including systems science. Post-Ph.D. experience in fisheries science desirable. Commitment to teaching, research, and public service. Evidence of ability to obtain research grants, conduct research projects, and publish findings.

**Application:** letter of interest, résumé, three letters of reference, and examples of publications should be sent no later than 1 November 1978 to:

**Dr. Ray J. White  
Search Committee Chairman  
Department of Fisheries and Wildlife  
Michigan State University  
East Lansing, Mich. 48824  
Telephone: 517-355-7493**

*An Equal Opportunity Employer*

**FORMULATIONS CHEMIST**—Ph.D. or M.S. with experience. Basic and applied research to develop methods to formulate, coat, or bind fishery chemicals to meet specific needs in the aquatic environment, to alter solubility, control release rates, improve shelf life, increase degradation rates, and to resist adverse effects of water chemistry. Selective factors include knowledge of surface chemistry, binding properties, solubility and solvent systems, colloid chemistry, cosmetic processing, pelleting, and encapsulation.

Applicants should file SF-171 Application for Federal Employment plus personal qualifications statement, transcripts, and list of publications to: **Director, National Fishery Research Laboratory, Box 818, La Crosse, Wisconsin 54601. Telephone: 608-784-9666.**

*An Equal Opportunity Employer*

### GENETICS

Applications are invited for an associate professorship in the area of **theoretical quantitative/population genetics**. Position involves 70 percent research and 30 percent instruction on a 12-month basis effective 1 July 1979. Applicants must have demonstrated excellence in research and teaching. Individual will be expected to develop a strong research project and participate in our teaching program.

Send letter of application, curriculum vitae, and three letters of reference to:

**John G. Scandalios, Head  
Department of Genetics  
North Carolina State University  
P.O. Box 5487  
Raleigh, North Carolina 27650**

*North Carolina State University is an Affirmative Action/Equal Opportunity Employer.*

## POSITIONS OPEN

### TEXAS A & M UNIVERSITY

Texas A & M University is currently seeking a qualified individual to update the publication, *Forest Trees of Texas*. This will be a 2-year appointment beginning September 1978. Annual salary: \$12,000. Requirements include a Ph.D. in the taxonomic sciences and a strong journalism background. Interested applicants should contact: **Employment Manager, Personnel Department, Texas A & M University, College Station, Texas 77843.**

*Equal Employment Opportunity through Affirmative Action*

**GYNECOLOGIC ONCOLOGY** faculty position with the Department of Obstetrics and Gynecology, and the Cancer Center, of the University of Rochester Medical Center. This position offers solid opportunity for optimal patient care and meaningful research. Patients undergo the full range of surgical, radiotherapeutic, and chemotherapeutic therapies. Many correlated basic science and clinical research opportunities exist within the department, the medical school, and the Cancer Center. Short-term (2- and 3-year) and traditional sabbatical leaves will be available. For full information please address inquiries to: **Jackson B. Beecham, M.D., Assistant Professor of Oncology, Department of Obstetrics and Gynecology, Box 668, University of Rochester School of Medicine and Dentistry, 601 Elmwood Avenue, Rochester, New York 14642.**

*An Equal Opportunity Employer, M/F*

**IMMUNOLOGIST**—Position open for a Ph.D. or M.D. at the Assistant Professor level. Joint appointment available in Department of Medicine for M.D. Candidate should be able to conduct active research program contributing to departmental interests in cellular and molecular biology. Participation in graduate and medical teaching required. Send correspondence to: **Dr. Morton M. Weber, Department of Microbiology, St. Louis University School of Medicine, 1402 South Grand Boulevard, St. Louis, Missouri 63104. Equal Opportunity/Affirmative Action Employer, M/F/Handicapped.**

**MEDICAL BIOCHEMIST**—Medical college is seeking qualified candidates to teach medical students in an integrated organ-system oriented curriculum. Strong preference will be given to individuals having prior faculty teaching experience. An earned doctorate is required and postdoctoral training is highly desirable. Rank and salary negotiable. Send curriculum vitae and three references to: **Faculty Search Committee, Medical Biology Division, Oklahoma College of Osteopathic Medicine and Surgery, P.O. Box 2280, Tulsa, Oklahoma 74101. An Equal Opportunity/Affirmative Action Employer.**

**MICROSCOPIST RESEARCH ASSISTANT or ASSOCIATE**, depending on qualifications. Immediate full-time opening for an individual with experience in microscopy and photography. Responsibilities will include operation and a role in developing a special type of electron microscope (photoelectron microscope) designed to study cell surfaces and other biological membranes. Minimum requirement: B.S. degree or equivalent experience in microscopy. Experience in electron microscopy desirable. Send curriculum vitae, transcripts, and the names of three references to: **Dr. O. Hayes Griffith, Institute of Molecular Biology, University of Oregon, Eugene, Oregon 97403 by 15 September 1978.**

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

### NEUROPHARMACOLOGIST

Applications are invited from qualified individuals for a position in the Department of Pharmacology, University of Iowa. Appointment will be at the assistant professor level. The appointee must be committed to excellence in teaching and research and will participate in the department's professional and graduate student teaching activities as well as establish an independent research program of high quality. The applicant must have one or more years of postdoctoral training; preference will be given to applicants with research experience in the general area of neurochemistry/neurotransmitters (for example, peptides as neurotransmitters, immunocytochemistry, receptor isolation/identification, and so forth). Interested applicants should send their curriculum vitae and the names of three references to: **Dr. J. P. Long, Chairman, Department of Pharmacology, University of Iowa, Iowa City, Iowa 52242. The University of Iowa is an Equal Opportunity/Affirmative Action Employer.**

## POSITIONS OPEN

**MEDICAL OFFICER (TWO).** Career federal government. Salary range: \$33,835 to \$47,150 depending on qualifications and experience. A medical officer provides medical review of manufacturer-conducted testing or supported research which is purported to substantiate claims of safety for their products. Send SF-171 to: **Marsha Tyler, Consumer Product Safety Commission, Division of Personnel, 5401 Westbard Avenue, Bethesda, Md. 20207. Telephone: 301-492-6500.**

### OCEANOGRAPHY

Applications are invited for an associate scientist position to teach general oceanography at the undergraduate level. Participation in this innovative program includes two 6-week cruises annually aboard the R/V *Westward* where teaching is structured about staff research and student project work. The position can begin before 1 January 1979. Ph.D. required.

