

is not possible to infer all the important physical, chemical, and biological processes in this zone from studies of the bulk soil or of plants in nutrient solution. The physical and chemical properties and biological population of the root-soil interface can change rapidly over short times and short distances, and almost all methods of study are of necessity indirect and remote. Nevertheless, the studies reported in the book are more than sufficient to make a convincing argument for the importance of this interfacial region. The uncertainty principle appears to be applicable to such studies in that almost any technique for studying the properties and processes in this microsystem introduces first-order perturbations that often overshadow the effect being studied. Scanning electron microscopy, fluorescence microscopy, soil psychrometry, and electron paramagnetic resonance as well as radioisotopic and chemical measurements have provided a fascinating quantity of experimental observations. The use of a fiber-optic duodenoscope offers what appears to be the least disturbing method of direct visual observation.

In reading the book one is struck by the need to quantify many qualitative observations that have obvious significance. Good progress has been made in the quantification of water flow, ion transport by mass flow, and diffusion. In other cases, however, quantification is more difficult. For example, though the contribution of mycorrhiza activity to phosphorus availability is demonstrable, it is far from clear how to build it into the quantitative theories. It is difficult enough to try to quantify the contribution of microflora to nutrient availability through decomposition of plant residues. When one must also take into account the grazing on these microflora by protozoans such as amoebae the task becomes formidable, yet soils containing amoebae along with bacteria may exhibit 100 percent more mineralization of $\text{NH}_4^+\text{-N}$ than those with bacteria alone.

The question whether there is an air gap or other form of poor mechanical contact between root and soil still seems unanswered. Time-lapse photographs of roots visible in a rhizotron have been previously taken as evidence of appreciable diurnal shrinkage and swelling of roots, suggesting a substantially reduced contact during the day, when transpiration is at a maximum. In the book there is also evidence of a substantial drop in soil-water potential between the bulk soil and the root xylem. Whether this evidence reflects poor root-soil contact, overestimates of the number of ab-

sorbing roots, or some yet unidentified factor is not clear.

Symptomatic of the uncertainty concerning the nature of the root-soil interface are the many roles attributed to mucigel in various contributions to this volume. Mucigel is an elixir concocted of plant mucilages, bacterial cells, and their metabolic products (polysaccharides, peptides, lipids, and so on) that serves as sort of rhizobial Maxwell's demon. Mucigel binds cations and is thus presumed to retard penetration by heavy metal cations in the vicinity of the apical meristem. It provides a measure of selectivity for other ions such as potassium, and it serves as a source of protons at the root surface, acidifying the adjoining region sufficiently to enhance the dissolution of inorganic compounds. It may reduce the friction between the growing root tip and the soil. Its constituent molecules contribute to the glue with which soil aggregates are stabilized. Most of all, mucigel is purported to enhance the contact between soil and root. If it is a true gel, as is often averred, it can clearly provide a hydrated pathway for ion transport by diffusion. It is more difficult to see how a gel can contribute significantly to water transport, since the hydraulic conductivity of a gel is relatively low. Even in the sol form the large molecules may increase the viscosity of the soil solution and could, theoretically, lead to a nonlinear flow equation. If one accepts the estimates sometimes made that as much as 18 percent of the carbon fixed by photosynthesis ends up as organic matter released into soils by cereal plant roots, the yield of mucilage and other compounds approaches that of the grain. While most crop models take root growth into account, few deal with this metabolic sink explicitly.

Many of the names that one would hope and expect to see are to be found in the list of authors, and the volume provides a wealth of authoritative information about root-soil interactions. It also provides its share of conventional wisdom for which the actual evidence is never produced. It is obvious that the contribution of the book to communication between representatives of diverse scientific disciplines is only a beginning. Many of the most difficult problems will be solved not by interdisciplinary teams but by individuals who are equally at home with the jargon, the concepts, and the experimental techniques of chemistry, physics, and biology.

W. R. GARDNER

*Department of Soil Science,
University of Wisconsin,
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Books Received

Advances in Child Development and Behavior. Vol. 13. Hayne W. Reese and Lewis P. Lipsitt, Eds. Academic Press, New York, 1979. xiv, 314 pp., illus. \$24.

Annual Review of Biochemistry. Vol. 48. Esmond E. Snell, Paul D. Boyer, Alton Meister, and Charles C. Richardson, Eds. Annual Reviews, Palo Alto, Calif., 1979. xii, 1168 pp., illus. \$18.

The Burnside Problem and Identities in Groups. S. I. Adian. Translated from the Russian edition (Moscow, 1975) by John Lennox and James Wiegold. Springer-Verlag, New York, 1979. xii, 314 pp. \$39. *Ergebnisse der Mathematik und ihrer Grenzgebiete* 95.

Catecholamines. Basic and Clinical Frontiers. Proceedings of a symposium, Pacific Grove, Calif., Sept. 1978. Earl Usdin, Irwin J. Kopin, and Jack Barchas, Eds. Pergamon, New York, 1979. Two volumes. lxxvi, 1954 pp., illus. \$200.

Categorical Topology. Proceedings of a conference, Berlin, Aug. 1978. H. Herrlich and G. Preuss, Eds. Springer-Verlag, New York, 1979. xii, 420 pp., illus. Paper, \$19.50. *Lecture Notes in Mathematics*, vol. 719.

The Denotational Description of Programming Languages. An Introduction. Michael J. C. Gordon. Springer-Verlag, New York, 1979. vi, 162 pp. Paper, \$9.

Electrical Load-curve Coverage. Proceedings of a symposium, Rome, Oct. 1977. Published for the United Nations by Pergamon, New York, 1979. xx, 546 pp., illus. \$70.

The Frontiers of Sex Research. Vern L. Bullough, Ed. Prometheus Books, Buffalo, N.Y., 1979. vi, 190 pp. Cloth, \$16.95; paper, \$6.95.

Genetic Disorders among the Jewish People. Richard M. Goodman. Johns Hopkins University Press, Baltimore, 1979. xviii, 494 pp., illus. \$32.50.

Hypertensive Disorders in Pregnancy. Papers from a symposium, Münster. Fritz K. Beller and Ian MacGillivray, Eds. Thieme, Stuttgart, and PSG Publishing Company, Littleton, Mass., 1978. x, 98 pp., illus. \$18.50.

I and That. Notes on the Biology of Religion. Alex Comfort. Crown, New York, 1979. 160 pp. \$6.95.

Mysteries of the Mummies. The Story of the Unwrapping of a 2000-Year-Old Mummy by a Team of Experts. Rosalie David, Ed. Scribner, New York, 1979. 192 pp., illus. \$14.95.

Narcissism. Psychoanalytic Essays. Béla Grünberger. Translated from the French edition (Paris, 1971) by Joyce S. Diamanti. International Universities Press, New York, 1979. xx, 312 pp. \$22.50.

Psychology of Adjustment. Personal Growth in a Changing World. Eastwood Atwater. Prentice-Hall, Englewood Cliffs, N.J., 1979. xiv, 434 pp., illus. Paper, \$11.95.

Quantitative Cardiovascular Studies. Clinical and Research Applications of Engineering Principles. Papers from an institute, Urbino, Italy, Sept. 1977. Ned H. C. Hwang, David R. Gross, and Dali J. Patel, Eds. University Park Press, Baltimore, 1979. xii, 788 pp., illus. \$49.50.

X-Ray Spectroscopy. An Introduction. B. K. Agarwal. Springer-Verlag, New York, 1979. xiv, 420 pp., illus. \$39.90. *Springer Series in Optical Sciences*, vol. 15.

Zoonoses and the Origins and Ecology of Human Disease. Richard N. T-W-Fiennes. Academic Press, New York, 1978. xvi, 196 pp. \$19.

Personnel Placement

SCIENCE publishes each Friday, except the last Friday of the year. Advertising closing for a particular Friday issue is Wednesday, 3 1/2 weeks before. Advertising is accepted only in writing; no abbreviations. Also, personnel advertising is accepted only with the understanding that the advertiser does not discriminate among applicants on the basis of race, sex, religion, age, color, national origin, or handicap.

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POSITIONS WANTED

Biochemist—Organic Chemist, Ph.D. Extensive experience in protein chemistry, enzymology, immunochimistry, organic synthesis, analytical biochemistry (protein, peptides, amino acids, various natural products). Box 39, SCIENCE. X

Biologist, Reproductive. Seeks teaching/research position (physiology, reproduction, endocrinology) in Greater Boston/New Hampshire area. Experience, publications. J. P. Polidoro, Ph.D., Hickory Drive, Amherst, N.H. 03031. X

Biology of Aging. Ph.D. (chemistry), University of Illinois, Urbana, 1973. Lecturer in biological aging. University of Wisconsin-Madison, 1978 to 1980. Numerous publications. Research program in computer simulation modeling of systems and processes underlying biological aging. Box 41, SCIENCE. X

College Professor, Ph.D. (biology, Harvard, 1968); registered **Microbiologist** (food, pathogenic, immunology); seeks academic or laboratory position permitting research on ecological aspects of clostridial toxicology. Background includes photomicrography, electron microscopy, enzymology, and extensive teaching experience in microbiology-immunology-histology. Available July 1980. H. Lamont, 37 Park Avenue, Newton, Mass. 02158. X

General Biology, Genetics, Ecology, Botany, Plant Physiology. Broad teaching, research experience, M.S., plant physiology. Strong commitment to quality undergraduate education. Prefers 4-year or junior college. J. Mendenhall, 1305 8th Street, Greeley, Colorado 80631. X

Physiologist, Ph.D. Midcareer move. Extensive experience with chronic and acute animal studies; well-versed in recording techniques, surgical procedures, computer use. Wish to continue aggressive study of blood pressure regulation and hypertension. Box 51, SCIENCE. X

Russian-English Translator. Scientific, technical, commercial. Now accepting free-lance assignments. C. Parsons, 5914 Pulaski Avenue, Philadelphia, Pa. 19144. Telephone: 215-848-7084. X

29 FEBRUARY 1980

POSITIONS WANTED

Electron Microscopist/Zoologist, Ph.D. Presently director of EM laboratory. Expertise in TEM, SEM, ultracytochemistry, and ultrastructural autoradiography. Broad research experience in tumors and female reproductive system. Numerous publications. Seeking teaching/research or administrative position in university or research institute. Box 50, SCIENCE. X

Experienced **Science Editor** will make your writing (articles, reports, grant proposals, theses, books) more readable and effective. Proficient in fields of medicine, biology, environmental sciences, and engineering. S. Rose, P.O. Box 2053, Chapel Hill, N.C. 27514. Telephone: 919-933-0512. 2/29; 3/7

Toxicologist/Physiological Chemist (Ph.D.). Research and administrative background; industrial, product liability, and regulatory experience. Desires significant responsibility in toxicology/health impact assessment/regulatory compliance with major corporate organization. Reply to: Box 46, SCIENCE. 2/29; 3/7

POSITIONS OPEN

Medical University of South Carolina Department of Anatomy

Two faculty who will play a major role in the development of this department and school are currently being sought. They should have had post-doctoral experience and have developed a strong independent research program.

1) **NEUROBIOLOGIST** at assistant or associate professor level with research experience in neurophysiology or in neuroimmunology/neurochemistry at a cellular level. Teaching duties will be in the area of medical and graduate neurosciences.

2) **DEVELOPMENTAL BIOLOGIST**, level open, with research interests in cell surfaces and/or regulation of development. Preference will be given to someone conversant with modern biochemical and immunological methods as they apply to morphological problems. If a suitable senior candidate is identified, it is proposed that he/she will have a major role in selecting an additional junior level faculty member. Teaching duties will be in the areas of medical histology, embryology, and graduate level developmental and cellular biology.

