

RESEARCH NEWS

(Continued from page 1141)

um, helium-3, appears in hydrothermal waters. Helium-3, trapped in the earth since the condensation of the solar nebula, slowly escapes into the ocean from ridges, and then into the atmosphere. It is chemically inert and its total flow into the world ocean from the ridges has been estimated from independent observations. Assuming the proportion of, say, potassium to helium-3 is the same in all hydrothermal waters, the flow of potassium from all warm springs in the ocean can be calculated from the proportion of potassium to helium-3 in the Galápagos springs and the total flow of helium-3 through the ocean. The method is not without possible errors. For example, the proportion of helium-3 to heat content of one of the four Galápagos vent fields is distinctly different from the others, suggesting that the leaching processes can vary from place to place. But a calculation of the flow of heat from ridges, based on the observed proportion of helium-3 to heat, falls between two independent calculations not based on helium-3, lending support to estimations of other fluxes.

Flux calculations for several elements help balance the inputs and outputs of some cycles that had been a bit embarrassing for geochemists, according to Edmond. The large amount of lithium in marine shales, the rock formed from marine muds, had been difficult to explain in light of the relatively small input from rivers, but it appears that hydrothermal waters contribute greater than ten times more than rivers do. All of the manganese deposited in the ocean can be accounted for by hydrothermal activity. And the need for a place to put the magnesium arriving in river water is met by its removal in the hot crust.

Unfortunately, problems with other cycles are not improved and, Edmond points out, some are actually aggravated. Marine chemists have been looking for a source of acid in the ocean to balance the input of alkalinity from the rivers. The net hydrothermal contribution of acidity turns out to be much too small to help. In contrast, the contribution of potassium is so large that its suggested uptake by the cold crust, which before had to accommodate only river-born potassium, would have to be doubled in order to accommodate all the potassium.

The obvious problem for geochemists, now that they have some first-hand evidence about what is going on within the ocean crust, is to find out what the contribution of each process is to the cycling

of a particular element. For example, how much potassium, on a global scale, is released by hot rocks beneath the ridge system and how much is taken up by the cold crust? The answers to such questions will require the collection and analysis of many more seawater and core samples, but the prospects for further studies are mixed.

Hydrothermal studies have considerable momentum, and hopes are high that new vent fields will soon be discovered. Expeditions are planned for return visits to all three of the ridge sites that have received close attention, including the Galápagos site. The first phase of joint French-American diving on the East Pacific Ridge at 21° north latitude in April found three large patches of empty

giant clam shells and rocks stained by hydrothermal waters in an area with a small apparent temperature anomaly. Elsewhere, other encouraging signs include suggestive variations in helium-3, temperature, and particulate metals suspended in the water, and a bottom photograph of a dense group of sea anemones.

Prospects for extensive deep drilling in the crust are not as bright. The *Glomar Challenger* is scheduled to conduct only limited drilling in the crust during the rest of 1978. No crustal drilling time is specifically allotted during tentatively scheduled operations in 1979 and 1980. The proportion of the post-1980 program devoted to crustal drilling is still very much in doubt.—RICHARD A. KERR

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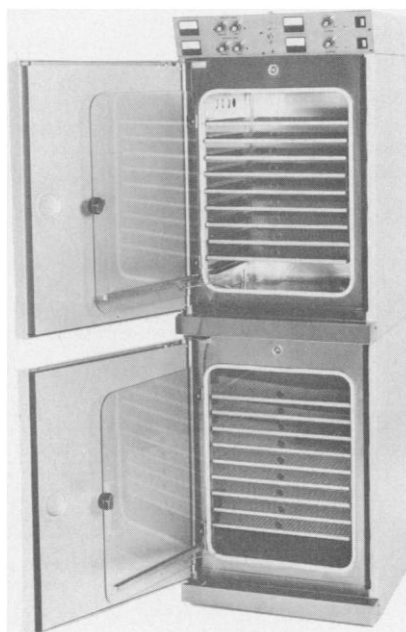
—RICHARD G. SOMMER

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Neuropeptide Radioimmunoassays describes materials for analysis of human beta endorphin, substance P, methionine enkephalin, and somatostatin. Immuno Nuclear. Circle 701.

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ASSOCIATE

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BIOLOGY. Assistant professor to teach general (ecosystems) ecology. Must have Ph.D. and strong background in plant science. Postdoctoral experience preferred. Teach general botany and develop courses in his/her area of expertise, and to establish an active research program involving undergraduate and graduate students at the master's level. Salary competitive. Send applications and curriculum vitae to: **Dr. James D. Haynes, Chairman, Department of Biology, State University College at Buffalo, 1300 Elmwood Avenue, Buffalo, N.Y. 14222.** An Equal Opportunity/Affirmative Action Employer.

BIO-ORGANIC CHEMIST. Ph.D. in bio-organic chemistry to perform original research and assist graduate teaching. Salary dependent upon experience. Send curriculum vitae and three references to: **Dr. Carl P. Schaffner, Waksman Institute of Microbiology, Rutgers University, P.O. Box 759, Piscataway, New Jersey 08854.** An Equal Opportunity/Affirmative Action Employer.

MICROBIOLOGIST-CHEMOTHERAPIST. Ph.D. research associate to perform original research and assist graduate teaching. Salary dependent upon experience. Send curriculum vitae and three references to: **Dr. Carl P. Schaffner, Waksman Institute of Microbiology, Rutgers University, P.O. Box 759, Piscataway, New Jersey 08854.** An Equal Opportunity/Affirmative Action Employer.

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BIOCHEMISTRY OF TRACE METALS

The **DEPARTMENT OF ENVIRONMENTAL HEALTH, of the COLLEGE OF MEDICINE, UNIVERSITY OF CINCINNATI**, is seeking a leader for its research unit concerned with the metabolic, nutritional, toxicologic, and other biologic aspects of trace metals. The program is broad in scope and has focused on a variety of environmental health problems. The appointment will be at the academic rank of **ASSOCIATE or FULL PROFESSOR.** A joint appointment in the Department of Biochemistry may be available. Please address all inquiries to: **Dr. E. C. Foulkes, Department of Environmental Health, University of Cincinnati Medical Center, 3223 Eden Avenue, Cincinnati, Ohio 45267.** An Affirmative Action/Equal Opportunity Employer.

BIOCHEMIST DEPARTMENT OF OPHTHALMOLOGY COLUMBIA UNIVERSITY

Position available for biochemist with doctoral degree and with background in physical biochemistry and radiation chemistry. Extensive experience (at least 15 years) in carbohydrate chemistry with special emphasis on structural analysis of complex glycoconjugates is essential. Candidate must have the ability to develop own program and will be expected to obtain funding in support of research. Full-time position with annual appointment as research associate.

Send curriculum vitae and names of three references to: **Director, Research Division, Department of Ophthalmology, 630 West 168 Street, New York, N.Y. 10032.** An Affirmative Action/Equal Opportunity Employer.

BIOCHEMISTRY

Faculty positions. The Department of Biochemistry invites applications for several new faculty positions. Salary and rank will depend on qualifications and experience. Preference will be given to individuals with strong research programs and experience in teaching medical and graduate biochemistry. Applications must include a curriculum vitae, references, a brief résumé of research interests, and future plans; also copies of major publications. Send applications to:

**Allan L. Goldstein, Ph.D., Chairman
Department of Biochemistry
The George Washington University
2300 Eye Street, NW
Washington, D.C. 20037**

BIOCHEMIST, Ph.D., assistant professor, September 1978. To teach biochemistry and organic chemistry. Send résumé, three letters, transcripts, and undergraduate research proposal to: **E. J. Walsh, Department of Chemistry, Allegheny College, Meadville, Pa. 16335,** before 30 June 1978. An Equal Opportunity Employer.

CHAIRMAN, DEPARTMENT OF ANATOMY. Applications are invited for this position, available June 1978. The department has a staff of 15 full-time and one part-time faculty, and six graduate students in its Ph.D. program. It has a strong commitment to both teaching and research. Applications, with a complete curriculum vitae, bibliography, and three references, should be sent to: **Alan D. Conger, Chairman, Anatomy Search Committee, Radiobiology Section, Temple University School of Medicine, 3420 North Broad Street, Philadelphia, Pa. 19140.** An Equal Opportunity/Affirmative Action Employer.

