

ing the appearance of Tilman's system of theory which predicts from equilibrium assumptions the pattern (for instance) of maximum diversity at low-to-medium resource supply levels.

The structure of classical population genetics is grafted to traditional, animal-oriented population models; the definitions and variables assume that life histories return to zygotes at regular intervals. But the plant world is thick with species made up of clones, centuries or even millennia old, each living in several independent pieces, never reaching a stable distribution of ages or life-history stages, with recruitment of new recombinants at the lower margin of detectability, and perhaps with substantial somatic mutation rates. The treatments of selection in population genetics textbooks do not suggest sensible programs for investigating the evolutionary ecology of such plants. Plant demographers are beginning to shed the mental habits of animal ecology—an easy step, because population ecologists have never been able to agree what the questions are, never mind the answers—but have not yet got up the nerve to challenge population genetics. Tilman's book reflects plant demography as a whole in this. Throughout, he calls success "growth," a natural word to use of plant competition. But in asides he explains that growth can be strictly interpreted as "the long-term instantaneous per capita reproductive rate when a stable age or stage distribution has been reached." I should have been glad to see him dispense with this obeisance to a formal definition of fitness. Growth is a sensible measure of evolutionary success; the first imperative of success for a piece of genetic information is that tissue containing copies of it be made at least as fast as tissue containing it is lost. Whether a net profit of growth is accumulated within the individual or as multiplication of individuals all much the same size is a second-order question.

The book moves along purposefully; it is recognizably from the Princeton Monographs stable. The sequence of argument is outlined both before and after, and each chapter is clearly summarized; when sinking in a particular passage the reader knows in which direction to jump for solid ground. The method is graphical rather than algebraic. More ecologists will believe the argument as a result, because we can tell at a glance whether a conclusion changes when a line has a bend put in it. Tilman brings plants to stage front, where they belong. He strips away peripherals and concentrates on the basis of evolutionary success: use of energy and materials to build tissue con-

taining one's genes at a rate no slower, on average, than such tissue is lost. His model makes many predictions, plenty of them quite testable. His book deserves to be widely read.

MARK WESTOBY

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## Embryonic Development

**Cell Interactions and Development.** Molecular Mechanisms. KENNETH M. YAMADA, Ed. Wiley-Interscience, New York, 1982. xii, 288 pp., illus. \$39.95.

This collection of ten reviews by well-chosen authors summarizes and evaluates current knowledge of the molecular mechanisms underlying some of the cell interactions occurring during development. It was designed for advanced undergraduate and graduate students and for scientists who are not specialists in the subject. The intent of the editor and authors to create a thoroughly readable treatment of the subject is eminently achieved, for the papers provide current, understandable, and sometimes simplified accounts of research progress.

The first paper, by Wassarman, reviews sperm-egg interactions during fertilization, with special attention to the sea urchin and to studies by the author of the mouse zona pellucida. The paper is complemented by a treatment of the mating processes of yeast and of *Chlamydomonas* by Goodenough and Thorner. This paper contains a more detailed and comprehensive treatment of a narrower subject than any of the other papers does.

Roth gives a relatively brief but insightful account of the biochemistry of cell adhesion among vertebrate cells, and Barondes adds a discussion of developmentally regulated lectins and their possible roles in both intracellular and intercellular recognition. An interesting addition on a subject too often omitted in discussions of cell interactions is a paper by Dazzo on recognition involving plant cells. He reviews the mechanisms underlying selectivity in the fertilization process and those responsible for recognition and rejection of grafts. The emphasis of the paper, however, is on recognition between plants and microbes, including both pathogenic bacterial infections and the symbiosis between nitrogen-fixing *Rhizobium* and legumes.

Four papers deal with migrating cells and their interactions with the extracel-

lular matrix. Harris reviews cell migration and its directional guidance. He gives only a superficial account of the proteins responsible for movement but thoughtfully discusses chemotaxis and the molecular mechanisms underlying contact guidance. The composition and morphogenetic roles of the pericellular matrix are discussed by Toole and Underhill, and Yamada reviews the structure and functions of fibronectin. The information presented in these three papers is integrated into the life history of a single group of cells in Weston's account of the migration of the neural crest cells. Weston's paper also includes an enlightening discussion of the roles of environmental influences in determining the phenotypes expressed by crest cells and of the prospects for analysis of the "conversation" between crest cells and their surroundings. This theme is further explored by Kratochwil in an excellent review of embryonic induction.

The strength of this collection comes from its coherence and from the authors' success in promoting understanding. The authors are aided in this endeavor by a wealth of superior illustrations and a substantial index. The book could serve well as the basis for a seminar or as a supplemental textbook in developmental biology courses, since many of the widely used textbooks are deficient in precisely the subjects covered by the book. The sole drawback to its wide use in this role is the book's price, which, if added to the price of a classical textbook, would make for an expensive, though exciting, course.

R. B. MARCHASE

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## Books Received

**Geochemical Exploration in Deeply Weathered Terrain.** Papers from a workshop, Floreat Park, Western Australia, June 1982. Raymond E. Smith, Ed. CSIRO Division of Mineralogy, Wembley, W.A., Australia, 1982. vi, 190 pp., illus. Paper, \$A12.

**Handbook of Stress.** Theoretical and Clinical Aspects. Leo Goldberger and Shlomo Breznitz, Eds. Free Press (Macmillan), New York, and Collier Macmillan, London, 1982. xxii, 804 pp. \$49.95.

**Hankel and Toeplitz Matrices and Forms.** Algebraic Theory. I. S. Iohvidov. Translated from the Russian edition (1974) by G. Philip A. Thijssen. Birkhäuser, Boston, 1982. xiv, 232 pp. \$24.95.

**Health and the Law.** A Handbook for Health Professionals. Tom Christoffel. Free Press (Macmillan), New York, and Collier Macmillan, London, 1982. xiv, 450 pp. \$29.95.

**Heat Pipes.** P. Dunn and D. A. Reay. Pergamon, New York, ed. 3, 1982. x, 308 pp., illus. Paper, \$20.

**Heat Pipes and Thermosyphons for Heat Recovery.** Papers from a conference, London. D. A. Reay, Ed. Pergamon, New York, 1982. iv pp. + pp. 259-348, illus. Paper, \$64. *Journal of Heat Recovery Systems*, vol. 1, No. 4.

**Insect Behavior.** A Sourcebook of Laboratory and Field Exercises. Janice R. Matthews and Robert W. (Continued on page 538)

## BOOKS RECEIVED

(Continued from page 496)

Matthews, Eds. Westview, Boulder, Colo., 1983. xviii, 324 pp., illus. \$20.

**Insect Herbivory.** I. D. Hodkinson and M. K. Hughes. Chapman and Hall, London, 1982 (U.S. distributor, Methuen, New York). 78 pp., illus. Paper, \$6.50. Outline Studies in Ecology.

**Instrumental Insemination.** Papers from a conference, Kiel, Germany, Sept. 1980. E. S. E. Hafez and K. Semm, Eds. Nijhoff, The Hague, 1982 (U.S. distributor, Kluwer Boston, Hingham, Mass.). xii, 232 pp., illus. \$79. Clinics in Andrology 8.

**Intelligence Requirements for the 1980's.** Clandestine Collection. Roy Godson, Ed. National Strategy Information Center, New York, 1982 (distributor, Transaction Books, New Brunswick, N.J.). x, 232 pp., Paper, \$8.50.

**Interaction and Coevolution.** John N. Thompson. Wiley-Interscience, New York, 1982. x, 180 pp. \$27.50.

**Les Matériaux Utilisés en Environnement Spatial.** Spacecraft Materials in a Space Environment. Papers from a meeting, Toulouse, June 1982. European Space Agency, Paris, 1982 (distributor, ESTEC, Noordwijk, Netherlands). xiv, 324 pp., illus. Paper, 140 F. ESA SP-178.

**Ozonization Manual for Water and Wastewater Treatment.** W. J. Masschelein, Ed. Wiley-Interscience, New York, 1982. xxii, 324 pp., illus. \$41.95.

**Pesticides.** Theory and Application. George W. Ware, Freeman, San Francisco, 1982. xii, 308 pp., illus. Paper, \$19.95. Revision of *The Pesticide Book* (1978).

**Phobic and Obsessive-Compulsive Disorders.** Theory, Research, and Practice. Paul M. G. Emmelkamp. Plenum, New York, 1982. x, 358 pp., illus. \$27.50. The Plenum Behavior Therapy Series.

**Phospholipids in the Nervous System.** Vol. 1, Metabolism. Papers from a symposium. Lloyd A. Horrocks, G. Brian Ansell, and Giuseppe Porcellati, Eds. Raven, New York, 1982. xxii, 378 pp., illus. \$44.

**The Planet Venus.** Garry E. Hunt and Patrick Moore. Faber and Faber, London, 1982. 208 pp., illus. £10.

**Plant Cell and Tissue Culture.** A Laboratory Manual. J. Reinert and M. M. Yeoman. Illustrations by P. Macdonald. Springer-Verlag, New York, 1982. vi, 86 pp., \$18.