Send résumé to: **Dr. Raymond Lund, Chairman, Department of Anatomy, Medical University of South Carolina, 171 Ashley Avenue, Charleston, South Carolina 29403.**

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ANATOMY

Assistant professor, tenure-track position. To take charge of dental anatomy program, September 1980. Superb research conditions. Salary negotiable. Apply before 1 May 1980 to: **Chairman, Department of Anatomy, University of Utah College of Medicine, Salt Lake City, Utah 84132. The University of Utah is an Equal Opportunity Employer.**

Applications are sought for **ASSISTANT PROFESSOR** (tenure-track) with specialization in **vertebrate behavior**. Ph.D. in zoology, biology, or closely related area required. Postdoctoral training preferred. Development of active research program essential. Applicants expected to have expertise in and commitment to undergraduate and graduate teaching. Send curriculum vitae, undergraduate and graduate transcripts, selected reprints, detailed description of teaching and research goals, and names of three references to: **Dr. A. W. Rourke, Head, Department of Biological Sciences, University of Idaho, Moscow, Idaho 83843.** Deadline for application is 15 March 1980. *The University of Idaho is an Equal Opportunity/Affirmative Action Employer and Educational Institution.*

ASSISTANT PROFESSOR. The Department of Physiology, University of South Carolina School of Medicine, seeks applications for a faculty position at the assistant professor level available 1 July. Desired area is neuro-renal-endocrine, but others will be considered. Candidates should have experience teaching medical students. Departmental strengths are cardiovascular and biomedical engineering. Applications, including three references, should be sent by 1 April to: **Dr. Francis L. Abel, Chairman, Department of Physiology, School of Medicine, University of South Carolina, Columbia, S.C. 29208.** An Equal Opportunity/Affirmative Action Employer.

POSITIONS OPEN

ANALYTICAL/ENVIRONMENTAL CHEMIST

A position for a chemist, biochemist, or environmental toxicologist is open to perform analyses of polycyclic aromatic hydrocarbons and their metabolites from aquatic organisms. The position requires a B.S. or M.S. degree with some experience in trace organic analysis and a knowledge of HPLC and/or GLC is desirable. The candidate must be a U.S. citizen. The salary range is \$12,200 to \$14,800 depending on experience. Send résumé, transcripts, names of references, and other supporting information by 1 April 1980 to:

Peter F. Landrum, Ph.D.
University of Georgia
Savannah River Ecology Laboratory
Drawer E
Aiken, S.C. 29801

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WESTERN CONNECTICUT STATE COLLEGE

ASSISTANT PROFESSOR. Tenure-track position for fall 1980. Ph.D. in biochemistry with formal training and experience in clinical chemistry and/or analytical chemistry required. Major assignment will be teaching lower division courses. Excellence in teaching is emphasized. Evidence of such teaching must be submitted and must also be included in three letters of reference. Please send complete curriculum vitae, including transcripts, by 31 March 1980 to: **Dr. Ronald S. Giordano, Chairperson, Department of Chemistry, Western Connecticut State College, 181 White Street, Danbury, Conn. 06810.**

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VISITING ASSISTANT PROFESSOR OF BIOLOGY

Applications are invited for a temporary, nonregular position at the assistant professor level for the 1980-1981 academic year.

The successful applicant will be expected to join or interact with ongoing research in **evolutionary or behavioral ecology** or in **plant systematics**.

Teaching responsibilities will include a course in the applicant's specialty area.

Send curriculum vitae, representative reprints, statement of research interests, and three letters of recommendation to: **Search Committee, Department of Biology, University of Missouri-St. Louis, 8001 Natural Bridge Road, St. Louis, Mo. 63121.** Applications close 7 April 1980. *An Equal Opportunity/Affirmative Action Employer.*

ASSISTANT PROFESSORS BIOMEDICAL ENGINEERING

The Department of Biomedical Engineering of The Johns Hopkins University School of Medicine has openings for faculty members who will participate in its research and teaching activities. Applicants should have a doctoral degree. They will be expected to develop an independently funded research program which emphasizes either biomedical instrumentation or the application of engineering and/or mathematical techniques to the analysis of biological systems. Teaching responsibilities will include the advising of undergraduate bioengineering students, organization of undergraduate courses for bioengineering students, and the supervision of graduate students. Candidates should send curriculum vitae, a list of publications, one or more representative reprints or a detailed thesis summary, and the names and addresses of three references (who will not be contacted without permission) by 1 May 1980 to: **Director, Department of Biomedical Engineering, The Johns Hopkins University School of Medicine, 522 Traylor Building, 720 Rutland Avenue, Baltimore, Md. 21205.** *The Johns Hopkins University is an Equal Opportunity/Affirmative Action Employer.*

ASSISTANT/ASSOCIATE PROFESSOR, IMMUNOLOGY. Tenure-track position in a 23-member Biology Department. Must establish a strong research program in immunology or related field and teach undergraduate course in immunology; expected to develop or participate in other undergraduate/graduate courses. Preference to candidates with post-doctoral experience, demonstrated teaching ability, and publications. Send curriculum vitae, bibliography, statement of research and teaching interests, and the names, addresses, and telephone numbers of five referees to: **Chairman, Immunology Search Committee, Department of Biological Sciences, North Texas State University, Denton, Texas 76203.** *An Affirmative Action/Equal Opportunity Employer.*

POSITIONS OPEN

ANATOMY TENURE-TRACK POSITION

The Department of Anatomy at Temple University School of Medicine is seeking applicants for two tenure-track positions at the rank of assistant professor. Candidates for one position will be expected to teach gross anatomy in the first year with added teaching responsibility of neuroanatomy in the second year. Candidates for the other position will be expected to teach microscopic anatomy in the first year with the added responsibility of teaching neuroanatomy in the second year. It is preferred that the research focus of applicants should be in the area of developmental biology, reproductive biology, membrane transport, or other aspects of cell biology. A Ph.D. or M.D. degree is essential; postdoctoral research experience is preferred but not essential. Starting date for each of these positions is 1 July 1980 or sooner.

Qualified applicants are encouraged to send their curriculum vitae and three letters of recommendation to:

J. Robert Troyer, Ph.D.
Professor and Chairman
Department of Anatomy
Temple University School of Medicine
3420 North Broad Street
Philadelphia, Pa. 19140

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ASSISTANT PROFESSOR OF PHARMACOLOGY

Applications are invited for a tenure-track faculty position in a research-oriented Department of Pharmacology. Minimal qualifications include a Ph.D. or M.D. degree with strong postdoctoral experience. Candidates must be capable of mounting a vigorous research program and participating in the teaching of medical, dental, and graduate students. Field of research interest is secondary to demonstrable research capability. Prefer September 1980. Send curriculum vitae to: **E. G. Anderson, Department of Pharmacology, College of Medicine, University of Illinois at the Medical Center, P.O. Box 6998, Chicago, Illinois 60680.**

To assure full consideration, apply by 15 April 1980.

The University of Illinois is an Equal Opportunity/Affirmative Action Employer and encourages applications from women and minorities.

ASSISTANT OR ASSOCIATE PROFESSOR REPRODUCTIVE PHYSIOLOGY

The Department of Physiology, University of Maryland School of Medicine, has an active group of research-oriented ovarian and neuroendocrine reproductive physiologists. To increase the strength and diversity of this group we invite applications from individuals with a Ph.D. or M.D. degree for a tenure-track position at the assistant or associate professorship level, effective fiscal 1980-1981. This individual should have research interests in reproduction which complement those of the existing faculty. The candidate should show promise or demonstrated excellence in research and teaching abilities. Send curriculum vitae, summary of proposed research program, and names of three references to: **Dr. Charles A. Barraclough, Department of Physiology, School of Medicine, University of Maryland, Baltimore, Md. 21201.** *An Equal Opportunity/Affirmative Action Employer.*

The Department of Physiology, University of Maryland School of Medicine, invites applications for junior and senior faculty positions. Opportunities are available for the 1980-1981 academic year. We are particularly interested in candidates with distinguished research accomplishments in the following fields:

NEUROPHYSIOLOGY—Developmental neurobiology or CNS neurophysiology. Duties include teaching medical neurosciences.

CELL PHYSIOLOGY—Physiology of cell membranes or epithelia. Duties include teaching medical physiology.

Ph.D. or M.D. required. Level of appointment depends upon qualifications. Successful candidates will be expected to fulfill modest teaching responsibilities and establish vigorous independent research programs. Send curriculum vitae with description of research interests and career goals, list of publications, and names of three references to: **Dr. M. P. Blaustein, Chairman, Department of Physiology, University of Maryland School of Medicine, 655 West Baltimore Street, Baltimore, Maryland 21201.** *The University of Maryland is an Affirmative Action/Equal Opportunity Employer.*

POSITIONS OPEN

ASSISTANT PROFESSOR OF PATHOLOGY—The candidate should be an academically trained pathologist. Must be Board-certified in anatomic pathology and have had experience in research and in teaching medical students and residents. Experience in a specialized field is highly desired. Please reply to: **Chairman, Pathology Department, Temple University School of Medicine, 3400 North Broad Street, Philadelphia, Pa. 19140.** *An Equal Opportunity/Affirmative Action Employer.*

DEPARTMENT OF PHARMACOLOGY AND THERAPEUTICS UNIVERSITY OF FLORIDA COLLEGE OF MEDICINE

Applicants are invited for the tenure-track position of **ASSISTANT PROFESSOR**. Applicants must have an M.D. or Ph.D. degree with postdoctoral experience in research. The applicants will be expected to contribute equitably to the department's teaching efforts and to develop an independent research program. Anticipated starting date is 1 September 1980. Curriculum vitae, bibliography, and three letters of reference should be sent by 31 March to: **Dr. A. H. Neims, Chairman, Department of Pharmacology and Therapeutics, Box J-267, JHMHC, University of Florida, Gainesville, Florida 32610.** *We are an Equal Opportunity/Affirmative Action Employer.*

ASSISTANT PROFESSOR OF PHYSIOLOGY

The Department of Physiology is seeking a candidate holding an M.D. or Ph.D. degree with experience and interest in membrane transport processes. Field of interest can include theoretical, artificial model, cellular, or epithelial membrane transport systems.

Opportunities are available for both collaborative and independent research and for graduate and medical student teaching.

Please send complete curriculum vitae including publications and the names and addresses of three references to:

**Chairman, Membrane Transport Search Committee
Department of Physiology
Yale University School of Medicine
333 Cedar Street, SHM B-107
New Haven, Conn. 06510**

Applications from women and members of minority groups are encouraged. An Equal Opportunity/Affirmative Action Employer.

ASSISTANT PROFESSOR IN PHYSIOLOGY AND BIOPHYSICS to take over duties of a faculty member on an RCDA. We prefer an M.D. or Ph.D. with some clinical and teaching experience; with research experience in neurophysiology and cardiac electrophysiology. Please send curriculum vitae, statement of research interest, and names of three references within 3 weeks of publication of this notice to: **Dr. Harvey Levy, Acting Chairman, Department of Physiology and Biophysics, Health Science Center, State University of New York at Stony Brook, Long Island, N.Y. 11794.** *Equal Opportunity/Affirmative Action Employer.*

ASSISTANT PROFESSOR/POSTDOCTORAL COGNITIVE SCIENCE

Assistant professor with specialty in artificial intelligence and computational linguistics available September 1980. Two interdisciplinary **postdoctoral positions** in language and information processing for 1980-1981. Contingent upon funding. Send résumé and three letters of recommendation to: **Professor Michael Arbib, Computer and Information Science, Graduate Research Center, University of Massachusetts, Amherst, Mass. 01003.** *An Affirmative Action/Equal Opportunity Employer.*

AUDIO-TUTORIAL COORDINATOR for the laboratory portion of freshman biology. B.S. degree required (M.S. preferred) in biological science. Experience and training in audio-tutorial instruction desirable. Duties include: (i) designing, in cooperation with faculty, instructional units including audio-visual materials, (ii) coordination of preparation of examinations and experiments for each week's laboratory, and (iii) supervision of teaching assistants and work-study personnel. The two laboratory courses to be coordinated have a combined enrollment of approximately 1000 students per semester. Salary: \$11,772 for 12 months. Submit curriculum vitae, transcripts, and three letters of reference to: **Dr. C. E. Freeman, Department of Biological Sciences, University of Texas at El Paso, El Paso, Texas 79968,** by 14 March 1980. Starting date: 1 September 1980.