Interested individuals will receive a comprehensive information packet by addressing an introductory letter to: **Faculty Search Committee, Sea Education Association, P.O. Box 6, Woods Hole, Mass. 02543.**

*The Sea Education Association operates under the auspices of five colleges and universities and is based in Woods Hole. We are an Equal Opportunity Employer.*

**ORGANIC CHEMIST**, Ph.D., tenure-track assistant professor, September 1979. Teach undergraduates/graduates, develop high quality research program. Curriculum vitae, including publications list, brief account of research interests, three letters of recommendation, and copies of graduate/undergraduate transcripts should be sent by 15 October to: **Professor R. D. Rieke, Department of Chemistry, The University of Nebraska-Lincoln, Lincoln, Neb. 68588. Affirmative Action/Equal Opportunity Employer.**

### PATHOLOGIST

The Food and Drug Administration's National Center for Toxicological Research, Jefferson, Arkansas, has an opening for the following position:

#### CHIEF, DIVISION OF PATHOLOGY

Directs all histopathology, clinical pathology, and related support services operations, and pathological research endeavors of the center. One primary responsibility will be to conduct applied research, either in-house or through contract, to develop techniques to allow as much automation in the pathology operation as possible. D.V.M./Ph.D. or M.D./Ph.D. in pathology is desired along with Board-certification, plus a strong history in animal histopathology, including experience in managing a pathology research operation. Classification at the GS-15 or GS-16 level depends on the qualifications of the candidate. Salary range is \$36,171 to \$47,500. Send résumé and completed Standard Form 171 to:

**National Center for Toxicological Research  
Jefferson, Arkansas 72079  
Attention: Personnel Office  
Building 13, Room 19**

*An Equal Opportunity Employer*

### POSTDOCTORAL ASSOCIATE

Postdoctoral associate in biochemistry available immediately to study mechanisms of biosynthesis of mucin glycoproteins in lung and tumor tissues. Salary dependent on experience, starting at \$12,000. Send curriculum vitae and references to: **Dr. J. Mendicino, Department of Biochemistry, University of Georgia, Athens, Georgia 30602. Equal Opportunity Employer.**

### POSTDOCTORAL FELLOW

Available immediately to study aspects of drug metabolism related to chemical carcinogenesis. Requirements: experience in HPLC and other chromatographic methods of metabolite isolation required. Training should include basic biochemistry, pharmacology, and/or toxicology with some experience in enzymology and/or protein purification. Interested candidates should send curriculum vitae, publication list, thesis, and names of three references to:

**MARIAN L. KNILL  
Recruitment Manager  
Position #1016  
FREDERICK CANCER RESEARCH CENTER  
Litton Bionetics, Inc.  
P.O. Box B  
Frederick, Maryland 21701**

*An Equal Opportunity Employer, M/F*

# EXXON has research opportunities in the Corporate Research Laboratories

Exxon Research and Engineering Company has career opportunities for creative, experienced engineers, chemists, and physical scientists with a strong mathematical background. We are looking for candidates interested in new physical and chemical phenomena and capable of applying their mathematical skills to the definition and experimental confirmations of novel ideas.

*The following qualifications are required:*

- **A strong educational background in engineering, chemical or physical science, with a Doctoral degree.**
- **At least 2-10 years of research experience with a record of recent discoveries.**

*Benefits and opportunities for advancement are excellent.*

If you are interested in these opportunities and have the necessary qualifications, please submit your resume in confidence to: Professional Employment Representative, Department ER 94, Exxon Research and Engineering Company, P.O. Box 45, Linden, N.J. 07036.

EXXON RESEARCH and ENGINEERING COMPANY

# EXXON

We are an equal opportunity employer, m/f

## GEOPHYSICIST U.S. GEOLOGICAL SURVEY GEOLOGIC DIVISION

The U.S. Geological Survey's Branch of Atlantic-Gulf of Mexico Geology at Woods Hole, Massachusetts, is seeking a research geophysicist to plan and conduct pioneering research investigations into advanced seismic techniques for multichannel reflection, wide-angle reflection, and refraction seismic methods on continental shelves, slopes, and rises. These will include deepwater deconvolution methods, source signature enhancement, array techniques, migration, depth conversion, and other imaging techniques. Candidates must possess sound theoretical training in wave propagation, seismic array design, and advanced digital signal processing techniques. Applicants must have a proven research record in developing advanced acquisition or processing techniques in exploration seismology. It is desirable that expertise in exploration seismology be demonstrated through either advanced graduate work, equivalent to Ph.D., or through several years of recent experience as an exploration seismologist.

This position is in the permanent federal career service with all Civil Service benefits. Publication opportunities are assured. Position may be filled at either GS-12 level (\$21,883), GS-13 level (\$26,022), GS-14 level (\$30,750), or GS-15 level (\$36,171); salaries per annum. Position will be located in either Woods Hole, Massachusetts, or Denver, Colorado. Selectee for this position will be subject to conflict of interest regulations relating to holding certain interests in federal lands and in private mineral enterprises, and will not be permitted to perform surveys or examinations for private individuals or corporations.