**Polymer Degradation.** Tibor Kelen. Van Nostrand Reinhold, New York, 1983. xii, 212 pp., illus. \$37.50.

**Population Biology of Infectious Diseases.** Papers from a workshop, Berlin, Mar. 1982. R. M. Anderson and R. M. May, Eds. Springer-Verlag, New York, 1982. viii, 316 pp., illus. \$18. Dahlem Workshop Reports. Life Sciences Research Report 25.

**The Population Dynamics of Infectious Diseases.** Theory and Applications. Roy M. Anderson, Ed. Chapman and Hall, London, 1982 (U.S. distributor, Methuen, New York). xii, 368 pp., illus. \$39.95. Population and Community Biology.

**Progress in Research and Clinical Applications of Corticosteroids.** Proceedings of a symposium, Tallahassee, Fla., Feb. 1981. Henry J. Lee and Thomas J. Fitzgerald, Eds. Heyden, Philadelphia, 1982 (distributor, Wiley, New York). x, 302 pp., illus. \$52.95.

**The Protozoan Nucleus.** Morphology and Evolution. Igor B. Raikov. Translated from the Russian edition (Leningrad, 1978) by Nicholas Bobrov and Marina Verkhovtseva. Springer-Verlag, New York, 1982. xvi, 476 pp., illus. \$86.40. Cell Biology Monographs, vol. 9.

**The Psychoanalytic Study of the Child.** Vol. 37. Albert J. Solnit, Ruth S. Eissler, Anna Freud, and Peter B. Neubauer, Eds. Yale University Press, New Haven, Conn., 1982. viii, 588 pp. \$37.50.

**Regional Conflict and National Policy.** Papers from a meeting, Washington, D.C., Oct. 1981. Kent A. Price, Ed. Resources for the Future, Washington, D.C., 1982 (distributor, Johns Hopkins University Press, Baltimore). xviii, 142 pp. Cloth, \$18; paper, \$6.95.

**The Role of the University Teaching Hospital.** An International Perspective. Papers from a conference, Durham, N.C., Apr. 1981. Elizabeth F. Purcell, Ed. Josiah Macy, Jr. Foundation, New York, 1982 (distributor, Independent Publishers Group, Port Washington, N.Y.). viii, 258 pp., illus. Paper, \$10.

**Strategies of Plant Reproduction.** Papers from a symposium, Beltsville, Md., May 1981. Werner J. Meudt, Ed. Allanheld, Osmun, Totowa, N.J., and Granada, London, 1982. xiv, 386 pp., illus. \$38. Beltsville Symposia in Agricultural Research, 6.

**Van Nostrand's Scientific Encyclopedia.** Douglas M. Considine and Glenn D. Considine, Eds. Van Nostrand Reinhold, New York, ed. 6, 1982. xvi, 3068 pp., illus. \$99.50; in two volumes, \$129.50.

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**Microbial Geneticist.** Ph.D. 1981. Two years of postdoctoral experience in recombinant DNA and hybridoma technology. Seeking industrial or academic position. Scott A. Minnich, Department of Biological Sciences, Purdue University, West Lafayette, Ind. 47906. Telephone: 317-494-4990. X

**Microbiologist.** Ph.D., 3 years of postdoctoral experience, environmental microbiology, nitrogen fixation metabolism. GC, EM experience, some recombinant DNA work. Seeking academic, industrial, or consulting position. Willing to work in other fields for which qualified. Box 106, SCIENCE. X

**Molecular Biologist/Microcomputer Programmer.** Ph.D. 1971; postdoctoral and university faculty research experience with recombinant DNA, sequence analysis, microcomputer languages (Pascal, C, dBASE); seeking position in biotechnology, software development, or similar field. Box 108, SCIENCE. X

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**Ph.D.** seeks fuel alcohol research or production related position. Fermentation specialty, broad experience, publications. Reply: Box 104, SCIENCE. X

**Plant Geneticist.** Ph.D. 1981. Research, production experience in universities and industries; knowledge of tissue culture, plant breeding, mutagenesis, cytology, and a wide range of microscopical techniques. Good communication skills. Publications. Versatile and hard working. Academic, industry, government, and research institution. Also, postdoctorals. Salary negotiable. Box 102, SCIENCE. X

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**AGRICULTURAL DRAINAGE ENGINEER.** Assistant professor, tenure-track position in the Departments of Land, Air and Water Resources and Agricultural Engineering; 35 percent teaching and 65 percent research. Ph.D. in soil physics, agricultural engineering, or related field with one degree in engineering with a strong background in flow and solute-water interactions in porous media, mathematical and computer simulation modeling skills, and competence in design and evaluation of agricultural drainage systems.

Teaching responsibilities include advising, instructing undergraduate-level course descriptive of soil water flow, solute transport, and agricultural drainage systems, and another in drainage system design. At the graduate level, a course in groundwater flow is required. Research in the detailed processes occurring in shallow groundwater is expected to provide management alternatives and drainage design criteria for cropped areas and for drain water reuse.

Applicants should submit curriculum vitae, transcripts, statement of research and teaching interests and background in each, copies of publications and manuscripts, and the names and addresses of at least three references to: **Professor D. R. Nielsen, Chair, Search Committee, Department of Land, Air and Water Resources, 121 Vehn Meyer Hall, University of California, Davis, California 95616**, by 15 July 1983.

*The University of California is an Equal Opportunity/Affirmative Action Employer and invites applications from all qualified individuals.*

**ANATOMIST or PHYSIOLOGIST.** Full-time temporary position (renewable for up to a total of 5 years) at the assistant professor level to teach courses in anatomy and physiology, neurology, and histology. Ph.D. required. Send résumé, copies of transcripts, and letters of recommendation by 16 May 1983 to: **Dr. B. Gottfried, Department of Biology, College of St. Catherine, St. Paul, Minn. 55105.** *An Equal Opportunity/Affirmative Action Employer.*

## ASSISTANT/ASSOCIATE FIELD PROGRAM SUPERVISOR

Field program supervisor to arrange, develop, maintain, supervise, and evaluate field work placements for graduate students in behavioral sciences and health education. The successful applicant will be able to bridge the gap between the theoretical and the applied in health education and behavioral sciences, and will be a member of the academic community as a scholarly, innovative practitioner. Qualifications are an M.P.H. or equivalent degree and demonstrated experience in one or both fields. Salary range is \$22,900 to \$38,500, depending on qualifications. Initial and subsequent reappointments are at 66⅔ percent hard money and 33⅓ percent dependent on available funding. To apply, submit curriculum vitae along with a statement indicating how you match the position qualifications to: **Chairman, Department of Social and Administrative Health Sciences, 508 Earl Warren Hall, School of Public Health, University of California, Berkeley, California 94720.** Closing date for applications is 15 July 1983. *The University of California is an Equal Opportunity/Affirmative Action Employer.*

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The incumbent must have a knowledge of food microbiology, biochemistry, and microbial genetics.

**Salary:** GS-11 (\$24,508 per annum) or GS-12 (\$29,374 per annum).

U.S. citizenship is required and most federal government benefits apply. For application requirements contact:

**Personnel Office**  
U.S. Department of Agriculture  
Eastern Regional Research Center  
600 E. Mermaid Lane  
Philadelphia, PA 19118  
TEL: 215-233-6573

Completed applications must be received by June 3, 1983.

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## NOTICE

### REQUEST FOR NOMINATIONS OF INDIVIDUALS FROM SMALL BUSINESS ORGANIZATIONS TO SERVE AS MEMBERS OF NIH SCIENTIFIC REVIEW GROUPS FOR THE SMALL BUSINESS INNOVATION RESEARCH (SBIR) PROGRAM

The National Institutes of Health (NIH) invites nominations of individuals representing small business organizations for membership on its scientific peer review groups. These groups provide the technical and scientific merit review of Small Business Innovation Research grant applications. Scientists serving on these groups advise the NIH on the selection of the most meritorious projects to implement biomedical research programs of the highest quality. Although a number of scientists from commercial organizations now serve on these advisory bodies, NIH has a special interest in adding greater representation from the small business scientific sector than now exists.

All nominations will be carefully considered; NIH reserves the right to make final selections.

#### Responsibilities

Each review group is composed of primarily non-Federal scientists selected for their competence in the particular scientific area for which that group has review responsibilities. Such responsibilities generally involve several days of intensive review of research proposals prior to a meeting of the review group. Specific applications are assigned in advance of the meeting to each member who prepares written detailed critiques prior to the meeting and leads discussion at the meeting.

#### Criteria for Membership

The primary requirement for serving on a scientific review group is demonstrated competence as an independent investigator in a research and development specialty in a laboratory or clinical setting. Assessment of such competence is based on the quality of research accomplished, proven ability to develop a product or process with commercial applications, and/or other significant scientific activities, accomplishments, and honors. Usually a doctoral degree or its equivalent is required. Service also requires mature judgment, balanced perspective, objectivity, ability to work effectively in a group context, commitment to complete work assignments, and assurance that the confidentiality of applications will be protected.

#### How to Respond to Request

Any person may nominate one or more highly qualified candidates for consideration. Self-nominations are acceptable. Nominations should be made promptly for immediate consideration, and at any time thereafter for future attention. Each nomination should be clearly identified as representing the small business sector.