POSITIONS OPEN

ASSISTANT PROFESSOR, COGNITIVE PSYCHOLOGY:

University of Massachusetts at Boston. Department of Psychology. Ph.D. required. Responsibilities include teaching undergraduate courses in cognitive area (for example, cognitive learning, perception, research methods) and graduate courses in cognitive applications for an interdisciplinary master's program for educators. Applicant is expected to have an active program of research with specialization open. Facilities include well-equipped laboratories with computer system and technical staff; \$16,000 to \$19,000 per year, depending upon qualifications. Please send letter, curriculum vitae, and three letters of reference to: **Search Committee, Psychology Department, University of Massachusetts, Boston, Boston, Mass. 02125,** by 21 March 1980. *An Equal Opportunity/Affirmative Action Employer.*

The Division of Visual Science at the Illinois College of Optometry announces a position opening at the **ASSISTANT PROFESSOR** level. Candidates must possess a Ph.D. and have a strong interest in both teaching and research. Teaching duties will include courses in visual perception, experimental design, and developmental psychology. Research interest should be in one of the following areas: infant vision, visual perception, or visual psychophysics. Preference will be given to candidates with a strong background in computers and instrumentation. Send curriculum vitae and three letters of recommendation to: **Dr. Kenneth Alexander, Chairman, Visual Science Search Committee, Illinois College of Optometry, 3241 South Michigan Avenue, Chicago, Illinois 60616.**

AVICULTURALIST/ASSISTANT CURATOR

The New York Zoological Society is accepting applications for an experienced aviculturist for the St. Catherine's Island Survival Center. The successful candidate will be responsible for the management of a propagation program for rare or endangered avian species. Salary commensurate with experience; 4 weeks of vacation and hospitalization. Interested candidates should send résumés to:

**James B. White
Personnel Manager
New York Zoological Society
185th Street and Southern Boulevard
Bronx, New York 10560**
An Equal Opportunity Employer

BIOCHEMISTRY. Applications are invited for a tenure-track position at the level of assistant professor to be filled on or before 1 July 1980. Applicants should have a Ph.D. in biochemistry, and postdoctoral training. Candidates must demonstrate potential for outstanding teaching ability and excellence in research in membrane biochemistry. Preference will be given to competence in molecular immunology and research in structure-function properties of membranes, or demonstration and characterization of cell surface receptors or other antigens in immunologically relevant systems. Successful candidate is expected to develop a research program, and to teach biochemical subjects to medical and graduate students. Send curriculum vitae, summary of present and projected research, and names and addresses of three people who may be contacted for reference to: **Dr. F. P. Inman, Box 19930A, College of Medicine, East Tennessee State University, Johnson City, Tenn. 37601.** *East Tennessee State University is an Affirmative Action/Equal Opportunity Employer, M/F.*

BIOLOGICAL SAFETY OFFICER, \$19,430 to \$30,790. To be responsible for a university biological safety program. M.S. degree or equivalent education and experience required. At least 3 years of experience in biological safety management is necessary. Requires public speaking and technical writing skills. Submit résumé with confidence requirements to: **F. J. Kilpatrick, Director, Environmental Health Service, The University of Iowa, 424 North Hall, Iowa City, Iowa 52242.** *An Affirmative Action Employer.*

POSITIONS OPEN

BIOCHEMIST: Recent Ph.D. to determine biochemical effects (proteases, phospholipases, cyclic nucleotides) of tumor promoters in mouse skin. Position is for 3 years with possible extension. Salary depends on qualifications (\$13,000 to \$16,000). Send résumé and three references to: **Dr. Sidney Belman, Box 817, Tuxedo, N.Y. 10987.**

BIOENGINEER

The Technology/Experiment Support Laboratory of Northrop Services, Inc., is seeking a qualified bioengineer (M.S. or Ph.D. with 3 to 5 years of experience) to fill a position of senior research analyst or scientist in our Life Sciences Laboratory at the Johnson Space Center. Bioengineering, mechanical or electrical engineering background in conjunction with biochemistry or physiology qualifications are required. Will be responsible for review of design or modification of instrumentation to be used for, or in support of, life sciences spaceflight experiments coordinated through the Biomedical Research Laboratories. Will also perform procedure development and evaluation, conduct ground-based and zero-gravity testing, provide documentation support, participate in crew training, and interface between principal investigators and various NASA or contractor organizations. Send résumé to: **Northrop Services, Inc., P.O. Box 34416, Houston, Texas 77034. Telephone: 713-488-2500. An Equal Opportunity Employer, M/F.**

UNIVERSITY OF ILLINOIS, CHICAGO

THE DEPARTMENT OF BIOLOGICAL SCIENCES invites applications for two tenure-track positions expected to be available in September 1980 at the rank of assistant or associate professor. Preference will be given to candidates with postdoctoral experience who have demonstrated outstanding potential for independent research in: (i) **IMMUNOBIOLOGY** or (ii) **MOLECULAR EVOLUTION**, with preference for nucleic acid studies of evolutionary problems. The applicants selected will be expected to teach undergraduate and graduate courses in their general fields and to direct M.S. and Ph.D. candidates.

Applications, including curriculum vitae, reprints, a statement of research plans, and three letters of reference, should be sent to: **Dr. S. K. Shapiro, Head, Department of Biological Sciences, University of Illinois, Box 4348, Chicago, Illinois 60680.** Closing date: 24 March 1980. *The University of Illinois is an Equal Opportunity/Affirmative Action Employer.*

RENSELAER POLYTECHNIC INSTITUTE

The **BIOLOGY DEPARTMENT** is considering major expansion in an area of **bioenergetics/photosynthesis**. Positions at the associate and assistant professor levels are contemplated. A Ph.D. or its equivalent, strong teaching interest, and demonstrated excellence in research are required. Postdoctoral experience and demonstrated ability to obtain extramural support are highly desirable. Send curriculum vitae and the names and addresses of three references to:

**Dr. Harry Roy
Biology Department
MRC 304**

**Rensselaer Polytechnic Institute
Troy, N.Y. 12181**

Rensselaer Polytechnic Institute is an Equal Opportunity/Affirmative Action Employer.

BIOLOGY/ZOOLOGY. Full-time tenure-track appointment to share in lecture and laboratory responsibilities in human anatomy and general zoology. Duties may include laboratory in physiology and bacteriology. Earned Ph.D. in zoology required. Post-secondary teaching experience in anatomy and general zoology preferred. Send application requests to: **Affirmative Action Officer, Winona State University, Winona, Minn. 55987.** Position open until filled. *An Equal Opportunity Employer.*

CHAIRPERSON

Department of Geology, University of Florida

The department is seeking an individual of outstanding academic achievement and administrative ability to assume the position of chairperson at the rank of professor. Salary and area of specialization are open. Submit inquiries or applications with curriculum vitae and names of three references before 1 April 1980 to: **Dr. D. L. Smith, Department of Geology, University of Florida, Gainesville, Florida 32611.** *The University of Florida is an Equal Opportunity/Affirmative Action Employer.*

POSITIONS OPEN

UNIVERSITY OF PENNSYLVANIA

The **DEPARTMENT OF BIOLOGY**, University of Pennsylvania, invites applications for a faculty position (assistant or beginning associate professor level) beginning 1 July 1980. Applicants should be active experimentalists in any area of genetics.

Applicants must be prepared to teach at the undergraduate introductory level as well as upper-class or graduate-level courses in their area of expertise. A previous announcement (*Science*, 17 November 1978, p. 793) describes the interests and goals of the department.

Please send curriculum vitae, brief outline of projected research program, reprints of your two most important publications, and names and addresses of three or more referees who are willing and competent to write letters of recommendation. Further, please arrange to have one letter sent immediately and directly by a recommender of your choice to:

**Dr. D. J. O'Kane, Chairman
Department of Biology
University of Pennsylvania
212 Biology Building/G5
Philadelphia, Pennsylvania 19104**

An Equal Opportunity/Affirmative Action Employer

BIOLOGIST

Due to sabbatical leaves within the department, the **Biology Department** is seeking to hire one person to teach full-time for fall semester 1980 with a possible extension to spring semester 1981. The person who fills this position should hold the Ph.D. The teaching responsibilities are general zoology or general biology and an advanced course in the area of the candidate's field of concentration. All interested candidates should submit a résumé, three letters of recommendation, and a statement of their teaching experience and interests to: **Dr. Kenneth P. Klatt, Department of Biology, Denison University, Granville, Ohio 43023.** *Denison University is an Equal Opportunity Employer.*

CHAIRMAN: DEPARTMENT OF OCEANOGRAPHY. The University of Maine at Orono (UMO) invites applications for the position of chairman, Department of Oceanography. Oceanography is a graduate department offering the M.S. and Ph.D. degrees. Research activities of the eight current faculty include ecology of cold-water organisms, biogeochemistry, mariculture, and geological oceanography with emphasis on coastal processes. UMO, a land and sea grant institution with about 12,000 students, is the major unit of the university system and offers most of the graduate degrees. The university has priority goals in the broad area of marine sciences and a developing Center for Marine Studies which is broadly multidisciplinary and interdepartmental. The applicant must have an earned doctorate in an appropriate discipline and have demonstrated excellence in research. Previous success in extramural research funding is essential. A letter of application, résumé, and names of three referees should be received by: **Karl E. Webb, Dean, College of Arts and Sciences, University of Maine at Orono, Orono, Maine 04469** no later than 1 April 1980. *Equal Opportunity/Affirmative Action Employer.*

CHAIRPERSON

**DEPARTMENT OF BIOMEDICAL SCIENCES
ONTARIO VETERINARY COLLEGE
UNIVERSITY OF GUELPH**

Applications and nominations are invited for the above position which will become vacant on 1 July 1980. The department embraces the disciplines of physiology, anatomy, genetics, clinical chemistry, pharmacology, and toxicology. It is responsible for preclinical instruction within the D.V.M. program and for providing the required disciplinary courses to science students. It has a complement of 27 faculty members.

Applicants must hold an advanced degree at the doctoral level in one of the above disciplines and have a proven record of scholarship, teaching, and research. Administrative experience would be desirable.

The successful applicant will hold an academic appointment within the department at a rank commensurate with his/her experience and qualifications.

Applications and nominations will be accepted until 31 March 1980 or until the position is filled, and should be submitted to: **Dean, Ontario Veterinary College, University of Guelph, Guelph, Ontario, Canada N1G 2W1.**

Position subject to final budgetary approval.

DEAN OF THE COLLEGE OF ARTS AND SCIENCES GOVERNORS STATE UNIVERSITY

Governors State University invites applications and nominations for the position of dean of the College of Arts and Sciences. Governors State University, founded in 1969, is an upper-division, graduate-level university located about 30 miles south of the Chicago Loop. It has a present enrollment of approximately 4400 commuting students.

Responsibilities: The dean, the college's chief administrative officer, reports directly to the Provost/Vice President for Academic Affairs. The dean is responsible for leadership within the college and representation of the college's interests to the university in such areas as the continuing review and development of programs in the arts and sciences, especially liberal studies and professional development of faculty through research and scholarship.

Qualifications: Required: scholarship, evidenced by publications or creative works; a terminal degree (Ph.D. M.F.A.) in one of the disciplines represented in the College of Arts and Sciences; knowledge of current trends in liberal education and attendant problems of funding and enrollment pressures; 3 years of teaching experience; and at least 3 years of academic administrative experience in an accredited college/university. Desirable: administrative experience with graduate education and innovation in academic programs of higher education. Experience in working with students of minority and disadvantaged status.

Starting date: 1 July 1980.

Application deadline: No later than 24 March 1980. Submit three copies of curriculum vitae to:

**Professor R. B. Jessen, Chair
Dean of Arts and Sciences Search Committee
c/o Office of the Provost
Governors State University
Park Forest South, Illinois 60466
Telephone: 312-534-5000, extension 2450**

Salary is negotiable dependent upon qualifications.

Governors State University is an Equal Opportunity/Affirmative Action Employer and welcomes applications from minorities, women, and the handicapped.

VACANT POSITION DIRECTOR, INSTITUTE FOR THE MEDICAL HUMANITIES THE UNIVERSITY OF TEXAS MEDICAL BRANCH GALVESTON, TEXAS

The director is in charge of staff and programs and has the responsibility of designing and promoting the structure and the programs of the Institute and relating them to other elements of the Medical Center.

Candidate should be learned and experienced in the humanities and the social and behavioral sciences, particularly as regards professional training, teaching, and practice, and should be recognized as a person of sound medical understanding and experience. Candidates should show evidence of substantial scholarly accomplishments.

The director must be able to recruit persons of scholarly and pedagogic achievements or promise, attract fellows and graduate students, and guide, assist, stimulate, and support their work. The candidate will be expected to develop and maintain support from internal sources and appropriate state, federal, and foundation sources through local, regional, national, or international agencies, programs, and organizations. The director prepares and manages the Institute's budget and other fiscal matters.

The director must have or be qualified for tenure and full professorship, have sound skills in writing and teaching students in various branches and stages of development throughout the University Medical Center. Commitment to and participation in community, state, and national affairs as they relate to the work and mission of the Institute are vital.