CLINICAL PATHOLOGIST. Opening for an assistant professor to participate in the department's teaching program and have clinical responsibilities at affiliated VA Hospital. Review of applications will begin 1 July 1978, and continue until position is filled. Address inquiries, including curriculum vitae, to:

**Philip S. Coogan, M.D., Chairman
Department of Pathology
East Tennessee State University
College of Medicine
Johnson City, Tenn. 37601**

East Tennessee State University offers Equal Opportunity in its employment, admissions, and educational activities and is an Affirmative Action Employer.

POSITIONS OPEN

CHAIRPERSON: BIOLOGY DEPARTMENT. Starting September 1978. Administrative responsibilities for small (four-person) department. Faculty position to teach ecology, plant anatomy and physiology, and general biology. Ph.D. with administrative and teaching experience required. Send résumé and three letters of recommendation to: **Sister Mary Matthew, Chairperson, Science/Mathematics Division, Mercyhurst College, 501 East 38 Street, Erie, Pa. 16501.** Affirmative Action/Equal Opportunity Employer.

SCIENCE DEPARTMENT—CHAIRMAN. Teach physics or biology. Provide academic leadership to five-member department. M.S. required; Ph.D. preferred. Teaching and/or industrial experience. Small city college with junior college program and upper division technology degrees. Send résumé and three letters of recommendation by 26 June to: **Dr. Philip I. Connors, Academic Dean, Central New England College, 768 Main Street, Worcester, Massachusetts 01610.** Telephone: 617-755-4314.

CHANCELLOR UNIVERSITY OF ARKANSAS MEDICAL SCIENCES CAMPUS

The Chancellor Search Committee invites applications and nominations for the position of chancellor, University of Arkansas Medical Sciences Campus, Little Rock, Arkansas. The campus consists of the Colleges of Health Related Professions, Medicine, Nursing, Pharmacy, Division of the University of Arkansas Graduate School, and the University Hospital.

The chancellor is the chief executive officer at the University of Arkansas Medical Sciences Campus. He/she is directly responsible to the president of the university for all activities of the campus and its related programs. The chancellor is expected to coordinate educational and health service programs, as well as to represent the objectives of the campus in university affairs locally, statewide, and nationally.

This position requires an individual who can provide administrative leadership and motivation for high quality education. The candidate should have experience in fiscal matters applicable to a health sciences campus, including health care delivery. An understanding of the social, economic, and political forces at work in relation to a statewide university system is necessary. Candidates must have an earned doctorate and responsible executive experience.

Applications and/or nominations should be submitted to: **Dr. Charles W. Oxford, Chairman, Chancellor Search Committee, University of Arkansas Medical Sciences Campus, Little Rock, Arkansas 72201,** no later than 15 August 1978.

An Equal Opportunity/Affirmative Action Employer

ONE-YEAR POSITION IN DEVELOPMENTAL BIOLOGY

The Department of Biology at the University of California, Los Angeles (UCLA) has one temporary teaching position available beginning September 1978. Applicants must have a Ph.D. degree and the qualifications to teach a large undergraduate upper division course in developmental biology, a separate laboratory course in developmental biology, and to participate in the introductory biology course. Applicants should send curriculum vitae, including names and addresses of three referees, to: **Search Committee, Biology Department, UCLA, Los Angeles, Calif. 90024,** before 23 June 1978.

An Equal Opportunity/Affirmative Action Employer

UNIVERSITY OF MICHIGAN MEDICAL SCHOOL DEPARTMENT OF DERMATOLOGY

A faculty position is available for a Board-certified or -qualified **DERMATOLOGIST** with experience in teaching and patient care. A candidate suitable for appointment at the associate or full professor level is preferable, although under unusual circumstances a candidate appointable at the assistant professor level would be considered. The candidate must be interested in a career in academic dermatology with emphasis on clinical dermatology. Resident and medical student teaching as well as administration. A specific area of clinical investigation is desirable. The applicant must be eligible for a Michigan license. The academic title and salary will be commensurate with experience and credentials. Reply to: **Box 214, SCIENCE, Code 200BO.** A nondiscriminatory, Affirmative Action Employer.

POSITIONS OPEN

CHEMIST, Ph.D. with strong physical chemical background and some training in biology, preferably immunology, to carry out research on new techniques in cellular immunology. Immediate opening.

B. F. Erlanger, Ph.D.
Department of Microbiology
Columbia University
College of Physicians and Surgeons
701 West 168 Street
New York, N.Y. 10032

CLINICAL PHARMACOLOGIST THE SQUIBB INSTITUTE FOR MEDICAL RESEARCH

We have a challenging opening in our Princeton, New Jersey, laboratories for an experienced clinical pharmacologist to participate in our new drug development program. The main thrust of our research effort is in the cardiovascular, anti-inflammatory (systemic and topical), and anti-infective areas. The facilities of two clinical pharmacology units are available for the conduct of human investigation. The position also carries with it the opportunity to work closely with preclinical scientists at all levels.

Candidates should preferably possess an M.D. degree although especially qualified Ph.D. degree holders will also be considered. The ideal candidate will have 3 years of research experience in the industrial setting and a strong record of achievement including publication in refereed journals. Less experienced candidates will also be considered.

The position offers excellent salary, benefits, and opportunity for advancement.

Please send curriculum vitae and complete details of your experience including salary history to: **E. R. Squibb & Sons, Inc., J. R. Convery, Department RAV, P.O. Box 4000, Princeton, N.J. 08540.**

An Equal Opportunity Employer, M/F

COMPARATIVE PATHOLOGIST—M.D., or D.V.M. with Ph.D. Pathology Board or ACVP eligibility or certification desirable. Experience in rodent pathology, carcinogenesis, clinical pathology, immunology, histochemistry, autoradiography, or electron microscopy helpful. Duties include: (i) development and review of experimental research protocols, (ii) involvement in multidisciplinary projects with some research time available, (iii) participation in histopathologic examination of tissues from rodents involved in carcinogenic, mutagenic, and teratogenic studies, (iv) teaching, (v) involvement in graduate and undergraduate education, (vi) involvement in interdisciplinary graduate toxicology program, and (vii) ability to relate, consult, and work with nine other veterinary and medical pathologists. Excellent clinical pathology and electron microscopy support. Salary commensurate with qualifications/experience. Send résumé to: **Director, University of Arkansas, Pathology Services Project, National Center for Toxicological Research, Jefferson, Ark. 72079.** *Equal Opportunity Employer.*

DEAN, COLLEGE OF ARTS AND SCIENCES FLORIDA STATE UNIVERSITY

Applications and nominations are invited for the positions of dean, College of Arts and Sciences.

The college consists of 18 departments, 12 in science and 6 in humanities, and several institutes and interdisciplinary programs. The college has 383 faculty members and is the largest among 15 schools and colleges within the university, which has a total of 1,050 faculty and a student enrollment of 22,000.

Candidates should have a doctorate in a discipline within the arts and sciences. They must also provide evidence of: (i) substantial scholarly achievement, (ii) teaching experience at both the undergraduate and graduate level, and (iii) administrative experience in an academic area. Exceptional leadership talents will be sought including ability to operate within the consultative tradition of a large complex university and an ability to build effective support for the college at all levels within and outside the university.

Applications and nominations should include curriculum vitae and addresses of references. All correspondence should be sent to: **Professor A. Gib DeBusk, Search Committee, Department of Biological Science, Florida State University, Tallahassee, Florida 32306.**

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

POSITIONS OPEN

North Texas State University invites applications for the following positions, which are authorized or expected to be authorized. Complete résumé with three references should accompany application. Send to: **Search Committee, IAS/North Texas State University, N.T. Box 5057, Denton, Texas 76203.**

ENVIRONMENTAL HEALTH—a program director level position in environmental health and toxicology requiring terminal degree in biochemistry, toxicology, or related area. Experience in research development of toxicological methods; ability to develop a strong research program essential.

ENVIRONMENTAL CHEMISTRY—research scientist in Environmental Chemistry Program requiring a Ph.D. in chemistry or chemical engineering with expertise in analytical methods applied to organic pollutants.