#### For each nomination:

- Provide full name of nominee, title, complete mailing address (including organizational affiliation), and telephone number.
- In not more than two or three lines, provide in *key words* information concerning the nominee's scientific areas of experience, interest, and expertise.
- Name, address, telephone number, and signature of nominator.
- An updated and comprehensive curriculum vitae of the nominee.

The nominator may be contacted for more detailed information. Nominees should be informed prior to being nominated. They will be sent a packet requesting relevant information upon receipt of nomination.

#### Send information to:

**NIH Consultant File Project**  
Suite 212  
6400 Goldsboro Road  
Bethesda, Maryland 20817

National Institutes of Health  
National Institute of Arthritis, Diabetes, and  
Digestive and Kidney Diseases  
Division of Intramural Research

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**To: Mr. Clifford Moss, Executive Secretary**  
Cystic Fibrosis Search Committee, NIADDK  
National Institutes of Health  
9000 Rockville Pike, Building 31, Room 9A34  
Bethesda, Maryland 20205  
Phone: (301) 496-4231

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## POSITIONS OPEN

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Applications are invited for a position in the Department of Anatomy, available 1 July 1983. Applicant should have Ph.D. in anatomy. Teaching responsibilities are in gross anatomy and assistance in neuroanatomy laboratory. Expertise in TEM/SEM with ability to supervise EM suite required. One to 2 years of postdoctoral experience preferred. Applicant should send résumé, statement of current research interests, and three letters of recommendation to: **Dr. R. C. Holland, Chairman, Department of Anatomy, Morehouse School of Medicine, 720 Westview Drive, SW, Atlanta, Ga. 30310. An Equal Opportunity/Affirmative Action Employer.**

**ASSISTANT NEUROLOGIST:** Diagnosis, consultation, and patient care of persons suffering with primary and secondary cancer of the brain and the effects of other cancers on the central nervous system. Conduct interferon research. M.D. degree required with 3 years of residency training in neurology and 2 years of experience in neuro-oncology. Texas license required and must have research background; 60 hours per week; \$56,800 annual salary. Apply at the Texas Employment Commission, Houston, Texas, or send résumé to: **Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O. Number 2740256. An Equal Opportunity Employer.**

**ASSISTANT PROFESSOR** position available with the following prerequisites: training in anatomy and neurophysiology. More than 5 years of post-Ph.D. experience in light and electromicroscopy of the CNS, membrane neurophysiology (intracellular recordings), electronics (design and construction of instrumentation in electrophysiology), computer programming and design, and computer-assisted neuronal modeling. Five years of teaching experience in anatomy and physiology. Candidates must be fluent in at least one foreign language. Please send curriculum vitae by June 1983 to: **Chairman, Department of Anatomy, University of Tennessee Center for the Health Sciences, 875 Monroe Avenue, Memphis, Tenn. 38163. Salary range: \$32,000 to \$35,000.**

**ASSISTANT PROFESSOR OF ANATOMY**—Dartmouth Medical School. Must have Ph.D. and/or M.D., postdoctoral experience, and substantial current funding. Current research and experience should complement on-going studies of epithelial function using biophysical techniques. Must be willing to assist in the teaching of one of the anatomical disciplines. Send curriculum vitae, a brief outline of research experience, and names of three references to: **Dr. John W. Mills, Department of Anatomy, Dartmouth Medical School, Hanover, N.H. 03756. Deadline for receipt of applications is 22 May 1983. An Affirmative Action/Equal Opportunity Employer.**

**BIOCHEMICAL PHARMACOLOGIST**—Position available for research associate/assistant research scientist with Ph.D. in pharmacology, biochemistry, or molecular biology to investigate the role of free radical formation in antineoplastic drug action; analytical (HPLC, ESR, GC-MS) and cell culture experience required; knowledge of membrane biochemistry and recombinant DNA technology helpful. Send curriculum vitae to: **Dr. J. Doroshow, Department of Medical Oncology, City of Hope Medical Center, 1500 East Duarte Road, Duarte, Calif. 91010.**

**BIOLOGY:** Faculty position, assistant professor level. Primary interest and commitment to quality undergraduate instruction. Teaching duties (12 hours) include introductory biology for science majors, science for nonscience majors, and upper division courses in modern ecology, genetics, and related areas. Ph.D. required. Teaching experience preferred. Begin fall 1983. Application deadline: 15 May 1983. Send curriculum vitae, supporting documents, and three letters of recommendation to: **Dr. Denton B. May, Academic Dean, King's College, Wilkes-Barre, Pa. 18711. An Affirmative Action/Equal Opportunity Employer.**

**RESEARCH ASSOCIATE.** Postdoctoral position available in summer 1983 to study the cell biology of ion and water secretion in exocrine glands. Research involves electrophysiological techniques, analysis of receptor binding, and identification of cell types involved in adrenergic mediated stimulation of transport. Send curriculum vitae and three letters of reference to: **Dr. John W. Mills, Department of Anatomy, Dartmouth Medical School, Hanover, N.H. 03756. An Affirmative Action/Equal Opportunity Employer.**

## POSITIONS WANTED

### SOUTH CAROLINA STATE COLLEGE ORANGEBURG, S.C. 29117 POSITIONS AVAILABLE

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**ASSISTANT PROFESSOR OF BIOLOGY**—Qualifications include a doctorate with training in anatomy and physiology and 3 years of teaching experience. Some experience in using microcomputers in instruction preferred. Research strongly encouraged. Duties include teaching undergraduate courses in comparative vertebrate anatomy, cell physiology, introductory biophysics, and human physiology; and advising undergraduate students. Salary is commensurate with qualifications. Send curriculum vitae, letter of application, three letters of recommendation, and unofficial transcripts to: **Dr. J. H. Arrington, Chairman, Department of Natural Sciences, South Carolina State College, Orangeburg, S.C. 29117.**

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**ASSISTANT PROFESSOR OF PATHOLOGY.** The Oregon Health Sciences University, Department of Pathology, is seeking an assistant professor to participate in teaching, research, and the diagnostic services of surgical pathology and cytology. Training and experience in hematopathology are required. Send curriculum vitae and bibliography to:

**Dr. Richard D. Moore, Chairman  
Department of Pathology (L113)  
Oregon Health Sciences University  
Portland, Oregon 97201**

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

The **DEPARTMENT OF PHYSIOLOGY**, College of Medicine, University of Saskatchewan, has two tenurable positions at the **ASSISTANT PROFESSOR** level, available 1 July 1983 (subject to budgetary confirmation). The applicants must have a Ph.D., D.D.S., D.V.M., or M.D. degree with postdoctoral experience. The ability to establish an independent research program is required. For one position, preference will be given to individuals with teaching and research expertise in neurophysiology. Applicants with expertise in renal, gastrointestinal, or respiratory physiology are invited to apply for the second position. Address enquiries to: **N. M. McDuffie, Acting Head, Department of Physiology, College of Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada S7N 0W0. In accordance with Canadian immigration requirements, this advertisement is directed to Canadian citizens and permanent residents.**

### The University of Texas at Dallas FACULTY POSITIONS IN ENVIRONMENTAL SCIENCES

**SOLAR ENERGY SPECIALIST**—The University of Texas at Dallas (UTD) seeks to fill two tenure-track faculty positions in the Graduate Program in Environmental Sciences. Preference will be given to applicants who have an established record of research experience in and promise of future contributions to some area of energy and natural resource systems, particularly one of the following fields: renewable energy systems, especially those which involve innovative concepts in energy storage, cooling, or chemical synthesis; energy systems modeling; or energy risk analysis. Applicants must also show capability for the interest in interdisciplinary interaction with other components of the Environmental Sciences Program at UTD, should hold the Ph.D. degree in some area of the physical sciences or engineering, and have a strong interest in teaching and directing student research at the graduate level. Interested parties, including particularly minorities and women, should submit: (i) current curriculum vitae (indication of sex and ethnicity for Affirmative Action statistical purposes is requested but not required), (ii) a statement of current and future research interests, and (iii) four letters of recommendation, by 30 June 1983 to:

**Academic Search Number 255  
The University of Texas at Dallas  
P.O. Box 688  
Richardson, Texas 75080**

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

## POSITIONS OPEN

### CHIEF, ADULT BONE TUMOR SERVICE PRESBYTERIAN—UNIVERSITY OF PENNSYLVANIA MEDICAL CENTER

The Department of Orthopaedic Surgery at the University of Pennsylvania School of Medicine is seeking applicants for a full-time academic position as chief of the Adult Bone Tumor Service at the Presbyterian—University of Pennsylvania Medical Center, a major teaching and research facility of the University of Pennsylvania. Candidates should have completed a year's fellowship in bone tumor surgery. Duties of the position include participation in the teaching and research programs of the department as well as the clinical responsibilities of running an adult bone tumor service. Applicants should submit their curriculum vitae and arrange to have three letters of recommendation sent directly to:

**Carl T. Brighton, M.D., Ph.D.  
Professor and Chairman  
Department of Orthopaedic Surgery  
University of Pennsylvania School of Medicine  
Two Silverstein  
3400 Spruce Street  
Philadelphia, Pa. 19104**