Interested applicants should submit Personal Qualifications Statement, SF-171, obtainable at U.S. Civil Service Commission offices (résumé will substitute for SF-171), and transcripts by 15 October 1978, to:

**Chief, Recruitment and Placement Section  
U.S. Geological Survey—MS 215 (lp)  
12201 Sunrise Valley Drive  
Reston, Virginia 22092**

All inquiries will be considered confidential. An Equal Opportunity Employer.

## JOINT APPOINTMENTS IN SATELLITE-RELATED OCEANOGRAPHY

Three positions are available carrying joint appointments at the Jet Propulsion Laboratory (JPL) and the Scripps Institution of Oceanography (SIO) for research in a broad area covering the range from ocean-climate interactions and physical/biological oceanography to the development of ocean remote sensing capabilities. These positions will bring together the remote sensing expertise of JPL with the research expertise in oceanography of SIO. At SIO, the appointments will be at the level of Professor (carrying one-third tenure), Adjunct Professor or Research Associate. At JPL, the positions will be on the research staff with ranks comparable to those of the SIO appointments. Appointees will have responsibilities at both institutions. Applicants must meet the normal requirements for an academic appointment, interact effectively with other JPL and SIO scientists, and advise and assist the management of JPL and NASA Headquarters on the long range planning of ocean related programs. Salaries and compensation are negotiable. Inquiries and resumes should be sent to either of the following:

Dr. M. T. Chahine  
Chairman, Oceanography  
Search Committee  
Jet Propulsion Laboratory  
183-301  
4800 Oak Grove Drive  
Pasadena, California 91103

Dr. W. Munk  
Associate Director of IGPP  
Scripps Institution of  
Oceanography  
Mail Code A-025  
La Jolla, California 92093

Telephone: 213-354-2433

Telephone: 714-452-2877

AN EQUAL OPPORTUNITY EMPLOYER.

## POSITIONS OPEN

**PHYSICAL OCEANOGRAPHER**—Associate professor position open for applicant with experience and interest in development and use of new technology in making measurements at sea. Must have Ph.D. in physical sciences and demonstrated ability to conduct independent research and to obtain funding. Duties include teaching and supervision of graduate students. Submit résumé and have three letters of reference sent to: **G. Ross Heath, Dean, School of Oceanography, Oregon State University, Corvallis, Ore. 97331** before 15 October 1978. *An Affirmative Action/Equal Opportunity Employer, in compliance with Section 504, Rehabilitation Act of 1973.*

**POSTDOCTORAL-BIOCHEMIST-NEUROCHEMIST** available immediately to person with neurochemistry background, preferably experience in CNS neurotransmitter technology including receptor-binding techniques. Send résumé and two letters of reference to:

**S. T. Miller  
Cornell University Medical College  
515 East 71 Street, Room 713  
New York, N.Y. 10021**

*An Equal Opportunity/Affirmative Action Employer*

**POSTDOCTORAL FELLOW**—Organic chemist to study cell membrane receptors through photoaffinity labeling. Ph.D. with expertise in carbohydrate chemistry or natural products preferred. Opportunity to gain biochemical experience in mammalian receptor research.

Please submit curriculum vitae to: **A. Eichholz, Ph.D., Department of Physiology, College of Medicine and Dentistry of New Jersey, Rutgers Medical School, P.O. Box 101, Piscataway, New Jersey 08854.** *Equal Opportunity/Affirmative Action Employer, M/F.*

### POSTDOCTORAL POSITION

**MEMBRANE BIOLOGY.** Available immediately for Ph.D. in biochemistry or physiology to study ion transport in isolated and reconstituted cardiac sarcolemmal reticulum. Send curriculum vitae, two references, and supporting materials to: **Dr. F. N. Briggs, Department of Physiology, Medical College of Virginia, Box 608, MCV Station, Richmond, Virginia 23298.** *An Equal Opportunity/Affirmative Action Employer*

**POSTDOCTORAL POSITION.** For research on interaction of chemical carcinogens with liver cells in culture. Recent Ph.D. required. Position available immediately; annual salary: \$13,000. Submit curriculum vitae to: **Gary M. Williams, M.D., Chief, Division of Experimental Pathology, Naylor Dana Institute for Disease Prevention, American Health Foundation, Dana Road, Valhalla, N.Y. 10595.** *An Equal Opportunity Employer, M/F.*

**POSTDOCTORAL POSITION:** available in late fall 1978 for a Ph.D. biochemist trained in enzymology and interested in the regulation of carbohydrate metabolism during cellular differentiation and aging. Candidates should send their curriculum vitae and the names of three references to: **Boston Biomedical Research Institute, Personnel Department, 20 Staniford Street, Boston, Mass. 02114.** *We are an Equal Opportunity/Affirmative Action Employer.*

**POSTDOCTORAL POSITION** available immediately. Physical chemistry of aggregation and micelle properties of bile salts. Experience in analytical ultracentrifugation desirable. \$11,000, renewable. Résumé and three letters of reference to: **J. Kratochvil, Department of Chemistry, Clarkson College, Potsdam, N.Y. 13676.** *An Equal Opportunity/Affirmative Action Employer.*

**POSTDOCTORAL POSITION** available autumn 1978 in Department of Neurology, Yale University, for neuroscientist to participate in ongoing research in cellular pathophysiology of epilepsy and actions of anticonvulsant drugs. Previous experience in microelectrode techniques and machine-language programming desirable. One-year appointment with possibility for extension. Send curriculum vitae and names of references to: **Dr. John Ebersole, Department of Neurology, Yale University School of Medicine, 333 Cedar Street, New Haven, Connecticut 06510.**