ENVIRONMENTAL ENGINEER (Ph.D.)—responsibilities require understanding of biological and chemical processes of potable and wastewater treatment. Bench scale or pilot plant experience and/or scholarly achievement essential. Teach half-time, develop research and graduate program in sanitary biology or microbiological processes associated with water treatment. Expertise in dynamic flow modeling and systems analysis highly desirable. Salary and rank open.

EXECUTIVE DIRECTOR for new Washington-based Scientists' Center to promote research and public interest activities on livestock care, wildlife preservation, animal experimentation, and other animal welfare issues. Knowledge of biological disciplines, dedication to humane principles, leadership, and organizational abilities essential. Persons wishing to do volunteer work are also encouraged to respond. Write, enclosing curriculum vitae, to: **Board of Trustees, Scientists' Center for Animal Welfare, Box 3755, Washington D.C. 20007.** See also: CALL FOR SUPPORT, p. 1198, column 2.

EXECUTIVE OFFICER AMERICAN ASTRONOMICAL SOCIETY

The American Astronomical Society will move its executive office to Washington, D.C., effective 1 March 1979. In connection with the move, and the retirement of the present executive officer, H. M. Gurin, we invite applications for the post of executive officer starting 1 February 1979. The individual chosen will have the responsibility to carry out the business of the society following the general directions of the elected officers of the society. We expect that the executive officer will represent the society in various capacities in Washington. The job will entail considerable interaction with the federal agencies, the Congress, and other groups and persons who are important to astronomy. He or she will also be responsible, under the direction of the officers and council, for maintaining a contact point with members, both personally and through correspondence, updating the membership list, preparing a Washington Newsletter, and so forth.

Applicants should have a strong scientific background. A Ph.D. in astronomy or a closely related science is desirable but not an absolute requirement. Some administrative experience is also desirable, together with knowledge of and willingness to learn about the operations of the legislative and executive branches of the federal government. Salary is negotiable, and commensurate with experience.

Applications containing curriculum vitae, work experience, and names of three references should be sent to: **Search Committee, American Astronomical Society, 211 FitzRandolph Road, Princeton, N.J. 08540** before 1 September 1978.

FACULTY POSITION OPEN

Assistant professor, plant pathology, 12-month tenure-earning position, primarily research. A scientist with a Ph.D. in plant pathology (or closely related discipline) is sought to develop a basic research program in plasmids from bacterial species of pathological significance. Candidates with postdoctoral experience who have demonstrable expertise with plasmid isolation, characterization, and interspecific transfer will be given preference. A broad working knowledge of bacterial plant pathogens is also desirable. Interested persons should send a complete résumé, including transcripts, three letters of recommendation, a statement of research interests, and reprints or preprints of published work, by 15 July 1978 to: **Dr. James F. Shepard, Department of Plant Pathology, Kansas State University, Manhattan, Kan. 66506.** *An Equal Opportunity/Affirmative Action Employer.*

POSITIONS OPEN

EXPERIMENTAL PATHOLOGIST

Litton Bionetics, Inc., is offering an unusual opportunity to an individual with a strong background in experimental veterinary pathology. A Ph.D. is required with good experience in electron microscopy and other experimental techniques. Board-certification is desirable but not a prerequisite. The task is to develop an experimental toxicologic pathology program that will enhance and broaden the scope of capabilities within the Biologic Safety Evaluation Division of Litton Bionetics. The means of achieving this will depend largely upon the initiative and energy of the person hired. Salary is negotiable and dependent upon qualifications. Please contact: **D. S. Loker, Manager, Industrial Relations, Litton Bionetics, Inc., 5516 Nicholson Lane, Kensington, Maryland 20795.** Telephone: 303-881-5600, extension 181. *An Equal Opportunity Employer, M/F.*

UNIVERSITY OF CALIFORNIA, IRVINE

The University of California, Irvine, Department of Psychiatry and Human Behavior, invites applications for full-time **FACULTY POSITIONS**. M.D. degree, 3 years of accredited psychiatric residency, California licensure, and evidence of scholarly productivity required. (i) Professor level, Chief of Psychiatric Services, to administer inpatient, outpatient, and liaison program; (ii) Assistant or associate professor level, family therapy and liaison with family medicine; (iii) Two positions at assistant or associate professor level to direct hospital programs and coordinate medical student teaching; and (iv) Four positions at assistant to professor level, to direct clinical teaching, and research programs in consultation/liaison psychiatry. One consultation/liaison position requires training in child psychiatry, and one requires experience in alcoholism programs. *Applications from all qualified candidates are welcome; minorities and women are encouraged to reply.* Send curriculum vitae and names of three references to: **Dr. E. Mansell Pattison, University of California, Irvine, Medical Center, 101 City Drive South, Orange, Calif. 92668.**

FACULTY POSITION

Undergraduate teaching position in physiology and anatomy available beginning 1 September 1978. Ph.D. required, preferably in physiology or related area. Must have high motivation for teaching; experience desirable. Responsibilities include instructing students of health sciences in human anatomy and physiology, and upper division course in vertebrate physiology; possible involvement in general biology program. *Women and minorities especially encouraged to apply.* Application deadline: 30 June 1978. Send résumés to: **Dr. Halit M. Kosar, Dean, Science and Engineering Division, Gannon College, Erie, Pa. 16501.** *Gannon College is an Equal Opportunity/Affirmative Action Employer.*

FACULTY POSITIONS available at Louisiana State University (LSU) in Shreveport.

The Department of Physiology and Biophysics invites applications for tenure-track positions at the assistant or associate professor level. The following areas of training are of special interest: neurophysiology (central control mechanisms and axonology), respiratory and gastrointestinal physiology. Applicants will be expected to teach in the medical physiology course and to develop an active research program. Candidates must have either the M.D. or Ph.D. degree and should submit curriculum vitae and names of three references to: **Dr. John N. Diana, Chairman, Department of Physiology and Biophysics, LSU School of Medicine in Shreveport, 1501 Kings Highway, Shreveport, Louisiana 71130.**

An Equal Opportunity Employer

FACULTY POSITION

Biochemical pharmacologist, M.D. or Ph.D., with experience in psychotropic drug metabolism or neurochemistry. Applications are invited for this tenure-track position at the assistant professor level. Teaching responsibilities for medical and graduate students. Candidates will be expected to mount an independent research program. The successful applicant will be appointed jointly in the Department of Psychiatry and the Department of Pharmacology and Toxicology. Outstanding physical facilities and opportunities for collaborative research. Send curriculum vitae and the names of three references by 1 September to: **Dr. Roger P. Smith, Department of Pharmacology and Toxicology, Dartmouth Medical School, Hanover, N.H. 03755.** *An Equal Opportunity/Affirmative Action Employer.*

POSITIONS OPEN

FACULTY POSITIONS for M.D.'s with special qualifications in fields of transplant, immunology, oncology, trauma, gastrointestinal surgery, plastic surgery, vascular surgery, pediatric surgery, thoracic and cardiovascular surgery, and neurosurgery. Also, emergency medical services.

Written only inquiries and applications should be directed to: **S. E. Ziffren, M.D., Professor and Head, Department of Surgery, University of Iowa College of Medicine, Iowa City, Iowa 52242.**

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

FACULTY POSITION available for human geneticist/biostatistician starting in fall 1978. Applicants should have a strong interest in theoretical aspects of quantitative genetics. Rank and salary commensurate with qualifications and experience. **POST-DOCTORAL FELLOWSHIP** (NRSA) with payback provision) in psychiatric genetics/theoretical population genetics also available starting fall 1978. Applicants for fellowship must be U.S. citizens or permanent residents with an M.D. or Ph.D. Send curriculum vitae, a detailed outline of past experience and present interests, and the names of three references to: **Theodore Reich, M.D., Department of Psychiatry, Washington University, School of Medicine, and the Jewish Hospital of St. Louis, 216 South Kings Highway, St. Louis, Missouri 63110. An Equal Opportunity/Affirmative Action Employer.**

UNIVERSITY OF MICHIGAN MEDICAL SCHOOL INTERNAL MEDICINE

Position available 1 July 1978 for **GENERAL INTERNIST**, assistant/associate professor of medicine. Applicant must be well-trained in general internal medicine and be, at least, eligible for the ABIM. Excellence in clinical care and teaching are required. Send reply to: **Box 211, SCIENCE. Code 4200DO. A nondiscriminatory, Affirmative Action Employer.**

HEAD OF PHYSICS DEPARTMENT

Texas A & M University is seeking an outstanding individual to serve as head of the Physics Department. Candidates should have demonstrated leadership ability, possess an outstanding research record, and have an understanding of the teaching and service obligations of a Physics Department in a large state-supported university. The successful candidate must have a strong desire to build an outstanding Physics Department.