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

### CHIEF, ORTHOPAEDIC SURGERY SERVICE PRESBYTERIAN—UNIVERSITY OF PENNSYLVANIA MEDICAL CENTER

The Department of Orthopaedic Surgery at the University of Pennsylvania School of Medicine is seeking applicants for a full-time academic position as chief of the Orthopaedic Surgery Service at the Presbyterian—University of Pennsylvania Medical Center, a major teaching and research facility of the University of Pennsylvania. Duties of the position include participation in the teaching and research programs of the department as well as the clinical responsibilities of running a general orthopaedics service in a 328-bed hospital. Applicants should submit their curriculum vitae and arrange to have three letters of recommendation sent directly to:

**Carl T. Brighton, M.D., Ph.D.  
Professor and Chairman  
Department of Orthopaedic Surgery  
University of Pennsylvania School of Medicine  
Two Silverstein  
3400 Spruce Street  
Philadelphia, Pa. 19104**

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

### LECTURER VETERINARY GROSS ANATOMY SCHOOL OF VETERINARY MEDICINE UNIVERSITY OF WISCONSIN—MADISON

The responsibilities of this position include primarily teaching first-year professional students small and large animal gross anatomy, some teaching in developmental and neuroanatomy, and some administrative responsibilities. Applicants should have either the D.V.M. degree and practice experience or the Ph.D. degree and 2 years of anatomy teaching experience. This is a 9-month academic year position, but a 1 July 1983 start date is desirable for the first year. Applicants should send a complete résumé and the names and addresses of three references. Closing data for applicants is 15 May 1983 or until filled. Send applications to: **Dr. Norman J. Wilsman, School of Veterinary Medicine, 2015 Linden Drive West, University of Wisconsin—Madison, Madison, Wis. 53706.**

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

### PHARMACOLOGIST/BIOCHEMIST

The Auckland Division of the Cancer Society of New Zealand Inc. invites applications for a Warner Lambert Company-sponsored Cancer Research Fellowship in the Cancer Research Laboratory. The fellowship will be for an initial period of 2 years with salary on the university lecturer scale up to N.Z.\$25,684. Applicants should have a Ph.D. or equivalent, plus experience in drug metabolism. The appointee will be required to undertake pharmacokinetic and metabolic studies in analogues of the antileukaemia drug amosacrine. Send, by 30 June 1983, curriculum vitae, publication list, and names of three referees who can be contacted to: **Dr. B. C. Baguley, Director, Cancer Research Laboratory, University of Auckland Medical School, Private Bag, Auckland, New Zealand.**

## POSITIONS OPEN

The University of Texas Medical School at Houston is seeking a **CHAIRMAN** for its Department of Obstetrics and Gynecology. Candidates must have distinguished records of scholarly accomplishment and a commitment to academic medicine.

Persons interested in being considered for the position should submit curriculum vitae and bibliography to: **Griff T. Ross, M.D., Ph.D., Chairman, Search Committee, The University of Texas Medical School at Houston, G-004 MSMB, 6431 Fannin Street, Houston, Texas 77030**, prior to 1 June 1983.

*The University of Texas Health Science Center at Houston is an Equal Opportunity Employer. Women and minorities are encouraged to apply.*

**CHEMIST, ORGANIC (RESEARCH ASSOCIATE ORGANIC CHEMISTRY).** Require Ph.D., minimum experience of 3 years with small-scale techniques for work with acid, air, and moisture sensitive compounds, strong background in organic sulfur chemistry. Research: synthesis of dienes, trienes, polyenes, and their applications to the synthesis of industrially useful and/or naturally occurring polyunsaturated compounds; use UV, IR, NMR, GC, HPLC, mass spectrometry, photochemical reactors; \$12,000 per year. Contact: **Albany Job Service Office, attention: Gene Bevins, 488 Broadway, Albany, N.Y. 12207**; refer to Job Order Number 4808495, D.O.T. code 022.061-010.

## POSITIONS OPEN

**CHAIR, DEPARTMENT OF ANATOMY.** The Medical University of South Carolina is seeking a highly qualified academic to assume the position of professor and chair of the Department of Anatomy. Candidates must have the Ph.D. and/or M.D., administrative and leadership capability, commitment to teaching and an ongoing research program within the broad reach of anatomical science. A substantial opportunity exists in the productive and cooperative setting developed at this institution which is dedicated to biomedical education and research. Nominations and applications should be sent to: **Dr. Edward L. Hogan, Chairman, Search Committee for Anatomy, Department of Neurology, Medical University of South Carolina, 171 Ashley Avenue, Charleston, S.C. 29425.** An Equal Opportunity/Affirmative Action Employer. Qualified women and minority candidates are encouraged to apply.

### ENVIRONMENTAL PHYSIOLOGIST

Openings for postdoctoral training and for research associate are available for individuals interested in exercise, cardiopulmonary, or environmental physiology. Please send curriculum vitae and the names of three individuals who could serve as references. Please send correspondence to: **Director, Division of Environmental Physiology, The Johns Hopkins University, School of Hygiene and Public Health, 615 North Wolfe Street, Baltimore, Maryland 21205.**

## POSITIONS OPEN

### FACULTY OPENING IN DEPARTMENT OF OBSTETRICS AND GYNECOLOGY

for  
Assistant Professor  
in

Division of Women's Health

Rank and salary: negotiable, commensurate with training and experience.

Qualifications: M.D. with university residency training; certified or eligible for certification by American Board of Obstetrics and Gynecology. Demonstrated interest and experience in undergraduate and graduate medical education, clinical and/or basic research, clinical practice of obstetrics and gynecology, family planning, and emergency room medicine. Special consideration will be given to persons with specific interests or experience in the preventive aspects of reproductive health.

For further information, contact:

**J. George Moore, M.D.  
Professor and Chairman  
Obstetrics and Gynecology  
University of California, Los Angeles (UCLA)  
School of Medicine  
Los Angeles, Calif. 90024**

*UCLA is an Affirmative Action/Equal Opportunity Employer.*

## RESEARCH GROUP LEADER Fermentation Technology

Anheuser-Busch Companies, the world's largest brewer and major producer of baking yeast, baked goods and yeast extracts is heading in the right direction and we want to take you along! A career with Anheuser-Busch opens up a once-in-a-lifetime opportunity, and brings with it the chance to work with some of the best minds in the business world today.

In this newly created position, designed to meet the expanding role of our Research and Development Department, your duties will include the initiation, planning and direction of key research projects focusing on the control of yeast metabolism and growth, through nutrition and the fermentation environment.

The ideal candidate will possess a Ph.D in Fermentation Technology or Yeast Physiology and 5-10 years' pertinent experience including the ability to investigate:

- yeast nutrition and growth, both aerobically and anaerobically
- fermentation technology & biochemical engineering
  - molecular yeast biology
- control of enzyme expression in r-DNA yeast
  - continuous cultivation

We are seeking an innovative, independent thinker with excellent communications skills and previous supervisory experience. Knowledge of computer programming, data retrieval and project management is a definite plus.

In addition to a stimulating professional environment and a highly competitive compensation package, your future will be limited only by your own ability and drive. Forward your resume in complete confidence to: **ANHEUSER-BUSCH COMPANIES; Corporate Employment; Department A-61-S-S; One Busch Place; St. Louis, Missouri 63118.** An Equal Opportunity Employer M/F.



## ANHEUSER-BUSCH COMPANIES

**You're Heading in the Right Direction With Anheuser-Busch!**



## POSITIONS OPEN

The Department of Land, Air and Water Resources, **UNIVERSITY OF CALIFORNIA, DAVIS**, announces a position in the area of **BIOMETEOROLOGY**. Tenure-track (11 months) position will be divided 50 percent teaching and 50 percent research. The appointment will be at the assistant or associate professor level, depending on qualifications.

**QUALIFICATIONS:** A Ph.D. in atmospheric science or a closely related discipline, with a specialization in the interactions between the atmosphere and the biosphere. Applicants should have teaching and research interests in biometeorology and be able to demonstrate an ability to describe physical/biological systems with experimental and theoretical techniques. The appointee will be expected to direct research activities in biometeorology toward problems important to California agriculture. Teaching may include both undergraduate and graduate courses in biometeorology, undergraduate courses in general areas of atmospheric science, and advising responsibilities.

**APPLICANTS:** Applicants should submit curriculum vitae, transcripts, statement of research and teaching interests and background in each, copies of publications and manuscripts, and the names and addresses of at least three references to: **R. H. Shaw, Chair, Search Committee, Department of Land, Air and Water Resources, 177 Hoagland Hall, University of California, Davis, Calif. 95616**, no later than 15 June 1983.