A **POSTDOCTORAL POSITION** is available to study mechanisms of action of peptides employing predominantly electrophysiological techniques in mammalian spinal pain pathways. Send curriculum vitae and three references by 1 October 1978 to: **M. Randic, Department of Veterinary Anatomy, Pharmacology and Physiology, Iowa State University of Science and Technology, Ames, Iowa 50011.** *An Affirmative Action/Equal Opportunity Employer.*

## POSITIONS OPEN

**TWO POSTDOCTORAL POSITIONS** available in analysis and assessment of data on chemical and physical toxic agents and development of mathematical and statistical models related to risk assessment. Formal training must include a doctoral degree in mathematics, mathematical biology, toxicology, or statistics. Familiarity with computer applications is highly desirable. Experience in biology, environmental toxicology, or related biological sciences in addition to mathematical biology, modeling, and statistics will be helpful. These team research positions are now available. Send curriculum vitae and request that letters of recommendation be sent by two persons familiar with your recent activities to: **Dr. Marvin Goldman, Radiobiology Laboratory, University of California, Davis, California 95616.**

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

**TWO POSTDOCTORAL POSITIONS** available for research on the control of cyclic AMP levels in cultured human cells. Applicants should have background in cyclic nucleotide methodologies, hormone action, and/or enzyme purification. Please send curriculum vitae and the names and addresses of three references to: **R. W. Butcher, Ph.D., Department of Biochemistry, UNIVERSITY OF MASSACHUSETTS MEDICAL CENTER, 55 Lake Avenue North, Worcester, Mass. 01605.** *An Affirmative Action/Equal Opportunity Employer.*

**POSTDOCTORAL POSITION** available immediately for a Ph.D. having experience and expertise in enzyme purification and characterization. The applicant would be involved in ongoing studies on the mechanism of insulin action on glycogen synthesis and metabolic and abnormalities related to diabetes mellitus. Send curriculum vitae along with names and addresses of three references to: **Dr. Thomas B. Miller, Jr., Department of Biochemistry, UNIVERSITY OF MASSACHUSETTS MEDICAL SCHOOL, 55 Lake Avenue North, Worcester, Mass. 01605.** *An Equal Opportunity/Affirmative Action Employer.*

### POSTDOCTORAL POSITIONS IN RADIATION BIOLOGY

University of California, Berkeley and San Francisco campuses. Faculty affiliated with Donner Laboratory and the Laboratory of Radiobiology. Starting stipend \$10,000 to \$11,500, based on experience. Positions available starting 1 September 1978. Send résumé and letters of reference to: **R. K. Mortimer, Program Director, Radiation Training Grant, Division of Medical Physics, University of California, Berkeley, California 94720.**

**POSTDOCTORAL POSITION** available immediately for studies on mitosis in mutant mammalian cells in culture. Experience in biochemistry and/or electron microscopy desirable. Send curriculum vitae and names of three references to:

**Dr. Richard Wang  
Dalton Research Center  
University of Missouri  
Columbia, Mo. 65211**

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**POSTDOCTORAL RESEARCH ASSOCIATE.** Ph.D. with interests in host-parasite relationships to study immunity to African trypanosomiasis in mice. Salary: \$11,000 to \$13,000; 3-year position. Send curriculum vitae, academic record, and names of three references to: **Dr. G. H. Campbell, Malaria Research Program, University of New Mexico, Albuquerque, New Mexico 87131.** *An Equal Opportunity Employer.*

The Children's Hospital Medical Center (Boston) and Harvard Medical School are searching for an individual to serve simultaneously as a **PROFESSOR OF PSYCHIATRY, CHIEF OF PSYCHIATRY** at Children's Hospital, and **DIRECTOR** of the Judge Baker Guidance Center. This person will be expected to lead a clinical department which provides diagnostic evaluation, inpatient and outpatient consultation; directs treatment; trains child psychiatrists and other mental health personnel; serves as a major resource in the training of nonpsychiatric professionals within the Children's Hospital Medical Center; fosters opportunities for innovative clinical and basic research; teaches medical students child psychiatry; and promotes the importance of meeting the emotional needs of patients and their families within the institution. Applications and nominations should include curriculum vitae, bibliography, and names of references, and should be sent to: **Dr. John Kirkpatrick, Chairman of Search Committee, CHILDREN'S HOSPITAL MEDICAL CENTER, 300 Longwood Avenue, Boston, Mass. 02115.** *An Affirmative Action/Equal Opportunity Employer.*

## POSITIONS OPEN

### TWO POSTDOCTORAL POSITIONS AVAILABLE—RESEARCH IN CARDIOVASCULAR PHYSIOLOGY

1) Ph.D. with background in cardiovascular physiology. Prefer strong knowledge and experience in biochemistry or research with prostaglandins.

or

2) Ph.D. in biochemistry with background in enzymology. Prefer strong knowledge and experience in enzyme purification and prostaglandin synthesis.