The Physics Department presently has 40 faculty members (22 tenured) and 51 graduate students enrolled in master's and Ph.D. programs in nuclear, condensed matter, atmospheric, and atomic physics. Texas A & M University has grown from a total enrollment of 16,000 in 1972 to over 29,000 in 1978, of whom approximately 5,000 are graduate students. It ranks first in the southwest and eighteenth in the nation in research support.

Nominations and applications should include a résumé and the names of at least three references and should be submitted to the address below no later than 31 July 1978.

**D. H. Youngblood, Chairman
Search Committee
Cyclotron Institute
Texas A & M University
College Station, Texas 77843**

*Equal Employment Opportunity
through Affirmative Action*

HUMAN ANATOMY AND PHYSIOLOGY. Assistant professor in Department of Health Sciences to begin 1 September 1978. Undergraduate and graduate instruction in applied anatomy and physiology. Development of personal research program. Send résumé and list of references to: **Associate Dean H. G. Knuttgen, Sargent College of Allied Health Professions, Boston University, Boston, Mass. 02215. Boston University is an Affirmative Action/Equal Opportunity Employer.**

INFORMATION SCIENTISTS. Two positions available, each with M.S. in biological science, one emphasizing animal science, the other plant science. Laboratory experience desirable. Select, recover, and index R & D information in response to scientists' requests related to experimental work and company products. Full range of benefits and liberal salary; company provides relocation. Send résumé to: **Judith C. Leonard, Manager, Technical Information Services, AMERICAN CYANAMID COMPANY, Agricultural Division, P.O. Box 400, Princeton, N.J. 08540. An Equal Opportunity Employer, M/F.**

POSITIONS OPEN

FACULTY AND RESEARCH POSITIONS

The College of Mineral and Energy Resources (COMER) of West Virginia University, Morgantown, West Virginia, anticipates approximately 15 openings starting 1 July 1978, for faculty and faculty equivalent research positions in the following fields:

**Mining Engineering
Health and Safety Engineering
Petroleum Engineering
Mineral Processing Engineering
Extractive Metallurgy
Environmental Engineering
Rock Mechanics
Explosive Engineering
Mineral Resource Science
Mineral Economics
Geophysical Engineering**

Candidates should possess an earned doctorate or equivalent in industrial/research experience. Openings exist in all ranks at salaries ranging between \$15,000 and \$40,000 per annum. *Equal Opportunity Employer.* Send résumé to: **Syd S. Peng, Chairman, Faculty Search Committee, COMER, West Virginia University, White Hall, Morgantown, W.Va. 26506.**

FACULTY VACANCY—NUTRITION SCIENCE—

At advanced assistant professor level or above, depending on qualifications. Ph.D. in nutrition or related science and research experience essential; teaching experience desirable. Responsibilities include teaching undergraduate and graduate courses, developing a research program relevant to human nutrition, and student advising. Nine-month continuing, tenure-track appointment. Salary competitive and based on experience and qualifications. Applicants should send curriculum vitae and supporting documents and have two letters of reference sent by 15 July 1978 to:

**Dr. Helen Guthrie
Nutrition Program
The Pennsylvania State University
202 Henderson Human Development Building
University Park, Pa. 16802**

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

INORGANIC/ORGANIC CHEMIST. MEDPREP. The School of Medicine, Southern Illinois University at Carbondale, invites applications for a faculty position at the assistant professor level. MEDPREP is a special medical education preparatory program for minority and disadvantaged students pursuing a career in medicine or dentistry. A strong background teaching inorganic and organic chemistry for pre-professional students is required. Experience and commitment in working with minority and disadvantaged students desired. Candidates must hold the Ph.D. degree in chemistry. This position is available immediately and is a continuing position with time accruing to tenure in the School of Medicine. *Women and minority group members are encouraged to apply.* Please submit curriculum vitae and three names of references by 15 July 1978 to: **Director, MEDPREP, School of Medicine, Southern Illinois University, Carbondale, Illinois 62901.**

An Equal Opportunity/Affirmative Action Employer

UNIVERSITY OF MICHIGAN MEDICAL SCHOOL DEPARTMENT OF PATHOLOGY

Position available as soon as possible for **INSTRUCTOR/ASSISTANT PROFESSOR.** Individual with M.D., and Board-certification in clinical and anatomic pathology. Position involves teaching and research responsibilities. Candidates will direct several clinical laboratories at Wayne County General Hospital, perform duties in surgical pathology, and teach house staff. Reply to: **Box 212, SCIENCE. Code 1300FO. A nondiscriminatory, Affirmative Action Employer.**

The Department of Rehabilitation Medicine at the College of Physicians and Surgeons, Columbia University, seeks an established **INVESTIGATOR** in the field of thermoregulation and related areas. The candidate must have a Ph.D. or M.D. degree. He/she must be committed to research but also maintain an interest in teaching. A background in bioengineering is desirable. Faculty appointment is available at a rank commensurate with experience. Send application with curriculum vitae and personal references to: **Dr. John A. Downey, Chairman, Department of Rehabilitation Medicine, Columbia-Presbyterian Medical Center, 630 West 168 Street, New York, N.Y. 10032. An Equal Opportunity/Affirmative Action Employer.**

R & D CHEMISTS

POLYSACCHARIDE CHEMIST—Ph.D. biopolymer chemist with significant academic and research experience in polysaccharide chemistry. Challenging assignment involving characterization of complex carbohydrate biopolymers, their interactions and functional applications performance in food systems. Broad research competence required in starch, gum, food fiber, hydrocolloid, and polysaccharidase chemistry. Full project leadership responsibility for a self-motivated creative scientist.

BIOPHYSICAL RESEARCH CHEMIST—

Ph.D. chemist, with minimum of 3 years of experience in biophysical research for challenging position in basic physical chemistry. Sound academic background in advanced physical chemistry and thermodynamics and functional skills for the development and application of colorimetry, rheology, x-ray diffraction, water equilibria measurements, and so forth, to food and chemical systems. Some training or research in biopolymers, colloid or food chemistry desirable.

Outstanding corporate research facility in north suburban Chicago.

Send confidential résumé with salary requirements to:

Director of Personnel Administration



**Research & Development
801 Waukegan Road
Glenview, Illinois 60025**

An Equal Opportunity Employer, M/F

FACULTY POSITIONS, UNIVERSITY OF PITTSBURGH SCHOOL OF PHARMACY

Applications are invited for the following tenure-track, full-time faculty positions in the Department of Pharmaceutics of the University of Pittsburgh School of Pharmacy. All appointments to begin 1 August 1978. (i) **Chairman, Department of Pharmaceutics:** applicants should have a Ph.D. in pharmaceutics, be actively conducting research in one of the several areas of pharmaceutics, and be willing to participate in the teaching program at the undergraduate and graduate levels. A bachelor's degree in pharmacy is desirable and a record of successful experience in teaching and research is essential. The salary and level of appointment will be dependent upon the qualifications and experience of the applicant. (ii) **Assistant professor in pharmaceutics:** applicants should possess a baccalaureate degree from an accredited college of pharmacy, a Ph.D. degree in pharmaceutics, and must be qualified to teach undergraduate and graduate courses in dosage form technology and physical pharmacy. A strong background in analytical chemistry is desirable. The successful applicant is expected to participate in graduate program and develop independent research program. The salary will be commensurate with qualifications and experience. (iii) **Assistant professor in analytical chemistry/drug analysis:** applicants should have at least 2 years of teaching/research experience after their Ph.D. degree with special expertise in the application of modern analytical techniques (UV-VIS and atomic absorption spectrometry, GLC, HPLC, radioimmunoassay, and so forth) to drug analysis, bioavailability, pharmacokinetics, and drug metabolism. The successful candidate is expected to participate in teaching at undergraduate as well as at graduate level. Excellent opportunities for participation in graduate programs and collaborative research projects in other pharmaceutical and biomedical sciences. The salary will be commensurate with qualifications and experience.