*The University of California is an Equal Opportunity/Affirmative Action Employer and invites applications from all qualified individuals.*

The Department of Physiology and Biophysics is seeking candidates for **TWO NEW FACULTY POSITIONS**. Applicants must have a doctoral degree and several years of postdoctoral experience, and should be prepared to carry out independent research and to participate in the teaching activities of the department. We will consider applicants in any area of physiology or biophysics, but will give preference to people who are studying molecular and cellular bases of organ-system function. Applicants must be able to teach mammalian physiology to graduate students and health professional students. We plan to appoint tenure-track assistant professors but will also consider applicants for appointment as tenured associate and full professors. Applicants should send their curriculum vitae and bibliography, reprints of several recent papers, a statement of current research interests, and the names of three references to:

**Dr. Robert Perlman**  
Head, Department of Physiology and Biophysics  
University of Illinois College of Medicine  
P.O. Box 6998  
Chicago, Ill. 60680

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

## SLAVO/ITALY POSITIONS IN MOLECULAR BIOLOGY

Slavo, an ENI subsidiary, is a company specialized in the production of biological products for medical application.

Headquarters, plants, and applied research facilities are located in Siena in a very pleasant situation, and laboratories are modern and well equipped. A separate center for basic research has now been established. This center includes divisions of molecular biology, biochemistry, cell biology, and immunology. Since the Molecular Biology Department is now expanding, positions are available at the senior and junior level. Applicants are expected to have a productive research record in the fields of nucleic acids, genetic engineering, cell transformation, or virology. Salaries will be commensurate with experience and seniority of the applicants, in accordance with international standards. Send résumé and names of referees to:

**Slavo Research Center**  
ISVT Slavo S.p.A.  
Via Fiorentina 1  
53100 Siena, Italy

**POSTDOCTORAL POSITION**—Two-year appointment available immediately for recent Ph.D. to work on research project characterizing circulating DNA in patients with autoimmune disease. Candidate should have strong background in recombinant DNA techniques with interest in clinically oriented questions and/or basic immunology. Send résumé and three references to: **Dr. Charles Steinman, Director, Division of Rheumatology, State University of New York-Downtown Medical Center, 450 Clarkson Avenue, Box 42, Brooklyn, New York 11203**.

## POSITIONS OPEN

### FACULTY POSITIONS

The School of Optometry of the University of California, Berkeley, invites applications for two teaching and research positions, one at the associate professor level with tenure, and one at the assistant professor level (a tenure-track position). These positions will be filled as soon as practical. Requires O.D. and/or Ph.D., or equivalent degrees. The successful applicants will teach clinical courses on pediatric and/or binocular vision and establish an independent research program. Preference will be given to persons in visual psychophysics with special qualifications in one or more of the following: clinical optometry, visual assessment in infants and children, and clinical disorders of monocular and binocular vision. Clinical qualifications are an advantage.

Curriculum vitae, statement of research and teaching interests (and background in each), graduate and undergraduate transcripts, lists and reprints of published works, and names and addresses of at least three references should be sent to:

**Professor Clifton M. Schor**  
Chairman, Search Committee  
School of Optometry  
University of California  
Berkeley, California 94720

Applications will be accepted until 30 May 1983 or until the position is filled.

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

**HUMAN ANATOMY AND PHYSIOLOGY.** One-year appointment with possibility of continuation; assistant professor or instructor. Will teach sections of human anatomy and physiology and possibly general biology or other course(s) appropriate to background. Ph.D. required in area appropriate to human anatomy and physiology; previous teaching experience preferred. Submit curriculum vitae and three letters of reference by 8 June 1983 to: **Dr. Stephen W. Fuller, Department of Biological Sciences, Mary Washington College, Fredericksburg, Va. 22401**. *Equal Opportunity Employer.*

**JUNIOR INVESTIGATOR**, Center for Blood Research, to serve concurrently as assistant professor, Harvard Medical School. Applications are invited from individuals with a Ph.D. or equivalent degree and postdoctoral experience in the area of murine immunogenetics. Preference will be given to candidates with a strong publication history of original research contributions in this area and ability to interface with ongoing programs in human immunogenetics. Although salary is negotiable, candidate must be able to obtain extramural funding for his/her own research program. Send curriculum vitae to: **Dr. C. A. Alper, Center for Blood Research, 800 Huntington Avenue, Boston, Mass. 02115**. Include three representative reprints or preprints and the names, addresses, and telephone numbers of three references.

*An Equal Opportunity/Affirmative Action Employer*

## MOLECULAR BIOLOGIST/DEVELOPMENTAL BIOLOGIST

The University of Ottawa, Department of Biology, has a tenure-track position available at the assistant professor level; the appointment will be made during the 1983-1984 academic year. Applications are invited from individuals with a Ph.D. and relevant postdoctoral experience, with research interests in the general area of molecular or developmental biology. The successful candidate will be expected to maintain an active, externally funded, research program and to contribute to undergraduate and graduate teaching. The appointee will become a member of the Ottawa-Carleton Centre for Graduate Studies and Research in Biology, a cooperative program between the University of Ottawa and Carleton University, which includes active collaboration with scientists from several government laboratories. The University of Ottawa is a bilingual institution; the ability (or willingness to learn) to lecture in both English and French is essential.

Applicants should submit, by 30 June 1983, curriculum vitae and a brief description of teaching interests and future research plans, and should arrange to have three letters of recommendation sent to: **Dr. D. A. Hickey, Chairman, Search Committee, Department of Biology, University of Ottawa, Ottawa, Ontario, Canada K1N 6N5**.

*In accordance with Canadian immigration requirements, priority will be given to Canadian citizens and permanent residents of Canada.*

## POSITIONS OPEN

### HEAD, DIVISION OF MICROBIOLOGY Department of Epidemiology and Public Health Yale University School of Medicine

Applications and nominations are sought in the Department of Epidemiology and Public Health for the position of head of microbiology which includes virology, immunology, medical entomology, parasitology, bacteriology, and tropical medicine. Divisional teaching responsibilities include a Ph.D. program in microbiology, microbiology for medical students, and an M.P.H. program in tropical health.

The appointee's responsibilities will also include research, the initiation of appointments and promotions, the development and presentation of the divisional budget, plus coordination of research and teaching programs with other units of the Medical School and University.

Requirements are an outstanding research record plus teaching recognition to justify appointment as a tenured full professor. Interest in and familiarity with molecular biology and immunology are an asset. The position is available during the 1983-1984 academic year. *Yale University is an Affirmative Action/Equal Opportunity Employer.*

Letters of nomination or application should be mailed by 1 June 1983 to: **Professor Francis L. Black, Search Committee Chairman, Department of Epidemiology and Public Health, 60 College Street, New Haven, Connecticut 06510**.

## UNIVERSITY OF WESTERN AUSTRALIA Perth LECTURER IN PHYSIOLOGY

Applications are invited from medical and science graduates for appointment to the above position in the Department of Physiology. Applicants should have experience in teaching and research in any area of human or mammalian physiology.

Duties will include teaching physiology at undergraduate levels to medicine, science, and dentistry students, engaging in research and supervising graduate student research projects. The appointment may be taken up from 1 January 1984. Further information can be obtained from the head of the department, **Professor E. H. Morgan**.

Current salary: A\$22,430 to A\$29,467 per annum. Benefits include superannuation, fares to Perth for the appointee and dependant family, and a removal allowance.

The appointment may be offered for a period of 3 years in the first instance with some prospects of continuation, or may be offered with tenure. Conditions of appointment will be specified in any offer of appointment which may be made as a result of this advertisement.

Applications, in duplicate, stating full personal particulars, qualifications, and experience, should reach: **The Staffing Officer, University of Western Australia, Nedlands, Western Australia, 6009, Australia** by 4 June 1983. Candidates should request three referees to write immediately to the Staffing Officer.

**POSTDOCTORAL POSITION** available in area of isolation and characterization of membrane proteins. Stipend: \$15,000 to \$18,000 per year, depending on qualifications. Experience in the field essential. Send curriculum vitae and three letters of reference to: **Dr. O. P. Bahl, Department of Biological Sciences, 347 Cooke Hall, State University of New York at Buffalo, Amherst, N.Y. 14260**. *An Equal Opportunity/Affirmative Action Employer.*

**POSTDOCTORAL POSITION** available immediately to study the effects of corticosteroids on collagen in acutely damaged lung tissue. Ph.D. in pharmacology, biochemistry, or toxicology. HPLC experience useful but not mandatory. Send curriculum vitae and names and telephone numbers of two references to: **Dr. James Kehrer, Division of Pharmacology/Toxicology, College of Pharmacy, The University of Texas, Austin, Texas 78712**. *An Equal Opportunity/Affirmative Action Employer.*

**POSTDOCTORAL/RESEARCH ASSOCIATE** position available immediately to study the interaction of chronic ethanol exposure and aging in the rat hippocampus. The research involves the use of extracellular field potential recordings to study both synaptic distribution and plasticity. Send curriculum vitae and three letters of reference to: **Dr. Bruce E. Hunter, Department of Neuroscience, College of Medicine, JHMHC, Box J-244, University of Florida, Gainesville, Florida 32610**. *An Equal Opportunity/Affirmative Action Employer.*

**KING FAISAL UNIVERSITY  
COLLEGE OF MEDICINE  
DAMMAM, SAUDI ARABIA  
1983-1984 Academic Year**



King Faisal University, College of Medicine, invites applications from qualified men and women for the 1983-1984 academic year in the following disciplines:

**CHEMISTRY  
BIOLOGY  
PHYSICS**

**ANATOMY  
BIOCHEMISTRY  
EPIDEMIOLOGY  
PATHOLOGY**

**MICROBIOLOGY  
PHYSIOLOGY  
IMMUNOLOGY**

Doctorate and minimum of 2 years teaching experience (medical school) required. Language of instruction is English. Interviews will be held in London and Houston.