Apply to:

**Children's Hospital  
Personnel Department  
730-52nd Street  
Oakland, Calif. 94609**

**POSTDOCTORAL RESEARCH POSITION** available September 1978 for studies on the ultrastructure and evolution of algae. The hypothesis that the chloroplasts in some groups of algae arose from the progressive reduction of an endosymbiotic eukaryotic alga will be tested. Experience in electron microscopy desirable. The position is for 2 years with a starting salary of \$11,880. Please send curriculum vitae and names of three referees to: **Dr. Sarah P. Gibbs, Department of Biology, McGill University, 1205 McGill Avenue, Montreal, Quebec, Canada H3A 1B1.**

### RADIOLOGIST-IN-CHIEF

Applications are invited for the position of radiologist-in-chief, Department of Radiology, Baltimore City Hospitals, Baltimore, Maryland. Individual must be a Board-certified radiologist with a strong interest and background in academic radiology to qualify for an academic appointment of associate or full professor at The Johns Hopkins School of Medicine. Joint residency program and close affiliation with The Johns Hopkins Medical Institutions. Interested applicants should mail curriculum vitae and bibliography to the chairman of the search committee: **Dr. Martin W. Donner, Chairman, Department of Radiology and Radiological Science, The Johns Hopkins Hospital, Baltimore, Maryland 21205.** *An Equal Opportunity Employer*

**RESEARCH ASSISTANT PROFESSOR**—Position available to conduct research on differentiation and growth of salivary glands. Applicant must have training and experience in electron microscopy. Rank will be at the research assistant professor level. Send curriculum vitae and names of three references to: **T. Barka, M.D., Department of Anatomy, THE MOUNT SINAI SCHOOL OF MEDICINE, 100th Street and Fifth Avenue, N.Y., N.Y. 10029.** *An Equal Opportunity Employer.*

### RESEARCH ASSOCIATE—AGRONOMY

Available 1 September 1978. Temporary, annual, assistant-rank position on weed biology and physiology. Requires basic knowledge of plant physiology and herbicide response. Knowledge and experience in crop production desired. Salary: \$15,000 per year. Send résumé, transcripts, and names and addresses of three persons who have been asked to submit letters of reference by 30 September 1978 to: **Dr. R. A. Norton, Superintendent, Northwest Washington Research and Extension Unit, Mount Vernon, Wash. 98273; telephone: 206-424-6121.** *An Equal Opportunity/Affirmative Action Employer. Women, minorities, and handicapped persons are encouraged to apply and identify themselves as such in their applications.*

**RESEARCH ASSOCIATE.** Physiologist to study excitation contraction coupling and muscle mechanics of isolated single cardiac cells. Ph.D. is required. Experience in microscopy and micromanipulation of single cells or small preparations is desirable. Experience in tissue culture techniques is also desirable. Send curriculum vitae and relevant reprints to: **Page A. W. Anderson, M.D., Box 3218, Duke University Medical Center, Durham, North Carolina 27710.** *An Affirmative Action/Equal Opportunity Employer.*

**RESEARCH IN NITROGEN FIXATION.** Postdoctoral or research associate position available for molecular biologist, biochemist, or microbiologist to participate in research on plant gene expression during symbiotic nitrogen fixation. Experience with mRNA, cDNA, and protein synthesis would be an asset. Initial appointment can be for up to 3 years with a starting salary of \$11,600 to \$13,735, depending on qualifications. Apply to: **Dr. H. M. Schulman, Lady Davis Institute, 3755 Cote Sainte Catherine Road, Montreal, Canada H3T 1E2.**

## CARDIOVASCULAR RESEARCH LEADER

SmithKline Corporation, a diversified multinational pharmaceutical firm located in Philadelphia, Pennsylvania is seeking a dynamic and creative person to head up its Cardiovascular Research effort.

The successful candidate will be required to manage a large, drug-discovery oriented group engaged in on-going cardiovascular-renal research. Offering an opportunity to exercise an aggressive role within this multi-disciplinary team, the position requires an individual who can initiate additional approaches in the search of novel drugs for use in the treatment of cardiovascular diseases.

This significant position, requires a polished investigator who has 5 to 10 years industrial experience beyond the PhD in Pharmacology. Additionally, the candidate should have demonstrated expertise in hypertension.

SmithKline offers an excellent compensation and benefits program, along with opportunity for personal and professional growth. Please send resume with salary history to: Mr. W. G. Groves, SMITH KLINE & FRENCH LABORATORIES, A Division of SmithKline Corporation, 1504 Spring Garden Street, P.O. Box 7929, Philadelphia, Pennsylvania 19101. We are an equal opportunity employer, male/female/handicapped/veteran.

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## DEAN— VETERINARY MEDICINE

The University of Wisconsin—Madison invites applications and nominations for the position of Dean of the recently approved School of Veterinary Medicine. Funds have been appropriated by the Legislature to develop preliminary plans for curriculum, admissions policies, and physical facilities. Such plans will be submitted for full funding in January 1979.

Candidates should hold the D.V.M. and Ph.D. degrees and have a record of scholarly achievement, teaching, and clinical or other appropriate professional experience sufficient to qualify them for tenured rank in the University faculty. They should be able to provide leadership in the development of the new professional curriculum, physical facilities, and clinical resources, as well as in the conduct of research, graduate education, and continuing education in Veterinary Science, to which the University has long had and will maintain a strong commitment. They should be able to represent the programs of the School effectively to public, professional, and private agencies at state and national levels.

Applications and nominations with supporting material will be accepted until November 1, 1978. They should be sent to:

**Dr. George Zograf**  
Chairman, Search Committee  
166 Bascom Hall  
University of Wisconsin—Madison  
Madison, WI 53706

The University of Wisconsin—Madison is an Equal Opportunity/Affirmative Action Employer and encourages applications from women and members of minority groups.

## Toxicologists

G.D. Searle is currently seeking qualified individuals for its Product Safety Assessment Department. Positions available are:

### RESEARCH INVESTIGATOR

Qualified candidates should possess a Ph.D in toxicology, pharmacology or related discipline. This individual will be responsible for developing protocols and reviewing, interpreting, and reporting data generated from pre-clinical safety studies. In addition, this position provides an opportunity for basic research in Biochemical Toxicology.