Interested candidates should send a letter of application, prior to 30 June 1978, accompanied by a curriculum vitae with a complete bibliography, brief outline of current research interests and future research objectives, and names and addresses of at least six persons for reference to: **B. N. Dixit, Ph.D., Acting Dean, University of Pittsburgh School of Pharmacy, 1100-3 Salk Hall, Pittsburgh, Pa. 15261.**

An Equal Opportunity/Affirmative Action Employer

POSITIONS OPEN

NEUROBIOLOGIST

The Merck, Sharp and Dohme Research Laboratories in Rahway, New Jersey, are looking for an outstanding electrophysiologist to pursue studies in invertebrate neurobiology and comparative neuropharmacology. At least 2 years of postdoctoral experience and the demonstrated ability to initiate and pursue independent creative research as evidenced by publications are required.

This is an unusual career opportunity which offers a highly stimulating, interdisciplinary work environment. Publication of results is strongly encouraged. Compensation and benefit package is excellent. Applicants should send curriculum vitae and the names and addresses of three references to: **Technical Employee Supervisor.**

MERCK & CO., INC.

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

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MARINE BOTANIST, HALOPHYTES

The College of Marine Studies, University of Delaware, is seeking a candidate for a full-time, tenure-track faculty as a marine botanist. A joint appointment is possible with appropriate academic units. The Ph.D. is required. Rank and salary are negotiable. Teaching will be primarily at the graduate level with supervision of graduate student research. Research will emphasize work on the coastal halophytic angiosperms. The successful applicant will initially participate as co-investigator in an ongoing halophytic program with the potential to become principal investigator. The applicant will be expected to generate funds to support research ideas in addition to funding now available. Location will be Lewes, Delaware, at the university's Marine Studies Complex. Deadline for receiving applications: 30 June 1978. Send curriculum vitae and names of three references to:

Dr. Franklin C. Daiber
College of Marine Studies
University of Delaware
Newark, Delaware 19711

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

MARINE RESEARCH ASSOCIATE II. Biologist with Ph.D. in marine biology will monitor zooplankton ecology research in estuarine microcosms stressed by low level chronic pollutants. Experience required; starting salary \$13,068 to \$14,829. Submit résumé by 23 June 1978, to: **Dr. Candace Oviatt, Marine Ecosystems Research Laboratory (MERL), Graduate School of Oceanography, University of Rhode Island, Kingston, R.I. 02881.** Affirmative Action/Equal Opportunity Employer.

NEUROPHYSIOLOGIST

Applications are invited for the appointment of a neurophysiologist at the rank of assistant professor in the Department of Physiology. Send applications, with curriculum vitae and names of three referees, to: **Sandra Knowles, Department of Physiology, McGill University, 3655 Drummond Street, Montreal, Quebec, Canada H3G 1Y6.**

PHYSIOLOGIST at the level of instructor or assistant professor to engage in teaching and in collaborative research in the following areas: control of ADH release, ADH metabolism, and role of ADH in hypertension. Applicants must have Ph.D. degree. At the instructor level, no postdoctoral experience is required; 1 or 2 years of postdoctoral experience is required at the assistant professor level. Send curriculum vitae and three letters of recommendation to: **Dr. Leonard Share, Professor and Chairman, Department of Physiology and Biophysics, University of Tennessee Center for the Health Sciences (UTCHS), 894 Union Avenue (NA 426), Memphis, Tennessee 38163.** UTCHS is an Equal Opportunity/Affirmative Action Employer.

POSITIONS OPEN

BAYLOR COLLEGE OF MEDICINE MOLECULAR VIROLOGIST

The Department of Cell Biology at Baylor College of Medicine, a large multidisciplinary department, has a position available for an independent investigator interested in studying the regulation of viral gene expression in animal cells. Preference will be given to individuals with prior training in molecular biology, cell culture, and/or perhaps with ancillary experience in electron microscopy who are involved in studying viral RNA processing. This appointment will be at a faculty level commensurate with experience and qualifications. Please send résumé and names of three references to: **Dr. Jeffrey Rosen, Committee Chairman, Department of Cell Biology, Baylor College of Medicine, 6720 Bertner Drive, St. Luke's Tower, 25th Floor, Houston, Texas 77030.** Affirmative Action/Equal Opportunity Employer.

We are looking for an **NMR ENGINEER** with at least 3 years of practical experience. Applicant should be knowledgeable in operating, modifying, and maintaining variety of Bruker and Varian spectrometers with regular and superconducting magnets and Fourier transform and correlation techniques. Person should be familiar with programming in general and be proficient in programming mini computers. Prefer, minimally, someone with an M.S. in physics, but with either the practical experience of an electrical engineer or B.S. in electrical engineering. Salary open and depending upon qualifications. Write to:

Dr. R. Walter, Chairperson, NMR Users Committee
or
Dr. D. Fiat, Acting Director of the NMR Laboratory
University of Illinois at the Medical Center
P.O. Box 6998
Chicago, Illinois 60680

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

POSTDOCTORAL FELLOW interested in carcinogenesis, nuclear proteins, gene expression. Strong background in chemistry desirable. Please send résumé and references to: **L. Luckhardt, Personnel Department, Sloan-Kettering Institute for Cancer Research, 145 Boston Post Road, Rye, New York 10580.**

POSTDOCTORAL POSITION. Conformational attributes of proteins and synthetic model systems studied by kinetic, spectroscopic, and other methods. Requires background in biophysical chemistry and/or peptide synthetic chemistry. Available 1 August 1978. Salary: \$11,000 to \$13,000. Send curriculum vitae and three letters of recommendation to: **Dr. Henry E. Auer, Department of Biochemistry, University of Rochester School of Medicine, Rochester, N.Y. 14642.**

POSITIONS OPEN

POSITION available to teach and conduct research on toxicological problems related to animal production. Applicants must have a Ph.D. degree, course work in toxicology, and such related fields as organic chemistry, biochemistry, or microbiology, and a strong interest in animal science. Rank will be at the assistant professor level and salary will be commensurate with training and experience. Applicants should submit curriculum vitae and three letters of reference to: **Dr. D. E. Becker, Department of Animal Science, University of Illinois, Urbana, Illinois 61801.** An Affirmative Action/Equal Opportunity Employer.

POSTDOCTORAL POSITION. Hawaii Institute of Geophysics, University of Hawaii. **MASS SPECTROMETRIST/GEOCHEMIST.** One year, renewable. Research involving isotope-dilution analyses for lithophile (including rare-earth) element abundances and isotopic composition analyses of terrestrial and extraterrestrial rocks and minerals. Ability to operate and maintain solid-source (NBS) mass spectrometers necessary. Familiarity with igneous petrology, geochemistry, isotope geology expected. Data reduction experience desirable. \$16,000 per year. Send résumé, publication list, brief statement of research interests, and names of three references to: **Dr. John Philpotts, Hawaii Institute of Geophysics, 2525 Correa Road, Honolulu, Hawaii 96822.**

TWO POSTDOCTORAL POSITIONS available in September.

- 1) Experience or interest in renal physiology and membrane transport. Requires ability to perform analytical techniques and to work with animals in vivo.
- 2) Experience in cardiovascular-renal physiology with ability to perform analytical techniques and to apply cardiovascular measurements in vivo.

Send curriculum vitae and request that letters of recommendation be sent by two persons familiar with your recent activities to: **Dr. Barbara Rennick, Department of Pharmacology, State University of New York Medical School, 127 Farber Hall, Buffalo, N.Y. 14214.**

An Equal Opportunity/Affirmative Action Employer

POSTDOCTORAL POSITION IN PHARMACOLOGY. Position available to study hormone regulation of isolated gastric parietal cells with emphasis on polypeptide and neurotransmitter receptor analysis and cyclic nucleotide metabolism. Send résumé and names of three references to: **Dr. Gary C. Rosenfeld and Dr. W. Joseph Thompson, Department of Pharmacology, University of Texas Medical School, P.O. Box 20708, Houston, Texas 77025.** An Equal Opportunity Employer.