Salaries are highly competitive and negotiable. Benefits include free furnished housing, educational allowances, air tickets to and from Saudi Arabia once each year for family of four, 60-day paid vacation, and liberal overweight baggage allowance. No Saudi income tax.

Send curriculum vitae with day and evening telephone numbers and the names and addresses of three references to:

**Dr. Tawfik Tamimi  
Dean, College of Medicine  
c/o U.S. Recruiting Office  
2425 West Loop South, Suite 540  
Houston, Texas 77027**

or

**c/o U.K. Recruiting Office  
29 Belgrave Square  
London, S.W.1X, 8QB, England**

**Help Lead and Expand  
Ongoing Life Science  
Data Bank and  
Related Activities**

Bolt Beranek and Newman Inc. (BBN), a well established advanced-technology R&D firm in Cambridge, Mass., is looking for a Senior Scientist/Manager with an excellent grasp of and experience using computers in support of Molecular Biology research. Interest in sequence analysis would be particularly helpful.

Project leadership and entrepreneurial abilities are very important. This is a unique career opportunity with excellent long-term potential.

BBN is a leader in the design and operation of National biomedical research systems and is principal contractor for several major NIH projects including PROPHET — The Chemical/Biological Information Handling System, GenBank™ — The Genetic Sequence Data Bank, and for the Council on Environmental Quality CSIN — The Chemical Substances Information Network. We are also successfully marketing software products for scientific research such as the widely used RS/1 package.

Write — Please do not call —

**Dr. Howard Bilofsky  
Computer Systems Division  
BOLT BERANEK AND NEWMAN INC.  
10 Moulton Street  
Cambridge, MA 02238  
an equal opportunity employer m/f**



***Research Management Position  
in Materials Science (Composites)***

The Office of Naval Research is seeking a highly qualified materials scientist to serve as a Scientific Officer to plan and manage a contract research program. The research sponsored is conducted principally at universities and industrial laboratories. This is a Civil Service position at the **GM-13 (\$34,930-\$45,406)** or **GM-14 (\$41,277-\$53,661)** level, depending on qualifications.

The incumbent is responsible for planning, coordinating and directing a program in basic research

on composite materials. Areas of special interest include metal, ceramic, and organic matrix composites with emphasis on processing, non-destructive evaluation, and failure mechanisms.

Applicants must have a Ph.D degree or equivalent and a minimum of three years of progressively responsible professional experience. At least one year of experience must be comparable in difficulty and responsibility to the next lower

level in the Federal service.

Equivalent combinations of professional experience and graduate education may be acceptable. It is desirable that applicants have demonstrated research experience in at least two of the materials classes listed above.

Interested persons should submit a resume or Standard Form 171, Personal Qualifications Statement (available at Federal Job Information Centers or from the address below), to:

**OFFICE OF NAVAL RESEARCH**

**Civilian Personnel Division, Code 791SC • ATTN: Announcement #83-14 [S]  
800 North Quincy Street, Arlington, VA 22217**

Applications will be accepted through 17 June 1983 and must be received by that date.

An Equal Opportunity Employer

U.S. Citizenship Required

## POSITIONS OPEN

**POSTDOCTORAL POSITION** is available immediately to study the molecular aspects of NAD metabolism in *Salmonella typhimurium*. Background in genetics, recombinant DNA technology, bacterial physiology, or biochemistry preferred. Salary: \$16,900 per annum. Send résumé and three references to: **Dr. John W. Foster, Department of Microbiology, Marshall University School of Medicine, Huntington, W.Va. 25704.**

### POSTDOCTORAL POSITION

Opening in the research laboratories of the Division of Hematology and Oncology, Children's Hospital, Department of Pediatrics, and the Program on Cell and Developmental Biology, Harvard Medical School, for a Ph.D. to study the biochemistry and cellular biology of red blood cell differentiation. Current areas of research include the structural and functional analysis of hormone-receptor interaction, identification of cell lineage, specific antigens, development of monoclonal antibodies and radioimmunoassays, protein purification and related techniques, and analysis of globin gene expression.

Send résumé and names and addresses of three references to: **Dr. Arthur J. Sytkowski, Hematology Research, Children's Hospital Medical Center, 300 Longwood Avenue, Boston, Mass. 02115. An Affirmative Action/Equal Opportunity Employer.**

**RHIZOBIOLIST** to collect *Rhizobium* strains from different soil types and assess their symbiotic and  $N_2$ -fixing properties; identify strains using marking techniques as antibiotic resistance, fluorescent antibody, and auxotrophic markers; select more competitive strains by fingerprinting indigenous soil populations using intrinsic resistance to antibiotics and by use of plasmid profiles; test inoculum strains which may be more competitive and efficient in fixing nitrogen. Minimum requirements: Ph.D. in microbiology, 18 months of experience as rhizobiologist plus experience in plasmid DNA technology and *Rhizobium* genetics; field trial experience and knowledge in electrophoretic analysis. Forty hours per week; salary: \$28,000 per year. Contact: **B. Janecek, Wisconsin Job Service, 206 North Broom Street, Madison, Wis. 53703; telephone: 608-266-3037.** This ad not paid for by Job Service funds.

### NATIONAL SCIENCE FOUNDATION (NSF)

NSF, Office of Scientific and Engineering Education, is seeking candidates for the position of **ASSOCIATE PROGRAM DIRECTOR IN THE FELLOWSHIPS SECTION**. This is a rotational assignment for 1 to 2 years. The position is excepted from the competitive civil service with a salary range of \$34,930 to \$53,661 per annum (equivalent to GS-13/14). Appointment will begin during summer 1983. Candidates should have a Ph.D. in science or engineering or equivalent research experience at the college or university level. In addition, for the GG-13 (GS-13 equivalent) level, 4 years of teaching and research experience at the college or university level beyond the Ph.D. is required and for the GG-14 (GS-14 equivalent) level, 6 years of teaching and research experience at the college or university level beyond the Ph.D. is required. Preference will be given to candidates with a background in physics. Some administrative experience and familiarity with the training in science of teachers for the secondary school level are also desirable. The position will center mainly on administering the NATO Postdoctoral Fellowships in Science program and related activities. The incumbent will also contribute to the range of staff expertise available to advise on other activities of the office, including teacher-training programs. Responsibilities include all aspects of application handling, panel review, evaluation, award and program administration, liaison with outside agencies, and representation of the Foundation in the scientific community. The closing date for applications is 20 May 1983. Applicants should submit résumés, indicating their current salary, to: **The National Science Foundation, Personnel Administration Branch, Room 212, 1800 G Street, NW, Washington, D.C. 20550, attention: E. Paul Broglie.** For further information, telephone: 202-357-7841. NSF is an Equal Opportunity Employer.

## POSITIONS OPEN

**POSTDOCTORAL RESEARCH ASSOCIATE.** We have a position available immediately for a recent Ph.D. in chemistry or biochemistry to do bioorganic mechanistic studies on the cytochrome P-450 enzymes. Techniques that will be applied include enzymology, computers, organic synthesis, kinetics, stable isotopes, GC, HPLC, GC-MS, NMR, IR, UV-VIS. Send curriculum vitae to: **Dr. Ronald E. White, Department of Pharmacology, University of Connecticut Health Center, Farmington, Connecticut 06032. Telephone: 203-674-3466. An Affirmative Action/Equal Opportunity Employer, M/W/H.**

### KING SAUD UNIVERSITY COLLEGE OF MEDICINE RIYADH, SAUDI ARABIA PROFESSOR OF PHYSIOLOGY

**PROFESSOR OF PHYSIOLOGY**, King Saud University College of Medicine, Riyadh, Saudi Arabia, with a concurrent appointment in the Department of Physiology, University of Colorado School of Medicine. Successful candidates will be expected to teach undergraduate medical students and assist in development of research programs in physiology at King Saud University. Two positions are available with renewable annual contracts. Substantial remuneration and benefits.

Please send application with updated curriculum vitae and passport-sized photograph to: **Dr. A. Robert Martin, Professor and Chairman, Department of Physiology, University of Colorado School of Medicine, 4200 East Ninth Avenue, Box C-240, Denver, Colorado 80262. Equal Opportunity/Affirmative Action Employer.**

### KING SAUD UNIVERSITY/KING KHALID UNIVERSITY HOSPITAL, SAUDI ARABIA PROFESSORS OF ANATOMY

Two professors of anatomy, one specializing in gross anatomy and one in neuroanatomy, are required to take leading role in teaching and research planning at new University Hospital for tour of 1 to 2 years. Salary and benefits extremely competitive in minimum taxation situation. Recently updated and attractive housing arrangements and generous leave allowance. Position available now.

Applicants will be interviewed at the University of Colorado School of Medicine and successful candidates will be granted temporary clinical faculty rank as professor at the University of Colorado.