### RESEARCH TOXICOLOGIST

Qualified candidates should possess an M.S. in toxicology, pharmacology, or related discipline. This individual will be responsible for supervising, implementing, and reporting pre-clinical safety studies.

G.D. Searle provides an excellent salary and benefits package. To arrange a confidential interview send your resume with salary history and requirements to:

**Peter J. Vozas**

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## POSITIONS OPEN

**RESEARCH ASSOCIATE.** Recent Ph.D. graduates.  
(i) Expertise in algal ecology, culturing, physiology.  
(ii) Expertise in analytical chemistry of trace metals in seawater, oceanography. Salaries: \$11,000 to \$13,000 depending on background. Send résumé and three letters of reference to: **E. E. Granger, 138-78, California Institute of Technology, Pasadena, Calif. 91125.** An Equal Opportunity Employer, M/F.

## RESEARCH SCIENTISTS

An expanding biomedical research firm in suburban Washington, D.C., currently has positions available for qualified professional senior and technical personnel, in the following disciplines:

**Immunology-Immunochemistry  
Radio-Immunochemistry  
Oncogenic Virology-Cell Biology  
Lipid Biochemistry**

At least 2 years of postdegree experience preferred. Interested individuals should submit references, salary requirements, and curriculum vitae in complete confidence to:

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6715 Electronic Drive  
Springfield, Virginia 22151  
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**SUPERVISORY TOXICOLOGIST**—Career federal government, salary ranges: \$30,750 to \$39,975, depending on qualifications and experience. A toxicologist provides leadership in assessing toxicological studies and evaluating reports of tests of potentially harmful chemicals in consumer products. Personnel qualifications (SF-171), or résumé should be sent to: **Ann S. Jordan, Division of Personnel, 5401 Westbard Avenue, Bethesda, Maryland 20207; telephone: 301-492-6500.**

## ANNOUNCEMENT

The National Cancer Institute has compiled a projection data base for two-dimensional computerized reconstruction. Copies of this library are available free of charge. For further information contact: **Judith M. S. Pre-witt, National Institutes of Health, Building 12A, Room 2053, Bethesda, Md. 20014. Telephone: 301-496-1247 or 1248.**

## TRAINEESHIPS

**POSTDOCTORAL TRAINEES** in endocrinology and metabolic regulation. M.D. or Ph.D. holders are invited to apply for postdoctoral traineeships available in the Department of Biochemistry, Temple University School of Medicine. Qualified applicants may select research areas related to several ongoing programs in enzymology, metabolic regulation, biochemistry of hormone receptors, and genetic aspects of endocrinology. Applicants should send résumé to: **Dr. Gerhard W. E. Plaut, Chairman, Department of Biochemistry, Temple University School of Medicine, Philadelphia, Pa. 19140.** Equal Opportunity Employer.

**POSTDOCTORAL TRAINEESHIP** in epidemiology and biostatistics related to ophthalmology and vision research at major medical center. Two-year joint program with Harvard School of Public Health, leading to a master of science degree in epidemiology. Supported by a NIH training grant. Send curriculum vitae to: **Dr. Bernard Schwartz, Chairman and Professor, Department of Ophthalmology, Tufts New England Medical Center, 171 Harrison Avenue, Boston, Mass. 02111.** An Equal Opportunity Employer, M/F.

A **POSTDOCTORAL** (Ph.D. or M.D.) **TRAINEESHIP** for research on congenital androgen insensitivity is available in the Cell Genetics Laboratory of the Lady Davis Institute for Medical Research in Montreal, M.D. (D.D.S. or D.V.M.) candidates must be within 4 years of graduation and must be Canadian citizens or landed immigrants in Canada. Ph.D. candidates must be within 2 years of graduation but are not restricted by citizenship or visa status. Send curriculum vitae and the names and addresses of at least two referees to: **L. Pinsky, M.D., 3755 Cote Sainte Catherine Road, Montreal, Quebec, Canada H3T 1E2.**

## POSITIONS OPEN

**MARINE BIOLOGICAL LABORATORY**  
Woods Hole, Massachusetts  
will conduct a residential laboratory course  
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This concentrated program, offered for the second time, is intended primarily for scientists and physicians who require theoretically based training and experience in modern light microscopy. Among the topics to be discussed and practiced will be bright- and dark-field, phase and modulation contrast, high-extinction polarized light and differential interference microscopy, fluorescence, and color and black-and-white photomicrography and cinemicrography. The instructor in chief will be Robert Day Allen of Dartmouth College.

Attendance is limited to 16 participants.

Application materials and additional information are available from: **Office of Admissions, Marine Biological Laboratory, Woods Hole, Mass. 02543. Telephone: 617-548-3705.** An Equal Opportunity/Affirmative Action Institution



## FELLOWSHIPS

**POSTDOCTORAL FELLOWSHIP** immediately available for recent graduate with experience in respiratory physiology; 2 years, starting fall 1978. Acid-base/hypoxia effects on respiratory gas exchange/oxygen transport. Send curriculum vitae, three references (directly by referees), and letter stating career goals to: **Dr. S. F. Sullivan, University of California, Los Angeles, School of Medicine, Los Angeles, Calif. 90024.** Equal Opportunity/Affirmative Action Employer.

**POSTDOCTORAL FELLOWSHIP** (NIH traineeship) available. Candidates may choose from among the following fields of research training related to the auditory and/or vestibular systems: transmission and scanning electron microscopy, histopathology, human auditory evoked potentials, and psychoacoustics. Send statement of interest and curriculum vitae to: **Dr. Robert A. Butler, Department of Surgery (Otolaryngology), Box 412, University of Chicago, Chicago, Ill. 60637.**

## FELLOWSHIPS

### POSTDOCTORAL FELLOWSHIPS FOR RESEARCH TRAINING IN HYPERTENSION

Fellowships are available for postdoctoral hypertension to individuals with the M.D. or Ph.D. degree starting January 1979. This multidisciplinary training program provides opportunities for research in pharmacological, physiological, and biochemical approaches to cardiovascular, renal, neural, and endocrine mechanisms in hypertension.