Interested persons should contact: **Melvyn H. Schreiber, M.D., Chairman, Medical Humanities Search Committee, P.O. Box 146, Galveston, Texas 77550.** *University of Texas Medical Branch is an Affirmative Action Employer.*

POSITIONS OPEN

ATMOSPHERIC SCIENCES—ASSISTANT PROFESSOR. Applications are invited for a tenure-track 9-month academic appointment as assistant professor in the Department of Atmospheric Sciences, Oregon State University, beginning 15 September 1980. Salary range: \$15,000 to \$17,000. This person's primary teaching duties are senior-level courses in synoptic analysis and weather forecasting, and graduate courses in advanced analysis and diagnosis. In addition, the successful candidate is expected to develop an active program of sponsored research in these or related areas and to supervise the work of graduate students. A Ph.D. in meteorology or atmospheric sciences is required, and preference will be given to applicants with teaching and research experience in weather analysis and prediction, or in observational and diagnostic studies. Candidates should submit an application (including complete curriculum vitae, a summary of graduate courses completed, an abstract of the Ph.D. dissertation, publications, and a statement of teaching and research interests) to: **Dr. W. L. Gates, Chairman, Department of Atmospheric Sciences, Oregon State University, Corvallis, Oregon 97331**, before 25 March 1980. The candidate must also arrange for three letters of recommendation to be sent directly to the department before the application deadline. *Oregon State University is an Equal Opportunity/Affirmative Action Employer and complies with Section 504 of the Rehabilitation Act of 1973.*

BOTANIST. University of North Carolina at Asheville (UNC-A) has a position for August 1980 for an assistant professor to teach full introductory biology sequence, general plant physiology, and general cytology or related courses. Ph.D. desirable. Strong interest in undergraduate teaching necessary. Send transcripts, three letters of reference, and résumé by 20 March to: **Dr. James D. Perry, Chairman, Biology, UNC-A, Asheville, N.C. 28804.** *An Equal Opportunity Employer, M/F.*

Cell and Tumor Biology of Human Colon Cancer—Postdoctoral Position. We immediately need for our active research group a creative, innovative, and motivated individual with a strong background in cell biology who is interested in the immunobiology and biochemistry of human colon cancer cell surface antigens. Experience in human tumor studies desirable. Salary range: \$12,000 to \$13,000. Send curriculum vitae, two letters of reference, and a paragraph describing your research interest to: **Box 33, SCIENCE.** *An Equal Opportunity Employer.*

FACULTY POSITION IN PULP AND PAPER RESEARCH. A senior research associate with primary responsibility to conduct fundamental research in mechanical and chemical pulping. Candidate should have Ph.D. and research experience in related field, with some teaching experience desirable. Send résumé to: **James Thorpe, Chairman, Search Committee, Empire State Paper Research Institute, State University of New York College of Environmental Science and Forestry, Syracuse, N.Y. 13210.** *An Affirmative Action/Equal Opportunity Employer.* Closing date: 15 April.

IMMUNOLOGIST—ASSISTANT PROFESSOR

Full-time faculty position available in the Department of Obstetrics and Gynaecology. Ph.D. degree required with strong interest in the immunology of reproduction. We are particularly interested in an individual with experience in infertility work who would also be able to start a human semen bank and perform research in the immunological aspects of male and female infertility. Ongoing clinical projects in the area of pregnancy maintenance and trophoblastic disease provide an opportunity for further collaborative research in the immunologic aspects of these conditions.

Send curriculum vitae to:

**Victor Gomel, M.D.
Professor and Chairman
Department of Obstetrics and Gynaecology
University of British Columbia
855 West 12 Avenue
Vancouver, British Columbia, Canada V5Z 1M9**

Two **JUNIOR FACULTY POSITIONS** available, Cell Biology Division, Cystic Fibrosis Program, Children's Hospital Medical Center, for Ph.D. or M.D. One with expertise in immunochemistry of complement proteins and the other in the structure and function of MHC genes. Send curriculum vitae to: **Harvey R. Colten, M.D., Children's Hospital Medical Center, 300 Longwood Avenue, Boston, Mass. 02115.** *An Affirmative Action/Equal Opportunity Employer.*

POSITIONS OPEN

DAIRY CATTLE EXTENSION SPECIALIST UNIVERSITY OF MASSACHUSETTS/AMHERST

Assistant/associate professor of animal science (tenure-track) to supervise and coordinate statewide dairy cattle extension programs, provide guidance and leadership for regional specialists and farm organizations, develop research program in area that would support and complement extension activities and the ongoing research of the department, and teach in area of expertise. Qualifications: Ph.D. in animal sciences with a dedicated interest in Cooperative Extension. Must be able to work with dairy farmers and other faculty and extension personnel. Dairy cattle management experience and farm background preferred. Applicants should submit complete curriculum vitae and have three letters of reference submitted by 1 April 1980 to: **Dr. James B. Marcum, Department of Veterinary and Animal Sciences, University of Massachusetts, Amherst, Mass. 01003.** *An Affirmative Action/Equal Opportunity Employer.*

ENERGY RESOURCES ADMINISTRATOR. State of Maryland unclassified position involves scientific project management to predict environmental and socioeconomic impacts of proposed electric power plants, make presentations at state and federal hearings, and contract management of scientific consultants. Extensive contact with technical community, commercial electric power industry, and the public. Prefer applicants with a doctorate in electrical engineering. Applicants with combinations of related regulatory and/or scientific experience, and advanced degrees in physical science and engineering will also be considered. Complete state benefit package. *An Equal Opportunity Employer.* Location: Annapolis, Md. Salary: commensurate with background. Apply (with résumé) to **Dr. Steven M. Long, Director, Power Plant Siting Program, Tawes State Office Building (B-3), Annapolis, Md. 21401;** telephone: 301-269-2261.

FACULTY POSITION DEPARTMENT OF BIOLOGY THE UNIVERSITY OF CHICAGO

A faculty position is available for a eukaryote geneticist trained in classical genetics and modern recombinant DNA technology. Faculty members are expected to maintain an active research program and engage in graduate and undergraduate teaching. Assistant professor and tenure-level appointments will be considered. At least 2 years of postdoctoral experience is required. Send curriculum vitae, a résumé of research and teaching interests, and the names of three references by 31 March 1980 to:

**Genetics Search Committee
Department of Biology
1103 East 57th Street
Chicago, Illinois 60637**

University of Massachusetts/ Boston Faculty Position in Environmental Sciences

Applications and nominations are invited for a position of an **ecosystems analyst** for September 1980. We are particularly interested in candidates with demonstrated ability to obtain independent research funding, an active research program, and the ability to assume the leadership role in an environmental science program. Preference will be given to candidates working on marine plankton ecology. Primary duties will include the heading and developing of the Environmental Science Program and contributing to the biology graduate (master's) program in applied marine ecology. We anticipate filling the position at the rank of full professor including the possibility to an appointment to a university chair.

Submit curriculum vitae, summary of research interests, and names and addresses of three references to: **Dr. Nevin Weaver, Chairman, Recruiting Committee, Department of Biology, University of Massachusetts/Boston, Boston, Mass. 02125.** *An Equal Opportunity/Affirmative Action Employer.*

POSITIONS OPEN



DEVELOPMENTAL BIOLOGIST

Assistant professor of biology to teach courses in developmental biology and cell physiology. Well-equipped laboratories available for research. Ph.D. and appropriate experience required.

The William Paterson College (WPC) of New Jersey is a multicultural state college, with a 250-acre wooded hilltop campus in Wayne, 20 miles west of New York City. Fully accredited, the college offers a comprehensive variety of undergraduate and graduate programs year-round. *WPC is an Affirmative Action/Equal Opportunity Employer.* Send résumé and any supporting materials including specific research interests by 14 March 1980 to:

**Dr. A. F. Shinn, Dean
School of Science
William Paterson College
Wayne, New Jersey 07470**



Position as **DIRECTOR**, Department of Diagnostic Radiology, Veterans Administration Hospital, Martinez, and **VICE CHAIRPERSON**, Department of Diagnostic Radiology, School of Medicine, University of California, Davis, is available. An M.D. degree and radiology Board-certification is required. Applicants should have a background in teaching, research, and administration as well as qualifications for appointment at the associate professor or professor level. Curriculum vitae should be submitted to: **C. John Rosenquist, M.D., Acting Chairman, Department of Radiology, University of California, Davis Medical Center, 4301 X Street, Room 109R, Sacramento, Calif. 95817.** The position will be available on 1 July 1980 and remain open until filled. *The University of California is an Equal Opportunity/Affirmative Action Employer.*

FACULTY POSITION

The Department of Preventive Medicine, College of Veterinary Medicine, University of Florida, has reopened the search for a **TOXICOLOGIST** to participate in teaching, research, and service programs of the department and college.

A detailed copy of the position description is available upon request.

Either the D.V.M. (or equivalent) or Ph.D. degree is required. Board-certification by the American Board of Veterinary Toxicology is highly desirable. Advanced training in toxicology, pharmacology, or biochemistry is required. Research experience, preferably (but not necessarily) with mycotoxins, pesticides, toxic metals, or poisonous plants is desired. Evidence of ability to publish research findings is required.

Letters of application or nomination should include curriculum vitae outlining citizenship, academic training, teaching and practice experience, present professional activities, and Board-certification. Also needed are a list of publications, a statement of professional goals, and the names of three persons who can provide letters of reference. Salary will be commensurate with training and experience and the academic rank of the successful qualified applicant. The closing date for applications is 1 April 1980. Correspondence should be addressed to

**Dr. Charles F. Simpson
Search Committee
College of Veterinary Medicine
Box J-125, JHMC
University of Florida
Gainesville, Florida 32610**

MARINE BIOLOGIST: Ph.D., preferably with postdoctoral experience; salary and rank negotiable. Expected to teach at undergraduate and graduate level, direct graduate students, and initiate nationally competitive research program. Research facilities located at the Galveston Laboratory of the National Marine Fisheries Service. Send curriculum vitae and three references to:

**Marine Biology Search Committee
Department of Biology
University of Houston
Houston, Texas 77004**

An Equal Opportunity/Affirmative Action Employer

POSITIONS OPEN

FACULTY POSITION

Ph.D., M.D., or D.D.S. graduate with training in human gross anatomy is needed for teaching medical, dental, and graduate students. Preference will be given to individuals with postdoctoral multidisciplinary research experience in cell biology, developmental anatomy, reproductive biology, or neurobiology. A tenure-track position is open at the starting assistant professor level with appointment beginning during summer months of 1980. Salary is within university guidelines and related to qualifications. Send curriculum vitae, bibliography, and names of three references to: **Dr. E. G. Rennels, Chairman, Department of Anatomy, The University of Texas Health Science Center, San Antonio, Texas 78284.**

An Equal Opportunity/Affirmative Action Employer

HEAD, BIOENGINEERING PROGRAM UNIVERSITY OF ILLINOIS AT CHICAGO CIRCLE CAMPUS

The University of Illinois at Chicago Circle Campus invites nominations and applications for the position of head of the Bioengineering Program and professor of bioengineering, beginning 1 September 1980. Candidates should possess a doctorate, a distinguished record of research, strong commitment to teaching commensurate with the professorial rank in this university, and demonstrated leadership ability. The program offers the bachelor's and master's degrees, and the Ph.D. degree through a joint program with the University of Illinois at the Medical Center campus. Salary is open. Send nominations and applications, including curriculum vitae, within 30 days of appearance of this ad and not later than 30 April 1980 to:

**Professor Wolfgang-M. Boerner
Chairman, Search Committee
Department of Information Engineering
University of Illinois at Chicago Circle
Box 4348
Chicago, Ill. 60680**

Telephone: 312-996-5489 or 996-2331

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

FACULTY POSITIONS OPEN COLLEGE OF AGRICULTURAL SCIENCES AND FOODS KING FAISAL UNIVERSITY HOFUF, SAUDI ARABIA Academic Year 1980-1981

The expanding College of Agricultural Sciences and Foods of King Faisal University invites inquiries from qualified applicants for the 1980-1981 academic year in the following fields: **Agronomy, Horticulture, Beekeeping, Poultry Science, Biology, Chemistry, Physics, Botany, Biochemistry, Agricultural Extension, Plant Pathology, Agricultural Economics, Animal Science, Animal Ecology, Dairy Science, Agricultural Engineering, and Water Resources and Climatology.**

PREREQUISITES: Master's or equivalent degree; practical and/or teaching experience. Knowledge of Arabic is helpful but not required. Language of instruction is English. Positions available September 1980; interviews scheduled with the dean in Houston, London, and Ottawa in April/May 1980.