Please send application with updated curriculum vitae to: **Dr. John F. Nolte, Associate Professor and Acting Chairman, Department of Anatomy, University of Colorado School of Medicine, 4200 East Ninth Avenue, Box B-111, Denver, Colorado 80262. Equal Opportunity/Affirmative Action Employer.**

### RESEARCH ASSOCIATE

**GENEX CORPORATION**, a genetic engineering company located in Gaithersburg, Maryland, is seeking person with B.S. degree in biology, chemistry, microbiology, or biochemistry with 4 to 5 years of experience, or M.S. degree with 2 years of experience, to participate in vector development for expression of eukaryotic genes in microorganisms. Position requires expertise in state of the art of recombinant DNA techniques. Some work will also be required in modifying the microbial host to optimize expression of heterologous genes and maximize stability of the desired product.

GENEX offers a stimulating research environment and competitive fringe benefits. Qualified applicants should submit résumé and three professional references to:

**GENEX CORPORATION  
Department J.  
6110 Executive Boulevard  
Rockville, Md. 20852**

*Principals Only—Equal Opportunity Employer*

**RESEARCH ASSOCIATE/POSTDOCTORAL POSITION** with multidisciplinary group studying the behavioral toxicology of food substances with particular emphasis on immunologic mechanisms. Candidates should have degree work in one of the following areas: assessment of human cognitive and behavioral performance, human psychopharmacology, or neuro- or behavioral toxicology. Opportunity for pursuing own research interest if compatible with the program. Salary at appropriate NIH level. Send curriculum vitae, statement of career goals, and three letters of reference to: **John W. Crayton, M.D., Department of Psychiatry, University of Chicago, 950 East 59 Street, Chicago, Ill. 60615. An Equal Opportunity/Affirmative Action Employer.**

## POSITIONS OPEN

**POSTDOCTORAL OPENING** for a person with interests in drug-DNA research. Employing antitumor drugs and natural DNA's, the study will utilize DNA footprinting techniques to uncover the interrelationships between drug, DNA structure, and binding sequence specificity. Ph.D. required with experience in either nucleic acid biophysics, gene-cloning techniques, and/or DNA sequencing. Salary: \$15,000. Send résumé and three letters of recommendation to either: **Dr. James C. Dabrowiak, Department of Chemistry or Dr. John N. Vournakis, Department of Biology, Syracuse University, Syracuse, New York 13210, by 1 June 1983. Equal Opportunity/Affirmative Action Employer.**

### POSTDOCTORAL POSITION IN BIOPHYSICS

The Department of Physics at Arizona State University seeks an experimentalist to work on an inelastic light-scattering study of the lattice vibrations of DNA. A background in biophysical chemistry is essential, and some knowledge of spectroscopy is desirable. The position is funded for 3 years, starting 1 June 1983. Applicants must send a résumé and arrange to have three letters of recommendation sent to: **S. M. Lindsay, Physics Department, Arizona State University, Tempe, Ariz. 85287.** The closing date for receipt of all materials is 12 May 1983. Arizona State University is an Affirmative Action/Equal Opportunity Employer.

### DISTINGUISHED PROFESSOR

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The department's strength is in interdisciplinary studies. It presently has 18 faculty and approximately 70 graduate students. Its designation as a Program of Emphasis, extraordinary state and community support over the past 4 years, and initiation of a doctoral program have led to a large jump in national ranking.

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**Chairman, Search Committee  
Department of Marine Science  
University of South Florida  
140-7th Avenue South  
St. Petersburg, Fla. 33701**

*The University of South Florida is an Affirmative Action/Equal Opportunity Institution. Closing date for applications is 1 July 1983.*

**RESEARCH ASSOCIATE**—Postdoctoral position to study associate and symbiotic nitrogen fixation, effective 15 August. Requires Ph.D. in plant or microbial science with a strong background in biochemistry; \$16,800, annual. Apply with letter/résumé by 1 June to: **Dr. Robert Klucas, Department of Agricultural Biochemistry, University of Nebraska-Lincoln, Lincoln, Nebraska 68583-0718. Affirmative Action/Equal Opportunity Employer.**

**RESEARCH ASSOCIATE**—An opportunity for an analytically oriented Ph.D. chemist or biochemist to join a highly productive research program characterizing the DNA modifications produced by selected antitumor agents. Training in nucleic acid chemistry, enzymology, and monoclonal antibody production would be helpful. Applicants should submit curriculum vitae together with the names of professional references to: **David B. Ludlum, Ph.D., M.D., Department of Medicine, Albany Medical College, Albany, New York 12208. An Equal Opportunity/Affirmative Action Employer**

**RESEARCH LEADER/RESEARCH CHEMIST** (GM-13, -14, or -15) position with Agricultural Research Service (ARS) at the Southern Regional Research Center, New Orleans, Louisiana, to conduct research and provide leadership to a group of chemists and food technologists in expanding the basic understanding of vegetable proteins. Research involves preparation, isolation, fractionation, and concentration of proteins through varied techniques as well as studying the changes that occur during heating, pH adjustments, fermentation processes, and enzymatic modifications. A strong background in analytical, physical, organic chemistry, biochemistry, and food technology and published research in protein chemistry required. Salary (\$34,930 to \$48,553) based upon qualifications and experience. A federal career Civil Service position. For application procedures, contact: **Jane L. Giles, USDA-ARS-SRAO-C-4, Box 53326, New Orleans, La. 71053. Telephone: 504-589-4316. Equal Opportunity Employer.** Candidates must be U.S. citizens.



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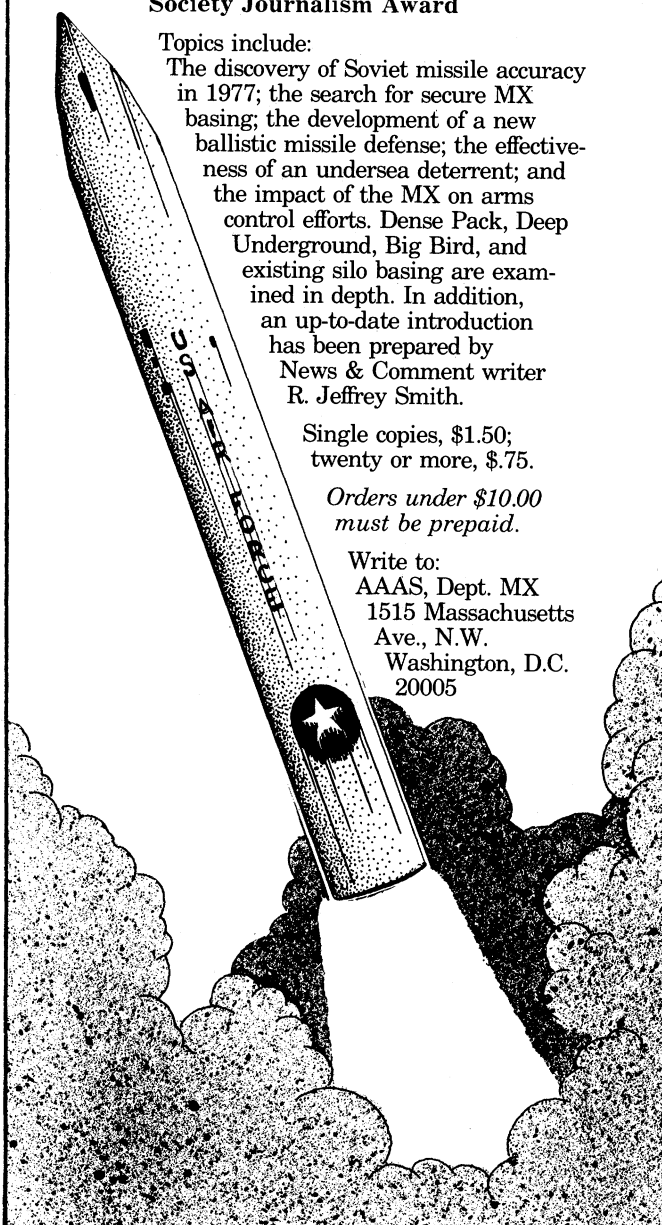
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Applicants should send their curriculum vitae and the names of three referees to:

**Dr. Joseph J. Harrington, Ph.D.**  
Chairman of the Search Committee/Biostatistics  
Office of the Dean  
Attention: J. Macdonald  
677 Huntington Avenue  
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**RESEARCH LEADER/SUPERVISORY MICROBIOLOGIST** (GM-13, -14, or -15) position with Agricultural Research Service (ARS) at the Southern Regional Research Center in New Orleans, Louisiana, to conduct research and provide leadership to a group of microbiologists and chemists studying mycotoxins in agricultural commodities. Research involves determination of fungal flora; development of assays; identification, isolation, purification, and structure determinations of toxicants; and determination of biosynthetic pathways. Strong background in mycology, biochemistry, plant physiology, toxicology, and analytical chemistry and published research on mycotoxins required. Salary (\$35,930 to \$48,553) is based upon qualifications and experience. A federal Career Civil Service position. For application procedures, contact: **Jane L. Giles, USDA-ARS-SRAO-M2, P.O. Box 53326, New Orleans, La. 70153. Telephone: 504-589-4316.** *Equal Opportunity Employer.* Candidates must be U.S. citizens.