For further information contact:

**Dr. E. G. Schneider**  
**University of Tennessee Center for Health Sciences**  
874 Union Avenue  
Memphis, Tennessee 38163

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**POSTDOCTORAL FELLOWSHIP.** Autoradiographic localization of steroids in the central nervous system and other target tissues. Background in endocrinology and neuroanatomy preferred. Available 1 September 1978. Write:

**Dr. Peter Sheridan**  
**Department of Anatomy**  
**The University of Texas**  
**Health Science Center at San Antonio**  
703 Floyd Curl Drive  
San Antonio, Texas 78284  
Telephone: 512-696-6981

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### UNIVERSITY OF QUEENSLAND RESEARCH FELLOWSHIP IN COAL GEOLOGY

Applications are invited for a research fellow in coal geology to assist in establishing a new facility at the Department of Geology and Mineralogy. The fellow will be required to teach and to initiate a vigorous research programme and should be interested in coal petrology or in modeling studies on the formation and development of coal.

Queensland, now the largest producer of coal in Australia, has very substantial opencast coking coal mines and extensive proved reserves. The scope for research is virtually unique.

The appointment will be for 2 full years and carries a salary in the range A\$14,984 to A\$23,432. Applications with curriculum vitae and the names of three referees should be sent to: **Staff Officer, University of Queensland, St. Lucia, Brisbane, 4067, Queensland, Australia.** Closing date: 30 September 1978. Quote Reference No. 27878.

Note: applicants are themselves required to arrange that their referees submit reports directly to the staff officer by the closing date.

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## Post-Doctoral Appointment

Our Pharmaceutical Division has an attractive fellowship currently available in CNS Research. It will involve training and further development of methodology for evaluating the effect on laboratory animals of sleep-inducing compounds.

Applicants should have an educational background and up to 2 years of experience in neurophysiology or pharmacology. Some familiarity with EEG equipment will be desirable.

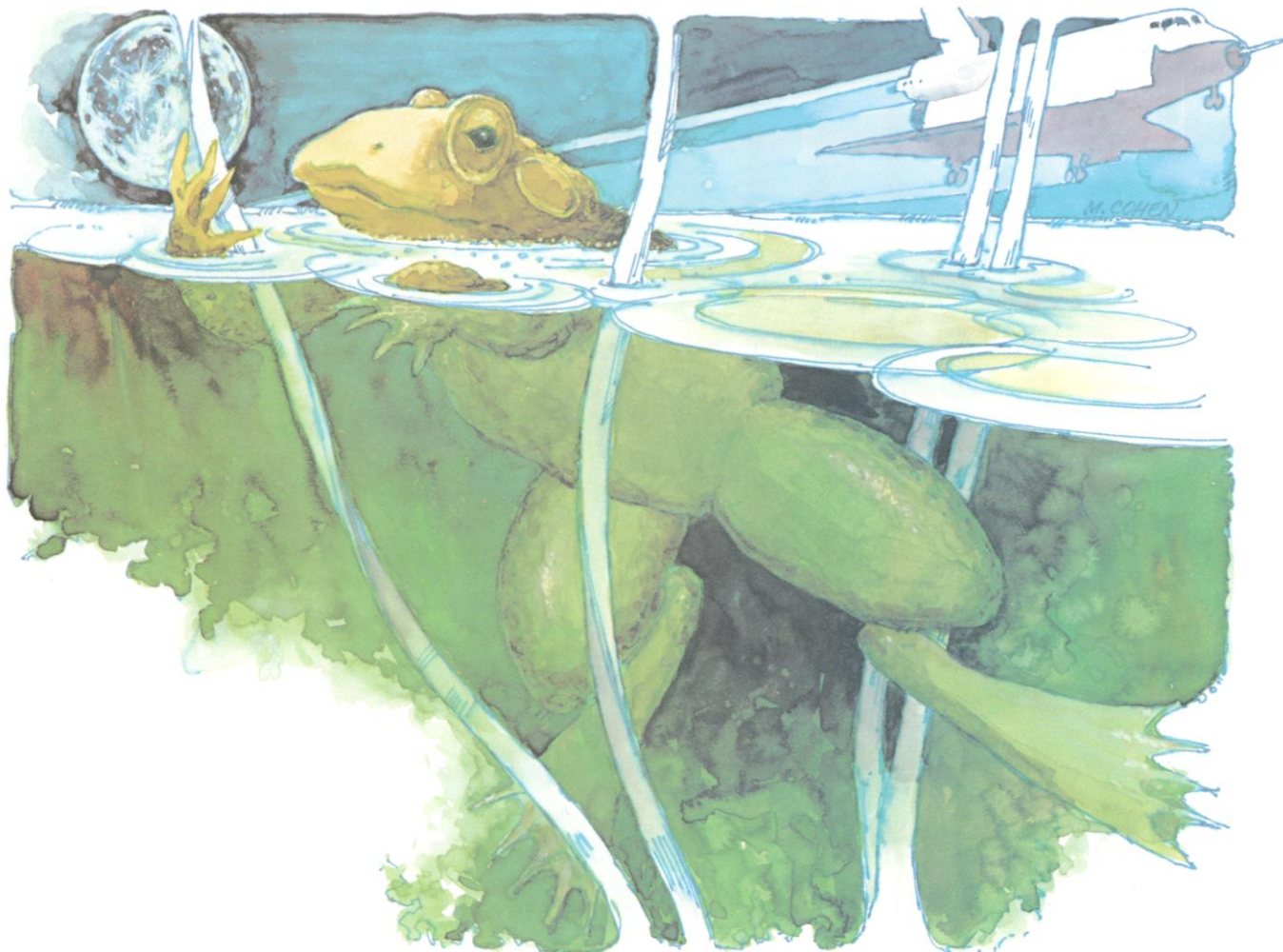
For further information and consideration, please direct your curriculum vitae to: **Manager, Personnel Operation, Schering-Plough Research Division, 60 Orange Street, Bloomfield, New Jersey 07003.**

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## VESTIBULAR FUNCTION RESEARCH

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Eons ago, amphibians took a far-reaching evolutionary step from the oceans to dry land.