SALARY RANGES: Approximate annual U.S. equivalent; professor, \$25,469 to \$33,965; associate professor, \$22,779 to \$28,973; assistant professor, \$18,570 to \$27,487; and lecturer, \$11,611 to \$16,035. Salaries are paid monthly in Saudi riyals. Substantial increase in these salaries is being considered for 1980-1981.

BENEFITS: Free furnished accommodations; substantial educational allowance for up to four children. Air tickets to and from Saudi Arabia once per year for family of four. Sixty-day paid summer holiday; yearly bonus; overweight allowance. No Saudi income tax. Contracts are for 1 year and are renewable.

Send curriculum vitae with current telephone number and the names, addresses, and telephone numbers of three references to:

**Dr. Hussein M. Elarosi
Dean, College of Agricultural Sciences and Foods
King Faisal University**

c/o Saudi Arabian Educational Mission, 2221 West Loop South, Houston, Texas 77027;

OR

c/o P.O. Box 2, Sudbury-on-Thames, Middlesex TW16 5JP England.

29 FEBRUARY 1980

POSITIONS OPEN

MOLECULAR BIOLOGY Ph.D. PLANT PROTOPLAST SCIENCE Ph.D. PLANT GENETICS-BREEDING Ph.D. PLANT BIOCHEMISTRY Ph.D.

The INTERNATIONAL PLANT RESEARCH INSTITUTE (IPRI) anticipates new positions throughout 1980. Assistant, associate, and senior research scientists who have an outstanding record of achievement and innovation, ability to solve tough problems, and spirit of adventure—here is a unique opportunity to work with others with the same record in San Francisco Bay area of California.

Send (in confidence) curriculum vitae, salary history, names of references, publications, and summary of your most innovative work to: **Oluf L. Gamberg, Ph.D., IPRI, 887 Industrial Road, San Carlos, Calif. 94070.**

Equal Opportunity Employer, M/F

MOLECULAR BIOLOGIST/GENETICIST with at least 2 years of postdoctoral experience and experience in teaching medical microbiology. Assistant professor level, expected to establish independent research program and direct graduate students. Teaching includes participation in medical microbiology course and development of alternate year one-semester graduate course in molecular biology/genetics. Salary competitive. Available 1 September 1980. Send curriculum vitae and names of three references to: **Dr. Arthur K. Saz, Department of Microbiology, Georgetown University Schools of Medicine and Dentistry, Washington, D.C. 20007.**

An Equal Opportunity/Affirmative Action Employer

NMR SPECTROSCOPIST, assistant professor level, to develop independent research program in biochemical and/or synthetic polymer field(s). Opportunity for collaborative research. Responsibilities include teaching in specialty area, and supervision of a 260 MHz multinuclear instrument. Send résumé, bibliography, summary of proposed research, and three letters of recommendation by 15 April to: **Chairman, NMR Search Committee, Michigan Molecular Institute, 1910 West St. Andrews Road, Midland, Mich. 48640. Telephone: 517-631-9450.** *An Equal Opportunity/Affirmative Action Employer.*

PROGRAM SPECIALIST

Position Available June 1980.

Assist Director, University Programs, with program development and program management. Duties include: program development, and design and implementation of programmatic evaluation tools, management and administration of ongoing multidisciplinary educational research and training programs; maintaining liaison with academic community, ORAU, and the Department of Energy to attain mutually beneficial goals; and utilization of technical expertise to assist DOE in the review of technical research proposals.

Qualifications: PhD in physical science, or MS or PhD in engineering and relevant experience in educational program development and administration. Ability to interact with University faculty and staff, and DOE management and facility representatives, extensive travel required.

Send resume with salary history and requirements, and names and addresses of references to:

**Employment Office
OAK RIDGE ASSOCIATED
UNIVERSITIES**

P.O. Box 177

Oak Ridge, TN 37730

An Equal Opportunity Employer

POSITIONS OPEN

PHARMACOLOGIST. The Department of Pharmacology and Toxicology of Wright State University School of Medicine seeks a faculty member with at least 2 years of postdoctoral experience and interest in teaching undergraduate and medical pharmacology. A willingness to participate in our interdisciplinary biomedical sciences Ph.D. program is desirable. The candidate should give evidence of expertise in biochemical and CNS pharmacology with an ability to attract significant research funding. Rank and salary will be commensurate with experience. Please submit applications, including curriculum vitae and two letters of reference, by 15 March 1980 to:

**Chairman
Department of Pharmacology and Toxicology
Wright State University School of Medicine
Box 927
Dayton, Ohio 45401**

The Wright State University is an Equal Opportunity Employer.

PHYSICAL OCEANOGRAPHY. Openings now exist at Nova University's Ocean Sciences Center for physical oceanographers at the assistant, associate, and professor levels. A demonstrated capacity for outstanding research in experimental or theoretical physical oceanography is essential. Project support through contracts and grants is expected of all faculty members. Send résumé, bibliography, and three letters of reference to: **Search Committee Chairman, Nova University Ocean Sciences Center, 8000 North Ocean Drive, Dania, Florida 33004.** *An Equal Opportunity/Affirmative Action Employer.*

PHYSIOLOGIST—Tenure-track position for Ph.D. at the assistant or associate level available September 1980. Person to teach vertebrate and comparative physiology to undergraduates and human physiology to graduate nurses. Send letter of application, résumé, three letters of recommendation, and official graduate and undergraduate transcripts before 15 April to: **Dr. R. F. Gehrig, Acting Chairman, Department of Biology, Russell Sage College, Troy, N.Y. 12180.** *An Equal Opportunity/Affirmative Action Employer.*

KING FAISAL UNIVERSITY COLLEGE OF MEDICINE DAMMAN, SAUDI ARABIA FACULTY POSITIONS OPEN 1980-1981

The expanding College of Medicine, now in its sixth year, is accepting applications from qualified men and women for the 1980-1981 academic year in:

CHEMISTRY	PATHOLOGY
BIOLOGY	EPIDEMIOLOGY
PHYSICS	MICROBIOLOGY
BIOCHEMISTRY	PARASITOLOGY
ANATOMY	PHARMACOLOGY
PHYSIOLOGY	COMMUNITY MEDICINE

Doctorate or equivalent degree required. Language of instruction is English. Interviews to be held in London, Houston, and Ottawa during February 1980.

Salaries are highly competitive and negotiable; comparable to other Saudi universities.

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

Send curriculum vitae with current telephone number and the names and addresses of three references to:

**Dr. Tawfiq Tamimi
Dean, College of Medicine
King Faisal University
c/o Saudi Arabian
Educational Mission
2221 West Loop South
Houston, Texas 77027**

OR

**c/o P.O. Box 2
Sunbury-on-Thames
Middlesex TW16 5JP England**

POSITIONS OPEN

MAMMALIAN PHYSIOLOGISTS AND BIOPHYSICISTS. Positions open for the 1980-1981 academic year in the areas of cardiovascular physiology, renal physiology, gastrointestinal physiology, endocrinology, reproductive physiology, and respiratory physiology at King Faisal University College of Medicine in Dammam, Saudi Arabia. Ph.D. and/or M.D. and at least 2 years of teaching experience. Salaries are highly competitive and benefits are excellent. Language of instruction is English. Send complete curriculum vitae with telephone numbers and three references to: **Dr. Tawfig Tamimi, Dean, College of Medicine, King Faisal University, c/o Saudi Arabian Educational Mission, 2221 West Loop South, Houston, Texas 77027.**

PHYSIOLOGIST—Temporary, nontenure-track position to teach vertebrate physiology courses starting August 1980. Ph.D. in physiology or zoology required, teaching experience preferred. Apply by 18 April 1980, by sending résumé, three letters of recommendation, and transcripts of graduate work to: **Dr. John F. Roberts, Department of Zoology, North Carolina State University, Raleigh, North Carolina 27650. Affirmative Action/Equal Opportunity Employer.**

POLYMERS/SURFACES RESEARCH

Postdoctoral research associate in adhesion, polymers, thin films, composites, especially via surface analysis (for example, ESCA or XPS, SEM, TEM, AES, ISS, SIMS). Send résumé, publications, and three reference letters to: **Dr. David W. Dwight, Materials Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, Va. 24061. Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL ECOSYSTEM RESEARCH

Research will focus on evaluating impact and energetic benefit/cost of forest management practices in southeastern watersheds. Qualifications include Ph.D. in environmental sciences, experience in systems ecology, research interest in energy or material flow through watersheds. U.S. citizens only. Curriculum vitae and three references to:

**Dr. S. M. Bartell
Savannah River Ecology Laboratory
Drawer E
Aiken, S.C. 29801
Telephone: 803-725-2472
An Equal Opportunity Employer**

NIH POSTDOCTORAL FELLOW. Position available in Immunology Research Unit beginning 1 July 1980. Research in immunologic aspects of occupational lung disease studying involvement of immunopharmacologic, environmental, and host factors. Send curriculum vitae, publications, and names of three references to: **Director of Training Program, Clinical Immunology Unit, Environmental Sciences Building, Tulane University Medical Center, 1700 Perdido Street, New Orleans, La. 70112. An Equal Opportunity Employer.**

Postdoctoral Position(s), immediately available for Ph.D. in pharmacology, organic chemistry, biochemistry, or physiology to study characterization and isolation of hormone receptors in relation to cellular aging. Position(s) renewable subsequent years. Competitive salary and excellent fringe benefits. Send curriculum vitae and three letters of recommendation to: **Dr. E. Meezan and Dr. H. D. Kim, Department of Pharmacology, University of Alabama in Birmingham, Birmingham, Alabama 35294. An Affirmative Action/Equal Opportunity Employer.**

POSTDOCTORAL POSITION available. Nitrogen fixation and photosynthesis in blue-green algae, for candidates with biochemistry and/or biophysics background. Send inquiry and résumé to: **Dr. Bacon Ke, Charles F. Kettering Research Laboratory, Yellow Springs, Ohio 45387.**

POSTDOCTORAL POSITION available immediately on the characterization of the mitochondrial membrane phosphate transport protein, its catalytic mechanism and its interaction with lipids. Salary to \$13,500 for 1 year with possibility of 1- to 2-year extension. Send curriculum vitae and references to: **Dr. Hartmut Wohlrab, Department of Cell Physiology, Boston Biomedical Research Institute, 20 Staniford Street, Boston, Mass. 02114. An Equal Opportunity/Affirmative Action Employer.**

POSITIONS OPEN

POSTDOCTORAL POSITION. Available 1 July 1980 to study ocular secretory IgA mechanisms in humans and animals. Desirable that applicant has background in secretory IgA immunobiology with emphasis on immunization procedures to elicit secretory IgA, measurement of secretory IgA antibody, and immunofluorescence localization of secretory component and various immunoglobulins. Fellowship is for 2 years in the Department of Ophthalmology, Harvard Medical School, and the Department of Cornea Research, Eye Research Institute of Retina Foundation. Send curriculum vitae and three letters of recommendation to: **Mathea R. Allansmith, M.D., 20 Staniford Street, Boston, Mass. 02114.**

POSTDOCTORAL POSITIONS SCRIPPS CLINIC—BIOCHEMISTRY

Two positions are available effective 1 July 1980: (i) studies involve genetic, biochemical and biophysical analysis of mutations affecting mitochondrial energy transduction, and (ii) characterization and analysis of the respiratory properties associated with the immunological response of human granulocytes. Salaries are competitive. Send résumé which includes the names of three references to: **Dr. David L. Edwards, Department of Biochemistry, Scripps Clinic and Research Foundation, 10666 North Torrey Pines Road, La Jolla, Calif. 92037.**

Scripps Clinic and Research Foundation is an Equal Opportunity Employer, M/F.