## FELLOWSHIPS

**PREDOCTORAL AND POSTDOCTORAL RESEARCH OPPORTUNITIES IN PHARMACOLOGY AT SOUTHERN ILLINOIS UNIVERSITY SCHOOL OF MEDICINE.** Highly qualified applicants who are interested in graduate studies in pharmacology are invited to apply for fellowships or research assistantships. The curriculum includes a core course which emphasizes a thorough knowledge of the basic principles of pharmacology and a laboratory course which stresses the use of sophisticated biomedical equipment and techniques. Specialization beyond the core curriculum is obtained in the research areas of faculty expertise. Postdoctoral research is also possible in one of these research areas. The major research interests in the department are neuropharmacology, autonomic/cardiovascular pharmacology, endocrine pharmacology and metabolic regulation; drug metabolism, and toxicology. For more information, contact: **Dr. Ezio Giacobini, Professor and Chairman, Department of Pharmacology, Southern Illinois University School of Medicine, P.O. Box 3926, Springfield, Ill. 62708.** *An Equal Opportunity/Affirmative Action Employer.*

## FELLOWSHIPS

The University of Pennsylvania, Philadelphia, will offer National Cancer Institute-sponsored **RESEARCH TRAINING FELLOWSHIPS IN NUTRITION AND CANCER**, starting July 1983. The program emphasizes a core didactic experience modified to suit the previous training of each fellow, accompanied by a broad exposure to research methodology in both clinical and laboratory situations. Two years of specialty training beyond the M.D. or Ph.D. degree are required. Applicants must be citizens or have been lawfully admitted to the United States for permanent residence. Applications are accepted at any time during the calendar year. For a 1 July appointment, applications must be received by 15 May. Appointments are made for 1 year and may be renewed for one additional year. Appointments will run from 1 July to 30 June of the subsequent year. For information, write: **James L. Mullen, M.D., Program Director, Hospital of the University of Pennsylvania, 3400 Spruce Street, Philadelphia, Pa. 19104.**

## POSTDOCTORAL FELLOWSHIP IN BIOCHEMICAL PARASITOLOGY

Postdoctoral fellowship available to study purine and nucleic acid in pathogenic protozoans, especially leishmania and trypanosomes. Investigation includes metabolic pathways, enzymology, and use of tissue culture to study intracellular forms. Applicant should have experience in biochemistry, tissue culture, and analytical techniques used in biochemistry laboratory. Please send curriculum vitae to: **J. J. Marr, M.D., University of Colorado Health Sciences Center, Division of Infectious Diseases, Box B-168, 4200 East 9 Avenue, Denver, Colo. 80262.** *The University of Colorado is an Equal Opportunity Employer.*

## NEW ZEALAND SENIOR AND POSTDOCTORAL RESEARCH FELLOWSHIPS

The National Research Advisory Council offers 12 fellowships to be taken up in 1984 for research in government departments in fields of importance to New Zealand.

**Senior Research Fellowships.** Applicants should have a distinguished record of scientific research and/or administration in a relevant field.

**Postdoctoral Research Fellowships.** Applicants should be recently graduated research workers in a relevant field with a Ph.D. or equivalent degree and some experience since graduation.

Applicants must have a good working knowledge of English and meet New Zealand immigration requirements. Emoluments, which are taxable, range from N.Z.\$25,684 to N.Z.\$46,682. Return travel to New Zealand is provided. Application forms and information booklets may be obtained from: **National Research Advisory Council, P.O. Box 12240, Wellington, New Zealand**, or New Zealand diplomatic posts. Applications close on 1 August 1983.

## INQUIRY

### SCIENTIFIC FRAUD

Major news organization looking into instances of scientific fraud occurring in recent past or currently. Participants and observers write:

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**POSTDOCTORAL TRAINEESHIP** available September 1983 in cancer-related medical radiation physics for Ph.D.'s in physics. Program consists of courses and active participation in research. The stipend is provided by National Research Service Award under the auspices of an Oncology Research Training Grant. U.S. citizens or permanent residents are eligible. Facilities available include x-ray and electron sources, nuclear medicine and radiobiology instrumentation, computer systems, hyperthermia, CT and NMR imaging systems. Send curriculum vitae, transcripts, and three references to: **Dr. Lawrence H. Lanzl, Program Director, Section of Medical Physics, Rush University, 1753 West Congress Parkway, Chicago, Ill. 60612.** *An Equal Opportunity Employer.*

## REQUEST FOR PROPOSALS

The EPA/NCSU Acid Precipitation Program, a cooperative research program between the U.S. Environmental Protection Agency (EPA) and North Carolina State University (NCSU), is now **requesting proposals** for research on the effects of acid deposition on aquatic ecosystems—specifically, projects related to pH-aluminum stress on fish populations in the Adirondacks, New York; status of fish, plankton, and benthic populations in acidic lakes in northern New England and the Adirondacks; and development of a biological sampling protocol for long-term monitoring programs. For submission details, send a self-addressed envelope to: **EPA/NCSU Acid Precipitation Program, 1509 Varsity Drive, Raleigh, N.C. 27606.** Deadline for requesting information is 13 May 1983.

## PROGRAMS

### M.S. IN APPLIED MOLECULAR BIOLOGY

The University of Maryland Baltimore County (UMBC) is offering a master's degree program in applied molecular biology beginning in September 1983. This program is designed to train highly qualified professionals for biotechnology industries. The degree can be obtained via a 5-year, B.A.-M.S. track, or a 2-year M.S. track. There is a heavy emphasis on intensive (25 to 50 hours per week) laboratory courses, at least one per semester over the 2-year program. Laboratory courses include biochemistry, recombinant DNA techniques (isolation, cloning, characterization of eukaryotic genes), molecular genetics, tissue culture and hybridoma production of monoclonal antibodies, specific-sequence DNA synthesis, electron microscopy of nucleic acids, internal research internships, and an external summer research internship in a local biotechnology company. Requests for information should be sent to: **The Graduate School, L020, UMBC, 5401 Wilkens Avenue, Baltimore, Md. 21228.**

## COURSES

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To request admissions application and information on financial aid, write: **Dr. Robert R. Given, Director, Catalina Marine Science Center, P.O. Box 398, Avalon, Calif. 90704; telephone: 213-743-6792.**

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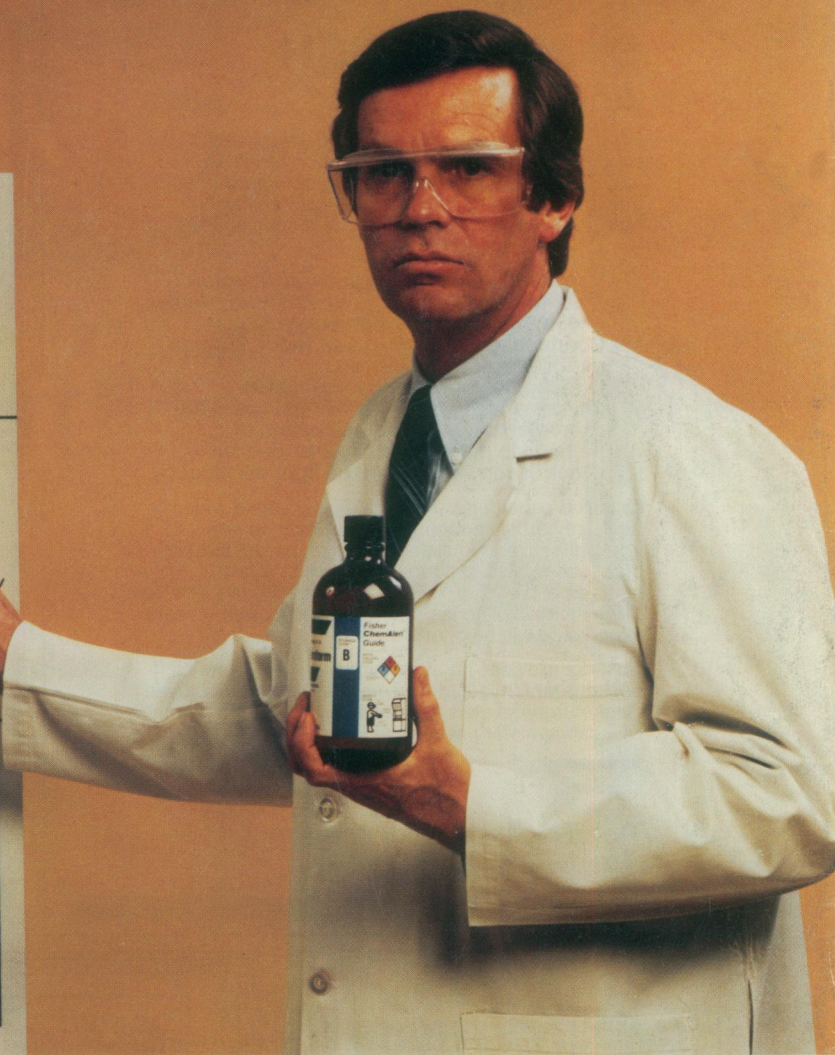
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