Today, a company called TRW is helping a frog prepare for another exciting leap – from Earth to space.

At stake is a possible cure for space motion sickness, a syndrome which debilitates at least one-third of all astronauts and degrades crew performance and mission efficiency.

On a 1981 Spacelab flight, scientists from NASA's Ames Research Center will conduct the Vestibular Function Research experiment. Specially instrumented frogs will undergo centrifuge tests designed to reveal what makes them space sick.

Frogs were selected because their vestibular system resembles that of humans. The vestibular system, located in the inner ear, helps maintain balance and aids in adjusting to motion, acceleration and weightlessness.

The frogs' neural responses will also be monitored before and after the flight, making this the best documented leap by an amphibian since Mark Twain wrote about his celebrated jumping frog 115 years ago.

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This space science experiment is just one of more than 200 which TRW has built. We built the Viking Lander Biology Instrument which searched for life on Mars. We have just completed instruments for flights to Jupiter and Venus.

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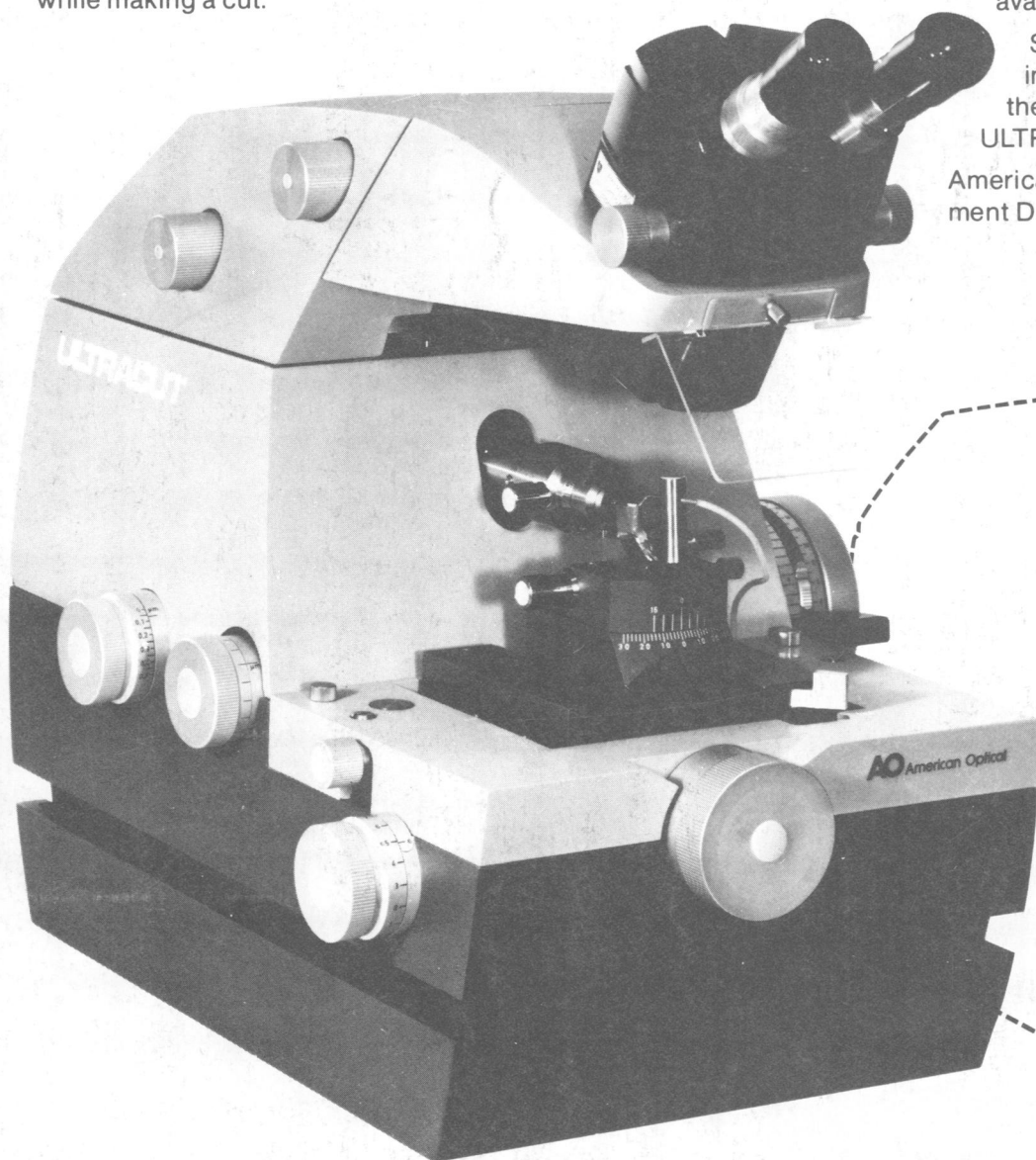
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