POSTDOCTORAL POSITION—Enzymatic removal of DNA bases altered by chemical carcinogens. Isolation and purification of DNA N-glycosylases and endonucleases. In vitro repair of different portions of chromatin by purified enzymes. HPLC analysis. Please send curriculum vitae, brief description of research background and interests, and names and addresses of three references to: **David Goldthwait, Department of Biochemistry, Case Western Reserve University, Cleveland, Ohio 44106.**

POSTDOCTORAL POSITION available immediately. For study of the role of calcium, calmodulin, and cAMP in neurosecretion. Candidates should have strong background in biochemistry. Position is for 1 year subject to renewal for second year. Apply with curriculum vitae and three references to: **Dr. Carole J. Coffee, Department of Biochemistry, School of Medicine, University of Pittsburgh, Pittsburgh, Pa. 15261.**

POSTDOCTORAL POSITION available immediately to study proteinase-proteinase inhibitor interactions. Experience in protein chemistry/enzymology preferred. Support recommended through December 1982. Send curriculum vitae and three references to: **Dr. G. Michael Hass, University of Idaho, Moscow, Idaho 83843. An Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL POSITION for the study of the bioenergetics of rodent reproduction or the neural basis for the development of olfactory preferences in young rats. Salary: \$14,000. Send curriculum vitae and the names of three references to: **Dr. Michael Leon, Department of Psychology, McMaster University, Hamilton, Ontario, Canada L8S 4K1.**

POSTDOCTORAL POSITION. A postdoctoral position in combined biochemical and somatic cell genetic studies of the regulation of cholesterol biosynthesis will be available 1 July 1980. Ph.D. and 2 years of previous postdoctoral experience required. Background in enzymology and/or messenger RNA biochemistry desirable. Available for 18 months with continuation dependent on renewed grant support. Salary based on prior training and experience. Send curriculum vitae and names of three references to: **Dr. Michael Sinensky, Senior Fellow, Division of Cell Membrane Studies, Eleanor Roosevelt Institute for Cancer Research, 4200 East Ninth Avenue, B-129, Denver, Colorado 80262. An Equal Opportunity/Affirmative Action Employer.**

A POSTDOCTORAL POSITION is available for a period of 1 to 2 years to study mechanisms of action of peptides (substance P, somatostatin, endorphins) in mammalian spinal pain pathways using predominantly electrophysiological techniques. Send curriculum vitae and three reference letters by 1 May 1980 to: **M. Randic, Department of Veterinary Physiology and Pharmacology, Iowa State University, Ames, Iowa 50011.**

An Affirmative Action/Equal Opportunity Employer

POSITIONS OPEN

POSTDOCTORAL POSITIONS. Studies of acetylcholinesterase and receptor. Preparation of substrates and inhibitors, kinetics of hydrolysis and inhibition, labeling of active site and receptor. Salary: \$13,000. Send résumé and recommendations to: **Professor Saul G. Cohen, Department of Chemistry, Brandeis University, Waltham, Mass. 02254. Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL POSITION IN IMMUNOLOGY. Research involves study of immunologic aspects of multiple sclerosis and experimental allergic encephalitis. Recent Ph.D. in immunology preferred. Write: **Lynn E. Spitzer, M.D., Children's Hospital, 3700 California Street, San Francisco, California 94119.**

POSTDOCTORAL POSITION available immediately. Purification and characterization of endo- and exoglycosidases employing novel ligninids for affinity chromatography. Protein purification experience desirable. Minimum salary of \$10,500 is negotiable. Send curriculum vitae to: **Dr. K. L. Matta, Department of Gynecology, Roswell Park Memorial Institute, 666 Elm Street, Buffalo, New York 14263. An Equal Opportunity Employer, M/F.**

POSTDOCTORAL RESEARCH APPOINTMENTS are occasionally available in the Departments of Biochemistry, Biophysics and Medical Physics, Botany, Microbiology and Immunology, Molecular Biology, Physiology-Anatomy, and Zoology at the University of California at Berkeley (Berkeley, Calif. 94720). Appointments are normally made for 1 year, but with the possibility of renewals for a maximum of two more years. A description of the research interests of the faculty in each department is available from that department upon request, and highly qualified persons are invited to apply directly to the faculty member with whom they wish to work. If no position is available with that faculty member, the application will be circulated to others in the same department with similar research interests. Applications should include a résumé, a brief statement of research interests and goals, and the names and addresses of three references. *The University of California is an Affirmative Action Employer.*

POSTDOCTORAL RESEARCH ASSOCIATE available immediately for research in regulation of membrane lipid asymmetry in tumorigenic cells or for regulation of very low density lipoprotein secretion, physical properties, and degradation by lipoprotein lipase. Work involves cell culture, biophysical measurements (fluorescence probes, DSC), and lipid modifications. Send résumé and three letters of recommendation to: **Dr. F. Schroeder, Department of Pharmacology, University of Missouri, School of Medicine, Columbia, Missouri 65212.**

POSTDOCTORAL OR RESEARCH ASSOCIATE (FACULTY) POSITION available for biochemist with a background in lipid and protein biochemistry, lipoprotein metabolism, and separation of subcellular organelles. The position involves the isolation and characterization of lipoprotein particles of plasma and from livers. These biochemical studies will be correlated with morphological (light and electron microscopy) and immunocytological studies on the pathogenesis of fatty livers. Position is available immediately for a minimum of 2 years. Salary negotiable. Please send curriculum vitae to: **Dr. Phyllis M. Novikoff, Pathology Department, ALBERT EINSTEIN COLLEGE OF MEDICINE, 1300 Morris Park Avenue, Bronx, N.Y. 10461. An Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL TRAINING OPPORTUNITY, Ph.D. (anatomy, biochemistry, pathology, pharmacology, physiology, microbiology, and so forth)—two positions, \$13,000 per year. Applications are now being accepted for a new postdoctoral program. Current research emphasis is in molecular cell biology. The selected candidate will receive individualized instruction and will be responsible for teaching anatomical sciences. Send résumé and three references to:

**Dr. K. Lemone Yielding, Chairman
Department of Anatomy
University of South Alabama
College of Medicine
Mobile, Alabama 36688**

The University of South Alabama is an Equal Opportunity Employer.

POSTDOCTORAL TRAINING IN LIPID- AND ATHEROSCLEROSIS-RELATED RESEARCH

Training at the postdoctoral level is offered in the following areas under a grant from the National Heart, Lung, and Blood Institute:

Lipid interactions and membrane structures studied by NMR techniques; lipid-lipid and lipid-protein interactions in the regulation of lipolytic enzymes at interfaces; mass spectrometry of lipids; micro-methods of lipid separations and analysis by HPLC-MS.

Pathways and mechanisms of phospholipid metabolism; regulatory function of lysophospholipids and their analogs; control of lipid and lipoprotein metabolism by hypolipidemic drugs; cholesterol ester transport and hydrolysis in atherosclerosis; ocular lens function related to lipid and cation metabolism; nutrition and metabolism of unsaturated fatty acids; influence of dietary fat intake on prostaglandin biosynthesis; metabolism and function of furanoid acids; highly unsaturated fatty acids in micro-organisms; structure-function relationships of ionophores.

Cell culture and microbial biochemistry; lipid and carbohydrate metabolism in microbial infections; the control of intracellular Ca^{2+} level and Ca^{2+} flux in mitochondria; cellular and molecular changes in ischemia and infarct; lipid and carnitine metabolism in cultured heart cells.

Research training will be for 1 to 3 years, beginning after 1 July 1980, and will be supplemented with lectures by faculty and invited speakers. Minimum stipend: \$14,000. Trainees must be citizens, non-citizen nationals, or permanent residents of the United States and must have earned a Ph.D. or M.D. degree. To apply or obtain more information, write: Dr. R. T. Holman, Professor and Director, The Hormel Institute, University of Minnesota, 801 16th Avenue, NE, Austin, Minn. 55912. The University of Minnesota is an Affirmative Action/Equal Opportunity Educator and Employer.

Order a copy of the Proceedings of

FIRST SYMPOSIUM ON WAVE ENERGY UTILIZATION

(Price 250 Swedish Crowns, incl postage)

The Proceedings containing the 25 papers presented at the First Symposium on Wave Energy Utilization at Chalmers University of Technology in Gothenburg, Sweden 30 Oct to 1 Nov 1979 are available from:

Division of Ship Hydromechanics
Chalmers University of Technology
S-412 96 Gothenburg, Sweden

This International Symposium of over 100 delegates from 20 countries includes several different areas within the wave power field, such as hydrodynamical investigations; electrical generation, transmission and control; different converters and devices, both models and full scale; deep-sea mooring; descriptions of different research programmes and wave measuring.

Judging from the very positive reactions to the Symposium, this Proceedings of 550 pages will become a valuable reference in this field, where highly theoretical efforts may give practical results of great economic importance.

HEALTH CARE INDUSTRY Medical Affairs Clinical Coordinator

McGaw Laboratories is seeking qualified individuals to fill positions in the medical affairs department. The job title is Associate Clinical Coordinator and the basic responsibilities include:

1. Assist in the development and design of clinical investigation.
2. Develop and write clinical protocol.
3. Coordinate and monitor external clinical studies.
4. Evaluate clinical data for safety and efficiency.
5. Write study reports.

The position available is for an individual who has the ability to work independently and the capability to coordinate the above factors. Good interpersonal, written and verbal skills would be essential. If the nature of this position sounds interesting, please forward a copy of your resume to:



McGaw Laboratories

P.O. Box 11887, Dept. 7-100-A
Santa Ana, CA 92711

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AMERICAN HOSPITAL SUPPLY CORPORATION

Sr. Research Immunoparasitologist

Innovative scientific minds have made Merck & Co. what it is today—a leading, and still rapidly growing pharmaceutical and chemical manufacturer. Our Merck, Sharp & Dohme Research Laboratory now has an exceptional opportunity for a high caliber scientist who can contribute to important research programs in a new and expanding department of Immunology.

The professional we're seeking should have a PhD in Immunology or Biochemistry, a record of scientific and academic achievement, and experience with eukaryote membranes. Previous experience with protozoa is desirable, but not essential.

Projects include planning and conducting research on the pathogenic protozoa *Trypanosoma Cruzi* and *Leishmania*, particularly on their cell biology, membrane structure and immunogenicity.

An excellent salary and benefits program as well as a working environment of scientific challenge and career enrichment accompany this position. Send résumé to: S. R. Jenkins,



MERCK & CO., INC.

P.O. Box 2000, Rahway, New Jersey 07065

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POSITIONS OPEN

PHYSICIST

Applications are invited for a position of physicist in the Theoretical Astrophysics Division of the Smithsonian Astrophysical Observatory. Candidates should have extensive experience in one or more of the following areas: fundamental properties of dense matter, stellar evolution, applications of plasma physics to astrophysics, modeling of x-ray sources, general relativity, and cosmology. This appointment is comparable to that of a full professor and the candidate must have demonstrated outstanding ability in theoretical astrophysics. Applications should include the names of three scientists who may be approached as references.

Applications for this position must be received on or before 2 April 1980. Send to:

Smithsonian Astrophysical Observatory
60 Garden Street
Cambridge, Massachusetts 02138
Attention: P. S. Borden

For specific questions regarding this position, please telephone: Dr. Alexander Dalgarno at 617-495-7238.

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POSTDOCTORAL RESEARCH IN PULMONARY PHYSIOLOGY

Appointments immediately available for 1 year with the possibility of renewal. Applicant may pursue projects related to: pulmonary blood flow, fluid balance and pulmonary edema, transport across endothelial and epithelial membranes, and lung mechanics as related to fluid balance. Send curriculum vitae and names of two references to:

Dr. Aubrey E. Taylor, Chairman
Department of Physiology
College of Medicine
University of South Alabama
Mobile, Alabama 36688

POSTGRADUATE RESEARCH DEPARTMENT OF BIOLOGY PRINCETON UNIVERSITY

NIH postdoctoral training grant positions for recent Ph.D.'s in the areas of biochemical and genetic aspects of cell differentiation (Doctors T. Cline, E. Cox, A. Newton, and P. Schedl), cell biology and development (Doctors J. Bonner, E. Cohen, M. Steinberg, and G. Witman), and behavioral and population genetics (Doctors J. Gould, R. May, and W. Quinn) are available beginning early summer and fall 1980. Applications should include curriculum vitae and summary of research interest. Closing date: 31 March 1980. Inquiries or applications should be sent to: Dr. E. C. Cox, Chairman, Department of Biology, Princeton University, Princeton, N.J. 08544. Princeton University is an Equal Opportunity/Affirmative Action Employer.

DEPARTMENT OF PREVENTIVE MEDICINE WASHINGTON UNIVERSITY SCHOOL OF MEDICINE

Searching for PROFESSOR AND HEAD of Department of Preventive Medicine at Washington University School of Medicine, St. Louis, Missouri. Interest in epidemiology and research accomplishments are particularly important. If interested, please send curriculum vitae and complete bibliography to:

M. Kenton King, Dean
Washington University School of Medicine
660 South Euclid Avenue—Box 8106
St. Louis, Missouri 63110

Equal Opportunity Employer

RESEARCH ASSOCIATE. Position requires a recent Ph.D. in organic chemistry with experience and preferably postdoctoral training in synthetic organic chemistry. The candidate will participate in the design and synthesis of carbon-11 and fluorine-18 labeled radiochemicals for studies in nuclear medicine. The candidate will possess a broad interest in organic, medicinal, and biological chemistry and will participate in research relating to drug localization and metabolism. Send résumé to: Dawn Pei, Memorial Sloan-Kettering Cancer Center, 1275 York Avenue, New York, N.Y. 10021.