POSTDOCTORAL POSITION IN PHYSIOLOGY. Available immediately to study neurochemistry/neurophysiology of chemoreception and neurotransmitter action in mammalian carotid body. Experience with neurochemical, electrophysiological, and histological techniques preferred. Stipend negotiable. Send curriculum vitae and names of three references to: **Dr. S. J. Fidone, Department of Physiology, University of Utah College of Medicine, Salt Lake City, Utah 84108.** An Equal Opportunity/Affirmative Action Employer.

POSTDOCTORAL POSITION IN PLANT BIOCHEMISTRY. Available immediately for work on tobacco RuBP carboxylase/oxygenase and other soluble leaf proteins. \$10,000 to \$12,000 per year, renewable for 2 years. Prefer some experience with protein purification and chemical modification. Send curriculum vitae and names of three references to: **Dr. S. D. Kung, Department of Biological Sciences, University of Maryland Baltimore County, Catonsville, Md. 21228.** Affirmative Action/Equal Opportunity Employer.

POSTDOCTORAL POSITION IN AQUATIC ECOLOGY

Research associate position available beginning 1 September 1978, duration of 1 to 2½ years. Research area: trophic ecology and population dynamics of rotifers. Experience with radiotracer techniques, electronic particle counting, ethology, or micro-cinematography desirable. Send curriculum vitae and names of two references to: **Dr. John J. Gilbert, Department of Biological Sciences, Dartmouth College, Hanover, New Hampshire 03755.** Dartmouth College is an Equal Opportunity/Affirmative Action Employer.

UNIVERSITY OF OTAGO

**Wellington Cancer and Medical
Research Institute
Wellington Clinical School of Medicine
Wellington, New Zealand**

RESEARCH OFFICER (CANCER)— Medical or Non Medical

Applications are invited for the position of Research Officer in the Wellington Cancer and Medical Research Institute.

The successful appointee must show evidence of capacity for original work in the general field of cancer. Science graduates should possess a higher qualification, such as Ph.D. and medical graduates should also have an equivalent higher qualification. Commencing salary, according to qualifications and experience within the scale, (Science) NZ\$13,139—\$23,302, (Medical) NZ\$10,585—\$16,546 per annum.

The appointee will work under the Directorship of Professor W. E. Stehbens. The position is for three years with the possibility of an extension thereafter.

Further particulars are available from the Association of Commonwealth Universities (Appts), 36 Gordon Square, London WC1H 0PF, or from the Registrar, P.O. Box 56, Dunedin, New Zealand, or from the Director of the Institute (Professor W. E. Stehbens), Wellington Clinical School, Wellington Hospital, Wellington, New Zealand.

Applications close on 15 July 1978.

Energy Residencies Available in Washington

ESCOE Engineers in Residence receive two-year appointments in Washington, D.C. Engineers in Residence are on loan from their companies or universities. Full salary and relocation expenses are paid by ESCOE.

ESCOE conducts independent and objective technical and economic assessments of various energy technology R&D programs in the U.S. Department of Energy. The results of these assessments are used to assist in the planning and management of existing and future energy technology programs supported by the Department of Energy.

Applications and nominations are being solicited for outstanding engineers presently employed in energy technology areas by U.S. corporations and universities. A minimum of eight years of energy technology experience beyond a bachelors degree in engineering (or equivalent) is required.

ESCOE is a non-profit corporation established by the five founder engineering societies (AIChE, AIME, ASME, ASCE, and IEEE). Offices are located near the Energy Technology office of the U.S. Department of Energy and the U.S. Capitol.

A professional résumé should be submitted to Dr. Richard F. Hill, Executive Manager.



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ESCOE, The Engineering Societies Commission on Energy, Inc.,
is an Equal Opportunity Employer, M/F.

SCIENTIST INHALATION TOXICITY

The Upjohn Company is seeking a scientist with previous experience in inhalation toxicity to assume the following responsibilities: plan and conduct inhalation toxicity studies with animals; conduct and coordinate industrial toxicology program to screen for potential in-house environmental hazards; and plan a new inhalation toxicity facility. Progressive research environment.

Qualifications: Ph.D. or equivalent with a minimum of 3 years of experience in inhalation toxicity or respiratory physiology.

Kalamazoo, a mid-sized Southwestern Michigan community, affords a moderate cost of living, excellent cultural-recreational options, and attractive school systems and housing. Comprehensive benefits program. Negotiable salary.

Please send résumé to:

Upjohn

Dennis Nevala
(5032-41-1)
The Upjohn Company
7171 Portage Road
Kalamazoo, Mich. 49001

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Group Leader Radiation and Photochemistry

The Chemistry Division of Argonne National Laboratory is now seeking candidates for the position of Group leader of Radiation and Photochemistry Research. This group, which consists of sixteen highly qualified researchers, and has available a unique array of experimental facilities, has been an acknowledged leader in the field of Radiation Chemistry for several decades. Current fundamental research activities include the study of fast chemical processes associated with the passage of ionizing radiation through solutions, electron tunneling, fast radical reactions, photochemistry, chemical storage of solar energy, combustion kinetics and atmospheric chemistry.

The applicant filling this position will be expected to develop new research initiatives as well as to lead on-going programs. To be considered as candidates, applicants must be recognized as leaders in their areas of research and have successfully led group research efforts. Candidates should have a strong background in physical chemistry with specific experience in one or more of the following areas: radiation chemistry, photochemistry, laser chemistry and/or fast reaction kinetics.

Persons interested in this position are encouraged to contact or submit their resumes to: Dr. John P. Unik, Associate Director, Chemistry Division, or Ronald A. Johns, Manager Employment Placement, Argonne National Laboratory, 9700 S. Cass Avenue, Argonne, IL 60439.



**ARGONNE
NATIONAL
LABORATORY**

An equal opportunity employer, m/f

U of C-AUA-USDOE

POSITIONS OPEN

POSTDOCTORAL POSITION. Available September for biochemist/molecular biologist interested in characterization and functions of tRNA and aminoacyl-tRNA ligases of oncogenic virus-transformed cells in culture. Send curriculum vitae and three letters of reference by 1 July to: **Dr. Charles Hedgcock, Department of Biochemistry, Kansas State University, Manhattan, Kansas 66506.** *Kansas State University is an Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL POSITION available immediately to study proofreading of the codon-anticodon interaction on ribosomes [*Proc. Natl. Acad. Sci. U.S.A.* 74, 198 (1977)]. Salary: \$10,000 per annum. Send résumé and two references to: **Dr. R. C. Thompson, Chemistry Department, Temple University, Philadelphia, Pa. 19122.**

POSTDOCTORAL POSITION in basic science-oriented neurochemistry research group studying mechanism of ion transport and membrane function. Research will involve various biochemical aspects of the Na, K-ATPase in intact and reconstituted systems. Contact: **Dr. P. D. Swanson, Division of Neurology, University of Washington School of Medicine, RG-20, Seattle, Wash. 98195.**

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

POSTDOCTORAL POSITION available August 1978. For research on membrane calcium transport, cyclic nucleotides and phosphoproteins of smooth muscle in relation to the etiology of hypertension. Previous experience in protein electrophoresis or radioligand binding is desirable. Please send résumé and names of references to: **Dr. Ronald A. Janis, Department of Physiology, Northwestern University Medical Center, 303 East Chicago Avenue, Chicago, Ill. 60611.** *An Affirmative Action/Equal Opportunity Employer.*

POSTDOCTORAL RESEARCH

Applicants are invited for a position in immunochemistry of human cancers. Good background in glycoprotein and glycolipid biochemistry essential. Excellent salary and benefits. Send curriculum vitae, list of publications, and references to:

**Department of Immunochemistry Research
Evanston Hospital
2650 Ridge Avenue
Evanston, Illinois 60201**
An Equal Opportunity Employer

POSTDOCTORAL RESEARCH APPOINTMENT available immediately for a Ph.D. with strong background in protein and nucleic acid biochemistry. Knowledge of protein structure, cross-linking agents and cell-free systems desirable. Research will involve investigating the protein subunit structure of the nuclear matrix and its association with HnRNA and mRNA and the chromatinic nuclear matrix interactions. Send curriculum vitae, statement of research interests, and three references to: **A. O. Pogo, M.D., Head, Laboratory of Cell Biology, The Kimball Research Institute of The New York Blood Center, New York, N.Y. 10021.** *An Equal Opportunity Employer.*