SYNTHETIC ORGANIC CHEMIST. Research assistant to join a research team synthesizing carbon-11 and fluorine-18 labeled radiochemicals for studies in nuclear medicine. Candidate should have a B.S./M.S. in chemistry with at least 2 years experience in synthetic organic chemistry. Interest in biological/medicinal chemistry is essential. Candidate will participate in research relating to drug localization and metabolism. Send résumé to: Dawn Pei, Memorial Sloan-Kettering Cancer Center, 1275 York Avenue, New York, N.Y. 10021.

POSITIONS OPEN

POSTDOCTORAL POSITION AVAILABLE

Available for 1 year beginning August to September 1980; for research on control of cerebral circulation. Previous experience in cardiovascular physiology desirable. Stipend dependent on postdoctoral experience.

Send curriculum vitae and references to:

Dr. R. R. Sonnenschein or Dr. E. H. Rubinstein
Department of Physiology
University of California
School of Medicine
Los Angeles, Calif. 90024

Affirmative Action/Equal Opportunity Employer. Minority and women candidates are encouraged to apply.

POSTDOCTORAL RESEARCH ASSOCIATE—Position available immediately for qualified candidate with a Ph.D. in microbiology or biochemistry for project dealing with the cell surfaces and extracellular products of streptococci. Send curriculum vitae with names of three references to: Dr. Gerald D. Shockman, Department of Microbiology, Temple University School of Medicine, 3400 North Broad Street, Philadelphia, Pa. 19140. *Equal Opportunity/Affirmative Action Employer.*

RESEARCH ASSOCIATE position available immediately for studies on mechanisms of phototransduction. Experience in electrophysiology, genetics, or biochemistry essential. Starting salary: \$13,668 and up, depending on qualification. Send detailed résumé and names of three references to: Fulton Wong, Ph.D., Marine Biomedical Institute, University of Texas Medical Branch, Galveston, Texas 77550. *An Equal Opportunity/Affirmative Action Employer, M/F/H.*

SCIENCE WRITER to assist several mathematicians and physicists in preparing expository text. Abstract mathematical relationships and their physical implications must be made accessible to the non-mathematical reader. Accuracy, clarity, and simplicity have the highest priority. An advanced degree in English is desired. Some formal training in mathematics or physics is essential. Chicago area. *An Equal Opportunity Employer. Box 49, SCIENCE.*

SENIOR NUTRITION RESEARCHER AND TEACHER

Position available August 1980; requires extensive laboratory experience in nutrition research and publications in refereed journals. Applicant must hold Ph.D. in biochemistry or nutrition, have college teaching experience, and qualify for rank of professor.

By 30 March 1980, send résumé to:

School of Human Ecology
Howard University
Washington, D.C. 20059

POSITION AS TEACHER OF FOODS OR FOOD SERVICE ADMINISTRATION

Ph.D. in foods, food science, or food service administration required; position requires teaching courses in introduction to food, meal management, cultural foods, and/or food service administration. Available August 1980.

By 30 March 1980, send résumé and reprints to:

School of Human Ecology,
Howard University
Washington, D.C. 20059

POSITIONS OPEN

RESEARCH ASSOCIATE

A 3-year position is available for a Ph.D. with an interest in pattern formation in insects, experience in microsurgery, and ability to make sophisticated electrical measurements. Starting salary: \$15,000. Send curriculum vitae and names of two references to: Box 47, SCIENCE. *Equal Opportunity/Affirmative Action Employer.*

RESEARCH ASSOCIATE

Position available July 1980. Supported by NIH research grant for study of purine and pyrimidine anti-metabolites. Recent M.D. or Ph.D. interested in cancer chemotherapy, biochemical pharmacology, drug development, and so forth. Before 1 April 1980, send curriculum vitae, area of interest, and the names of two references to: Dr. Robert E. Parks, Jr., Box B, Brown University, Providence, R.I. 02912. *An Equal Opportunity/Affirmative Action Employer.*

The U.S. Department of Agriculture's (USDA) Science and Education Administration is recruiting for a **RESEARCH ENTOMOLOGIST** position at the Insects Affecting Man and Animals Research Laboratory, Gainesville, Florida. This position will be filled at grades 11 or 12 with a possible salary range of from \$20,611 to \$24,703 per year. The incumbent conducts research related to the biology, ecology, and control of biting and nonbiting flies which adversely affect man and animal, by developing suitable integrated pest management (IPM) programs for fly suppression. Applicants must have knowledge of medical and veterinary entomology, insect biology and ecology, toxicology, and IPM programs; skills in statistics and simple population control modeling. Applicants should send résumés to: Barbara E. Rogers, USDA, SEA-AR, P.O. Box 53326, New Orleans, La. 70153 and should refer to Number 133 when applying. *The USDA, SEA-AR is an Equal Opportunity Employer.*

The U.S. Department of Agriculture's (USDA) Science and Education Administration is recruiting for a **RESEARCH ENTOMOLOGIST** position at the Insects Affecting Man and Animals Research Laboratory, Gainesville, Florida. This position will be filled at grades 12 or 13 with a possible salary range of from \$24,703 to \$29,375 per year. The incumbent plans, conducts, and evaluates research on a wide range of studies concerning insect pathology to determine the effectiveness and potential usefulness of insect diseases for the control of medically important insects, by developing effective, safe, and economical biological control agents. Applicants must have knowledge of insect pathology and medical entomology and skill in developing safe biocontrol agents. Applicants should send résumés to: Barbara E. Rogers, USDA, SEA-AR, P.O. Box 53326, New Orleans, La. 70153 and should refer to Number 131 when applying. *The USDA, SEA-AR is an Equal Opportunity Employer.*

The U.S. Department of Agriculture's (USDA) Science and Education Administration is recruiting for a **RESEARCH GENETICIST (INSECTS)** position at the Insects Affecting Man and Animals Research Laboratory, Gainesville, Florida. This position will be filled at grades 11 or 12 with a possible salary range of from \$20,611 to \$24,703 per year. The incumbent plans and conducts research investigations on the formal genetics and cytogenetics that are aimed at improving new and existing pest control technology. Incumbent will analyze biological data using statistical procedures and computer programming. Applicants must have knowledge of insect genetics, cytogenetics, population genetics, electrophoretic methods, and isoenzyme analysis. Applicants should send résumés to: Barbara E. Rogers, USDA, SEA-AR, P.O. Box 53326, New Orleans, La. 70153 and should refer to Number 132 when applying. *The USDA, SEA-AR is an Equal Opportunity Employer.*

STRUCTURAL GEOLOGIST

Established international consulting firm has immediate opening in the Pacific Northwest for a senior-level structural geologist. Applicants must have demonstrated ability to manage field investigations and integrate geologic and geophysical data into regional tectonic models. Ph.D. and minimum of 3 years of experience are preferred. Salary competitive and commensurate with experience and qualifications. Applicants should send résumé and names of three references to: Box 48, SCIENCE. *Position is offered by an Equal Opportunity/Affirmative Action Employer.*

Biomaterials Research Biologist

DAVIS and GECK, a leading producer of surgical sutures and medical products, is seeking a scientist to join its Animal Surgery Group.

THE SUCCESSFUL CANDIDATE MUST HAVE 2-5 YEARS EXPERIENCE IN BIOCOMPATIBILITY EVALUATION OF BIOMATERIALS.

DAVIS and GECK is a department of the Medical Research Division of American Cyanamid Company. Our location at Lederle Laboratories, Pearl River, N.Y., offers a broad range of recreational and cultural activities. Compensation is competitive and includes a liberal fringe benefits program.

Send résumé and salary history, in confidence to:

Ms. S. L. Johnson
American Cyanamid Company
Medical Research Division
Lederle Laboratories
Pearl River, N.Y. 10965



American Cyanamid Company

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RESEARCH MICROBIOLOGIST CAWTHRON INSTITUTE NELSON, NEW ZEALAND

The Institute is engaged in basic and applied microbiological research on the utilisation of wastes and natural resources, on transferable antibiotic resistance and on transformations of organic materials and the movement of nutrients of concern in water and soil quality.

We seek a Ph.D. qualified graduate of proven research ability to develop a programme of research in fermentation related to the development of energy fuels and potential industrial products from natural and waste resources. The appointee will be expected to work independently and should have a sense of human relations, be cooperative, and have good organisational ability.

Cawthron Institute is an independent organisation located in an attractive coastal town and provides pleasant working conditions in modern well-equipped laboratories. It maintains a high calibre consultant analytical laboratory with good instrumentation.

The position will be for an initial 3 year appointment with the possibility of permanent appointment. Salary will be in the range \$NZ13-18,000 depending on qualifications and experience. Advancement is based in scientific merit.

A contributory pension scheme is available, and assistance may be provided for removal of household effects.

Application (3 copies), including curriculum vitae, health certificate, photograph, list of publications, description of previous experience, and the names of three professional referees with whom the applicant has worked, should be addressed to the Director, Cawthron Institute, P.O. Box 175, Nelson, New Zealand.

Applications close in Nelson on 30 April 1980.

Fisheries Oceanographer

Kuwait Institute for Scientific Research, a rapidly expanding institute for applied science and technology, is currently seeking a Fisheries Oceanographer.

Your duties will include the supervision and implementation of oceanography research activities, with particular emphasis on the physical, chemical and biological oceanography of Kuwait and Arabian waters and the effects of the environment on fish populations.

The candidate we seek should have either a PhD in Oceanography with a minimum of 5 years' experience, or an MS in Oceanography with a minimum of 9 years' experience in oceanographic work. Fluent oral and written English is required.

Kuwait Institute offers attractive salaries commensurate with qualifications and experience, furnished housing, liberal fringe benefits including round trip air tickets and free medical care.

If interested, please airmail your resume, no later than one month from the date of this publication, to: **Personnel Manager, Kuwait Institute for Scientific Research, P.O. Box 24885, Safat, Kuwait.**

Kuwait Institute for Scientific Research

The Bio Logical Approach

**Fermentation engineers - chemical engineers
enzymologists - microbiologists
molecular geneticists - biochemists**

Bio Logicals is a young, vigorous and successful company working on process and product development in the field of molecular biology. We need well-qualified result-oriented people, and we will support them with a stimulating environment, well-equipped facilities, and good salaries and benefits. Our work is centred in Toronto and Ottawa, cities well-endowed with cultural, recreational and educational resources.

Current projects include the development of new bacteria and yeasts using molecular cloning techniques. Our products have applications in agriculture, health care and industrial chemistry.

We are interested in hearing from candidates with PhD qualifications, preferably with some industrial experience. Please send résumé, publication list and names of three references to the Personnel Director, Bio Logicals Inc., 20 Victoria St., Suite 405, Toronto, Ontario, Canada M5C 2N8.

Bio Logicals
An equal opportunity employer.

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POSITIONS OPEN

RESEARCH ASSISTANT PROFESSOR position open: nontenure-track. Applicant must have at least 5 years of experience in application of EPR and NMR to enzymatic reactions. Please send applications by 31 March 1980 to:

Dr. David R. Trentham, Chairman
Department of Biochemistry and Biophysics
University of Pennsylvania
School of Medicine /G3
Philadelphia, Pa. 19104

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MASSACHUSETTS GENERAL HOSPITAL AND HARVARD MEDICAL SCHOOL

RESEARCH TRAINEESHIPS and RESEARCH ASSOCIATE POSITIONS are available in the Departments of Surgery, Pediatrics, Pathology, and Anesthesia at the Massachusetts General Hospital. The major areas of interest are:

- 1) The molecular mechanisms regulating protein synthesis in tissue repair and regeneration,
- 2) The biosynthesis and catabolism of collagens, extracellular matrix glycoproteins, and proteoglycans, and
- 3) Surgical metabolic research involving the regulation of substrate, energy and protein metabolism in vivo.