POSTDOCTORAL/RESEARCH ASSOCIATE POSITION

Available 1 September 1978 for research in the molecular biology of the mitosis to G₁ transition in synchronized HeLa and adeno 2 transformed mammalian cells. Studies include survival of mRNA, reinitiation of RNA synthesis, and reassembly of the nucleus. Salary range: \$10,000 to \$14,000 annually for a 2-year position. Please send curriculum vitae and names of three references to: **Dr. L. D. Hodge, Department of Cell and Molecular Biology, Georgia Medical College, Augusta, Georgia 30901.**

POSTDOCTORAL RESEARCH POSITION

Available immediately for M.D./Ph.D. investigating behavioral and metabolic aspects of human food and water intake regulation. Strong interest and/or background in intermediary metabolism, catecholamine metabolism, neuropharmacology, and/or neuroendocrinology is desirable. Send curriculum vitae and references to: **Dr. Robert G. Campbell, University of Rochester, School of Medicine, Monroe Community Hospital, Rochester, New York 14603; telephone: 716-473-4080, extension 368.**

POSITIONS OPEN

POSTDOCTORAL, RESEARCH ASSOCIATE, INSTRUCTOR, ASSISTANT PROFESSOR

The Laboratory for Experimental Oncology invites applications for positions for research in metabolic regulation, control of pyrimidine enzymology, and enzyme purification in normal neoplastic tissues. Applicants with Ph.D. or M.D. degrees who have demonstrated productivity and a commitment to collaborative research programs targeted to an understanding of molecular biology and drug resistance in normal and neoplastic cells should send curriculum vitae, transcripts, reprints, and names of three references by 1 July 1978 to: **Dr. George Weber, Professor and Director, Laboratory for Experimental Oncology, Indiana University School of Medicine, 1100 West Michigan Street, Indianapolis, Indiana 46202.**

Indiana University is an Equal Opportunity/Affirmative Action Employer.

The AUSTRALIAN NATIONAL UNIVERSITY, Canberra, invites applications for the post of **PROFESSORIAL FELLOW** in geomorphology in the Research School of Pacific Studies. The post was vacated by Dr. J. N. Jennings on his retirement. Applicants should have wide interest in geomorphology and exceptional expertise in some aspect of it. Appointment is immediately to retiring age (65 years). Salary currently: Australian \$29,153 per annum; current exchange rates A\$1 : UK 62NP, U.S.\$1.13. Reasonable travel expenses. Superannuation benefits. Further information from: **Academic Registrar, P.O. Box 4, Canberra ACT, 2600, Australia,** with whom applications close 1 August 1978.

UNIVERSITY OF CALIFORNIA, IRVINE CALIFORNIA COLLEGE OF MEDICINE DEPARTMENT OF RADIOLOGICAL SCIENCES

Applications are invited for the position of **PROFESSOR AND CHIEF** of the **DIVISION OF RADIO-PHARMACY** in the Department of Radiological Sciences (Nuclear Medicine Division) at the University of California, Irvine, California College of Medicine. The successful candidate must be a clearly outstanding figure in the field of radiopharmacy. Requirements for this position include a Ph.D. degree in a field related to radiopharmacy, a minimum of 10 years of experience in academic nuclear medicine, and evidence of a considerable body of original research work in the development and application of radiodiagnostic agents in nuclear medicine. The new chief will be expected to develop a vigorous research program at the University of California, Irvine, to participate in the Graduate Program in Radiological Sciences, to teach residents and medical students, and to assume responsibility for the clinical aspects of the radiopharmaceutical program at the University of California, Irvine, Medical Center. *Applications are invited from all qualified candidates; women and minority candidates are encouraged to apply.* Applications, including a biography and copies of any publications, should be sent to:

**Eric N. C. Milne, M.B., Ch.B., F.R.C.R.
Professor and Chairman
Department of Radiological Sciences
University of California, Irvine
College of Medicine
Irvine, California 92717**

Closing date: 12 July 1978.

UNIVERSITY OF MICHIGAN MEDICAL SCHOOL DEPARTMENT OF PEDIATRICS

Position available for **PROFESSOR—PEDIATRIC NEUROLOGY**. Requirements: Board-certified or Board-eligible in pediatrics and Board-certified or Board-eligible in pediatric neurology. Patient care, teaching, and research. Code 1000FO. Reply to: **Box 213, SCIENCE. A nondiscriminatory, Affirmative Action Employer.**

RESEARCH ASSISTANT/ASSOCIATE PROFESSOR: Director, Core Cytohistochemistry Facility, University of Washington Diabetes Endocrine Research Center. Supervise morphology laboratory providing immunocytochemistry, autoradiography, routine histologic stains, and cell identification at light and EM level. Develop new morphologic techniques relevant to endocrine and diabetes. Ph.D. in morphologically related biological science with immunocytochemistry procedures. Send résumé and four letters of recommendation to: **Dr. D. Porte, Jr., Diabetes Research Center, ZB-34, University of Washington, Seattle, Wash. 98195.** *The University of Washington is an Affirmative Action/Equal Opportunity Employer.*

POSITIONS OPEN

RESEARCH ASSOCIATE position for a specialist in radio astronomy **INTERFEROMETRY** is available at the National Astronomy and Ionosphere Center's Arecibo Observatory, located near Arecibo, Puerto Rico. Principal activity will be to develop and use a two-element interferometer system at Arecibo. Will also be responsible for assisting visiting scientists associated with VLBI or other interferometry observational programs. Round-trip air transportation between the observatory and the home institution will be provided for the research associate and immediate family, as well as moving expenses and a dislocation allowance. Appointment will be for 1 year, with a second year possible by mutual agreement. Pending successful review prior to end of second year, research associate will be appointed for a 3-year period. Salary is open. Position available immediately. Send letter of application, curriculum vitae, and names of at least two individuals for references to:

**Professor F. D. Drake, Director
National Astronomy and Ionosphere Center
Cornell University
Ithaca, New York 14853**

The National Astronomy and Ionosphere Center is operated by Cornell University under contract with the National Science Foundation. Cornell University is an Equal Opportunity Employer.

RESEARCH ASSOCIATE position for a radio astronomer experienced in **PULSAR** observations is available at the National Astronomy and Ionosphere Center's Arecibo Observatory, located near Arecibo, Puerto Rico. Research associate will carry out research utilizing any of the facilities of the Arecibo Observatory, in accordance with the standard NAIC research proposal approval policies. In addition, research associate will be responsible for assisting visiting scientists conducting pulsar observations. Round-trip air transportation between the observatory and the home institution will be provided for the research associate and immediate family, as well as moving expenses and a dislocation allowance. Appointment will be for 1 year, with a second year possible by mutual agreement. Salary is open. Position available immediately. Send letter of application, curriculum vitae, and names of at least two references to:

**Professor F. D. Drake, Director
National Astronomy and Ionosphere Center
Cornell University
Ithaca, New York 14853**

The National Astronomy and Ionosphere Center is operated by Cornell University under contract with the National Science Foundation. Cornell University is an Equal Opportunity Employer.

RESEARCH POSITIONS

Postdoctoral positions are available at the California College of Medicine, in the Departments of Medicine and Psychiatry and Human Behavior; at the School of Biological Sciences, in the Departments of Molecular Biology and Biochemistry and Psychobiology; and at the School of Social Sciences in the recently funded Alcohol Research Center at the University of California, Irvine. The faculty involved and areas of research are as follows: S. Tewari, Ph.D., and P. F. Hall, M.D., Ph.D.—effects of ethanol on cerebral protein synthesis with experience in neurochemistry/neuroanatomy/neurophysiology/and biochemistry; effects of alcohol on testicular function; biochemistry and neuroanatomy background required with electron microscopy experience. K. K. Tewari, Ph.D.—on the transcription of cerebral DNA with a background in biochemistry of nucleic acids and neurophysiology. R. F. Thompson, Ph.D.—brain mechanisms of learning; neurophysiology/neuroanatomy/behavioral background desired. N. M. Weinberger, Ph.D.—neurophysiology of learning and ethanol action; electrophysiology or behavioral conditioning background preferred. C. S. McLaughlin, Ph.D.—RNA and protein synthesis in eukaryotes; a background in biochemistry and molecular biology. E. K. Wagner, Ph.D.—course of HSV infection in vivo and in vitro with a background in animal cell culture, animal virus techniques, and biochemistry. E. M. Pattison, M.D.—social systems and alcoholism; social science and psychological science background with expertise in social network theory and analysis.