The traineeships are restricted to applicants who are U.S. citizens or who hold permanent immigrant visas. For further information, please forward curriculum vitae and the names of three references to:

Dr. David A. Swann
Department of Surgery
Massachusetts General Hospital
Boston, Mass. 02114

The California Space Institute of the University of California has an opening on the San Diego campus for a **SCIENTIST OR ENGINEER** with demonstrated background in research on the production of useful materials in the space environment. Topics may range from preparation of solid-state materials in low *g* vacuum environment to mining and extraction of lunar materials, or solar power systems in space. We seek an independent worker with the eventual goal of building a research group in this field. Assistant or associate research, rank and salary commensurate with experience. The associate research level also requires demonstrated experience in this scientific area. Submit résumé, bibliography, and a brief account of research interests to: **California Space Institute, University of California, San Diego, A-030, La Jolla, Calif. 92093.** *The University of California, San Diego, is an Equal Opportunity/Affirmative Action Employer.*

Applications sought for **STAFF POSITION** in the Section of Surgical Pathology, University of Southern California School of Medicine, and Los Angeles County-University of Southern California Medical Center. Salary and rank commensurate with experience. California license and previous training in surgical pathology required. Candidate should have a strong interest in teaching and scholarly activity. Reply to: **Chairman, Department of Pathology, 2025 Zonal Avenue, Los Angeles, California 90033.**

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TECHNOLOGY AND PUBLIC POLICY

The Department of Engineering and Public Policy of Carnegie Institute of Technology, the Social Science Department of the College of Humanities and Social Science, and the School of Urban and Public Affairs, Carnegie-Mellon University, have one or more joint faculty openings: (i) for applied social scientists interested in doing collaborative policy research with engineers or (ii) for engineers interested in doing collaborative policy research with social scientists. Problem areas of interest include automation and industrial productivity, social impacts of computers and telecommunications, product liability and safety, electric power load management, retrospective technology assessment, arms control and disarmament, and energy and environmental systems. Desirable areas of skill include decision analysis, optimization techniques, organizational analysis, and regulatory process and law. Send résumé with list of publications to:

Dr. Indira Nair
Department of Engineering and Public Policy
Carnegie-Mellon University
Pittsburgh, Pa. 15213

SYMPOSIUM

BELTSVILLE AGRICULTURAL RESEARCH CENTER SYMPOSIUM V—18 to 21 MAY 1980 BIOLOGICAL CONTROL IN CROP PRODUCTION

Invited lecturers will cover relevance of ecological theories to practical biological control, concepts, principles, and mechanisms of biological control of pests, mass production of biocontrol agents, strategies of biocontrol and general considerations (environment, safety, regulatory, economics, and IPM systems). Poster presentations may be submitted. Seating limited. For further information, contact: **E. M. Dougherty, Publicity Chairman, U.S. Department of Agriculture, SEA, PPI, IPL, Room 214, Building 011A, BARC-W, Beltsville, Md. 20705.**

WORKSHOP

DESIGN OF MODELS FOR SCREENING OF THERAPEUTIC AGENTS

A workshop on the design of models for screening of therapeutic agents, sponsored by the Frederick Cancer Research Center, will be held 19, 20, and 21 March 1980, at the Airlie Conference Center, Warrenton, Virginia. The purpose of this workshop is to address a number of questions about the validity of models, both in vivo and in vitro, as predictors of clinical utility in cancer therapy. The program will be broad and emphasize both basic research and clinical disciplines.

The general topics of the workshop include: the heterogeneous nature of malignant neoplasms, the heterogeneous nature of host animals, the use of autochthonous versus transplanted tumors, test systems for evaluating antitumor activity of therapeutic agents, and future prospects for the screening of therapeutic agents.

For further information, contact:

Jeanne Mowe, Workshop Coordinator
Frederick Cancer Research Center
P.O. Box B
Frederick, Md. 21701
Telephone: 301-663-7359

COURSES

SCANNING AND TRANSMISSION ELECTRON MICROSCOPY

Classes are designed to introduce the participants to the theoretical and practical aspects of electron microscopy. Primary emphasis will be on specimen preparation, operation of electron microscopes, and photographic and darkroom techniques. Tuition: \$595 for TEM, 2 to 13 June (2 weeks); \$520 for SEM, 16 to 20 June; and \$1,010 for the combined program, 2 to 20 June. For information, write or telephone: **Fred Lightfoot, Department of Anatomy, George Washington University, 2300 'I' Street, NW, Number 406, Washington, D.C. 20037; telephone: 202-676-2881 or 676-3511.**

TRAINING PROGRAM

POSTDOCTORAL TRAINING IN ENDOCRINOLOGY at West Virginia University Medical Center. New interdisciplinary program supported by NIH. Positions filled as available, depending on candidate qualifications and needs of laboratories involved. Participating faculty and research areas are: Margaret Albrink, M.D., Hyperlipidemia/Insulin Resistance; James Blair, Ph.D., Liver Carbohydrate Metabolism; Fred Butcher, Ph.D., Stimulus-Secretion Coupling; Roy Butcher, Ph.D., Pituitary-Ovarian Function; Howard Colby, Ph.D., Adrenal/Hepatic Monooxygenases; George Hedge, Ph.D. (Program Director), Thyroid/Adrenal Neuroendocrinology; Keith Inskeep, Ph.D., Utero-Ovarian Relationships; Michael Mawhinney, Ph.D., Androgen/Estrogen Action; and John Thomas, Ph.D., Androgen Actions/Toxicology. Application information and more detailed descriptions of research programs are available on request from: **Dr. George A. Hedge, Professor and Chairman, Department of Physiology, West Virginia University Medical Center, Morgantown, W.Va. 26506.** *West Virginia University is an Equal Opportunity/Affirmative Action Employer.*

PROGRAM

IMMUNOLOGY PROGRAM

Program leading to Ph.D. degree seeks highly qualified applicants interested in biochemical approaches to molecular immunology, immunobiology, immunochemistry, and immunogenetics. Research training available with recognized investigators. Stipends available on a competitive basis. Contact: **Dr. Robert Mettrione, Chairman, Graduate Committee, Department of Biochemistry, Thomas Jefferson University, 1020 Locust Street, Philadelphia, Pa. 19107.**

ASSISTANTSHIPS

GRADUATE ASSISTANTSHIPS. The Division of Cell and Molecular Biology, Department of Biological Sciences, offers assistantships carrying a 12-month stipend of \$5000, plus tuition waiver. A firm grounding in chemistry, genetics, or biochemistry is desirable. Information and application forms may be obtained from: **Division of Cell and Molecular Biology, Department of Biological Sciences, State University of New York at Buffalo, Amherst, N.Y. 14260.**

FELLOWSHIPS

GRADUATE FELLOWSHIPS in the neurosciences are available for fall 1980. Stipends are approximately \$5000 for 12-month appointments.

Send letters of inquiry to:

Dr. Vernon Pegram, Director
The Neurosciences Program
The University of Alabama in Birmingham
Birmingham, Alabama 35294

Equal Opportunity/Affirmative Action Employer

POSTDOCTORAL FELLOWSHIP—Postdoctoral fellowship available 1 June 1980 at the University of Massachusetts Medical School to study regulation of gene expression during development of *Dictyostelium discoideum*. Strong background in developmental biology of *Dictyostelium*, or the chemistry of nucleic acids and protein is essential. Send résumé to: **Dianne Crocker, Microbiology Department, UNIVERSITY OF MASSACHUSETTS MEDICAL CENTER, 55 Lake Avenue North, Worcester, Mass. 01605.** *An Affirmative Action/Equal Opportunity Employer.*

POSTDOCTORAL FELLOWSHIP position available for 2 to 3 years for Ph.D. or M.D. interested in the biology of endogenous C-type viruses. Send curriculum vitae to: **Dr. Christoph Moroni, Friedrich Miescher-Institut, P.O. Box 273, CH-4002 Basel, Switzerland.**

POSTDOCTORAL FELLOWSHIP IN CELLULAR NEUROBIOLOGY

NIH training fellowship for work on the cellular neurobiology of the lamprey central nervous system. Stipend for first-year fellows is \$13,380 plus fringe benefits. Send curriculum vitae and letters of reference to:

Warren O. Wickelgren, Ph.D.
Department of Physiology, C240
University of Colorado Medical School
4200 East Ninth Avenue
Denver, Colorado 80262

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POSTDOCTORAL HAND FELLOWSHIP DEPARTMENT OF ORTHOPAEDIC SURGERY UNIVERSITY OF PENNSYLVANIA

Applications are being accepted for a full-time hand fellow position. Qualifications required are Board-certification/eligibility, training in basic research, special interest in hand surgery, and willingness to spend up to one-half time in related research. Excellent facilities, salary, and fringe benefits. For further information, please contact: **F. William Bora, M.D., Department of Orthopaedic Surgery, 3400 Spruce Street, Philadelphia, Pa. 19104; telephone: 215-662-3344.** *An Equal Opportunity/Affirmative Action Employer.*

Tumor Radiobiologist

Staff Scientist position is available in a small tumor radiobiology group in the Division of Biology and Medicine, Lawrence Berkeley Laboratory, to study the radiobiology of tumors in animal systems, using the high-energy heavy-charged particle beams available at the BEVALAC. Experience with tissue culture techniques is necessary. Research presently ongoing and to be initiated include studies in cell survival, tumor volume response in mixed high and low-LET beams, effects of hypoxic cell sensitizers, and cellular repair and repopulation studies. Prefer applicable PhD.

Send complete curriculum vitae, publication list and names and addresses of three references to Dr. Stanley B. Curtis, c/o Ron Lowder, Personnel Dept., Lawrence Berkeley Laboratory, No. 1 Cyclotron Road, Berkeley, CA 94720.



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RESEARCH SCIENTISTS

THE AMOCO RESEARCH CENTER currently requires the immediate staffing of Scientists with Ph.D degrees and Postdoctoral experience in the following fields of specialization:

**Molecular Biology
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Enzymology**

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Photobiochemistry
Plant Cell Culture
Algology**

The above positions involve research toward industrial applications of new biology. Candidates should have recent Ph.D degrees or up to 2 years of Postdoctoral experience.

In addition to professional growth and outstanding opportunities, the AMOCO RESEARCH CENTER offers superior working conditions and is located in a highly desirable community just west of Chicago. An excellent compensation package and a comprehensive benefit package is provided. Please send a resume with a detailed qualifying letter in confidence to:

**Professional Recruiting Coordinator
AMOCO RESEARCH CENTER**
P.O. Box 400
Naperville, Illinois 60540



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JOHN E. FOGARTY INTERNATIONAL CENTER FOR ADVANCED STUDY IN THE HEALTH SCIENCES NATIONAL INSTITUTES OF HEALTH PUBLIC HEALTH SERVICE DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Opening Date: March 3, 1980

Closing Date: March 31, 1980

(All applications must be postmarked by closing date)

Director, John E. Fogarty International Center

The National Institutes of Health invites nominations and applications for the position of Director, John E. Fogarty International Center, NIH, who will have primary responsibility in coordinating the international research activities of the NIH, maintaining liaison with other Federal components and multinational organizations, and serving as the principal advisor to the Director, NIH, on all matters relating to the substance, quality and effectiveness of these programs.

This is a Civil Service position in the Senior Executive Service with a salary range from \$47,889 to \$50,112 per year, depending on qualifications. (Alternately, candidates may be eligible for appointment in the Commissioned Corps of the U.S. Public Health Service). The SES individual selected, if not presently in the Senior Executive Service, must serve a one-year probationary period. Mandatory qualifications are: the M.D. degree, or other professional degree(s) in a biomedical science such as Biology, Microbiology, or Chemistry, or equivalent amount of education and/or experience which demonstrates a broad knowledge and understanding of the major public health problems in this country and abroad, plus research experience in a biomedical science. In addition, candidates must meet the following managerial/executive

qualifications: experience necessary to select, manage, and motivate an staff and carry out organizational goals, including the ability to implement EEO objectives. Candidates who meet the mandatory qualifications will be further evaluated by the Search Committee on the extent to which they possess the following: experience in international health activities, scientific reputation/peer recognition, honors and awards, training and education, and the extent to which they exceed the level of managerial/executive qualifications specified above.

Applications (Personal Statement of Qualifications—SF-171) are to be sent to the Chairman, FIC Search Committee, National Institutes of Health, Building 1, Room 132, 9000 Rockville Pike, Bethesda, MD 20205. A current curriculum vitae, references and/or appraisals of performance, and bibliography must accompany all applications.

The National Institutes of Health is an equal opportunity employer.

**NATIONAL INSTITUTES
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COMBATING THE #1 KILLER

The SCIENCE Report on Heart Research

Jean L. Marx and Gina Bari Kolata

Cardiovascular diseases—diseases of the heart and blood vessels—are the leading cause of death in this country. They afflict more than 29 million people and are responsible for almost a million deaths per year in the United States alone. The American Heart Association estimates that the total economic costs of these diseases in 1978 will be in excess of \$28 billion.

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