All qualified candidates welcome; minorities and women encouraged to apply.

For further information contact individual faculty members in their areas of expertise through: **Dr. S. Tewari, Science Director, Alcohol Research Center, Department of Psychiatry and Human Behavior, University of California, Irvine, California 92717.**

physiologist

Travenol Laboratories, Inc., a leading international manufacturer in the medical care industry, has an immediate need for a Scientist. Your primary responsibilities will lie in the research and development of a product line aimed at the blood bank market.

The ideal candidate should possess a Doctorate in cell physiology with a strong background in physical-biochemistry. Research experience in the area of cell membranes would be helpful. The candidate should be capable of independent investigation and strongly motivated to contribute to the development of our product line.

We offer an excellent salary as well as a comprehensive benefit package. For immediate consideration, please send a confidential resume with salary history to:

Dept. JU-29M



P. O. Box 490
Round Lake, IL 60073

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DIRECTOR COMMUNICATIVE DISORDERS PROGRAM

The National Institute of Neurological and Communicative Disorders and Stroke, National Institutes of Health, Public Health Service, invites nominations and applications for their position of Director, Communicative Disorders Program. The Communicative Disorders Program is responsible for the planning and operation of a national research effort in the areas of diseases of the ear, nose and throat, deafness, language disorders, and speech disorders. Candidates must possess a doctoral level degree (M.D. or Ph.D.) or equivalent training in a relevant scientific discipline and 3 to 5 years of related experience. In addition, candidates must have evidence of substantial and scholarly achievement and professional stature and demonstrated the ability to implement equal employment opportunity objectives. It is desirable that candidates have had both research and clinical experience, have demonstrated the ability to lead a nationally based health research program, training and education beyond the doctoral level, and awards and participation in pertinent outside activities. Candidates will be evaluated by a panel on the degree to which they possess these desirable qualifications.

The position may be filled in either the career Civil Service (subject to the approval of the U.S. Civil Service Commission) or the Commissioned Corps of the Public Health Service with a salary range between \$36,000 and \$47,500 per annum. Salary is negotiable depending on length and breadth of experience.

Letters of interest, curriculum vitae, bibliography, SF-171 (Personal Qualifications Statement) and evaluations of performance which speaks to the qualifications for this position should be sent by August 1, 1978, to: Dr. Eldon L. Eagles, Deputy Director, NINCDS, 9000 Rockville Pike, Bldg. 31, Room 8A-52, Bethesda, Maryland 20014. An Equal Opportunity Employer.

NATIONAL INSTITUTES OF HEALTH

Harvard University

School of Public Health

John F. Kennedy
School of Government

EXECUTIVE PROGRAM in ENVIRONMENTAL POLICY and MANAGEMENT

OCTOBER 15 —
NOVEMBER 3, 1978

For Senior Environmental
Policy Makers and Managers

For further information, contact:
Administrative Director
Program in Environmental Policy and Management
Executive Programs in Health Policy and Management
Harvard School of Public Health
677 Huntington Avenue
Boston, MA 02115
(617) 732-1101

As a matter of policy, Harvard University does not discriminate on the basis of race, sex or handicap. Executive Programs strongly encourages applications from minorities and women.

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POSITIONS OPEN

PHYSIOLOGISTS

Applications are invited for positions at the assistant and associate professor level in the Department of Physiology at Tufts University School of Medicine. Duties include research and the teaching of medical, dental, veterinary, and postgraduate students. All areas of physiology are being considered during the current expansion of the department, although preferred interests are in the control of ion transport, secretory processes, membrane function, and in diabetes-related areas. Applications, with curriculum vitae, publication list, and three letters of recommendation should be sent to: **Dr. Geoffrey W. G. Sharp, Chairman, Department of Physiology, Tufts University Medical School, Boston, Massachusetts 02111.**

RESEARCH ASSOCIATE—PEDIATRICS. Ph.D. in biochemistry or equivalent. Competence in enzymological techniques essential. Experience in neurochemistry or cancer research advantageous. Please send résumé, with salary requirements, to: **Personnel Department, THE MOUNT SINAI MEDICAL CENTER, 19 East 98 Street, New York, N.Y. 10029. An Equal Opportunity Employer.**

SECTION HEAD INTERNATIONAL DECADE OF OCEAN EXPLORATION

The National Science Foundation's Division of Ocean Sciences is seeking qualified applicants for head of the International Decade of Ocean Exploration Section. This position is excepted from the competitive civil service, is equivalent to a GS-16 position (\$42,423 to \$47,500); and involves an initial 2-year rotational appointment. Applicants should have a Ph.D. in oceanography or a closely related field and/or equivalent research and experience in the administration of large, multi-disciplinary research programs. A broad general knowledge of marine science research; familiarity with the U.S. oceanographic community; and administrative experience are also required. Applicants should submit a statement of interest and résumé on Standard Form 171, Personal Qualifications Statement, to: **Division of Personnel and Management, Attention: Section B, Room 212, 1800 G Street NW, Washington, D.C. 20550. Telephone: 202-632-4107. Closing date: 1 August 1978. The National Science Foundation is an Equal Opportunity Employer.**

STAFF ASSOCIATE. Applicants are requested for this position in the Department of Medicine, College of Physicians and Surgeons, Columbia University. The position is for full-time research in endocrinology. The applicant should have an A.B. degree with 7 years of laboratory experience. Submit curriculum vitae and references to: **Elaine Stein, Columbia University, College of Physicians and Surgeons, 630 West 168 Street, New York, N.Y. 10032. Columbia University is an Equal Opportunity/Affirmative Action Employer.**

The Earth Science Program (undergraduate) at the University of Wisconsin-Parkside invites applications for a **TEMPORARY 9-MONTH POSITION** (beginning September 1978) at the assistant or associate professor level to teach mineralogy, petrology, an introductory course, and one or more courses in the particular specialty areas of the successful applicant. This position is a leave of absence replacement and requires a person with a completed Ph.D. The position is ideal for a person who is interested in the Precambrian geology of the Great Lakes area. *Parkside is an Equal Opportunity/Affirmative Action Employer.* Forward résumé and at least three letters of recommendation by 1 July to: **Professor Eugene I. Smith, University of Wisconsin-Parkside, Kenosha, Wisconsin 53141.**

VIROLOGY (ASSISTANT SPECIALIST) position available in the Department of Plant Pathology for work in the area of comparative plant-insect virology. Applicant should have an M.S. or equivalent experience in an appropriate field with competence in physiochemical characterization of viruses and familiarity with serological techniques. The position is for 2 years and is immediately available. Salary will be commensurate with experience. Send résumé and names of references to: **Professor D. E. Schlegel, Department of Plant Pathology, 147 Hilgard Hall, University of California, Berkeley, Calif. 94720 by 1 July 1978.**

University of California is an Affirmative Action Employer.

POSITIONS OPEN

SCIENTIST BIOCHEMISTRY/IMMUNOLOGY

Applications are invited for a staff scientist position beginning July 1978. The position involves independent research in a biochemically oriented group studying differentiation of the immune system and leukemia in mice. Desirable areas of interest include enzymatic markers of early T cell differentiation, function of thymic hormones in differentiation and leukemia, and differentiation of immunologically specific lymphocytes in response to RNA sarcoma virus infection. Ph.D. required, with 2 to 3 years of postdoctoral experience in biochemistry and/or immunology.

Send curriculum vitae and names of three references to:

**Dr. James N. Ihle
Cancer Biology Program
Frederick Cancer Research Center
P.O. Box B
Frederick, Md. 21701**

The Henry Francis Du Pont Winterthur Museum seeks to fill the position of **WOOD RESEARCHER/WOOD IDENTIFICATION SPECIALIST.** Candidates should have at least the master's degree and a strong background in wood anatomy, preferably with some research experience and training in microscopy, botanical histological methods, and photomicrography. Applicants should have experience in the methods and practice of wood identification and in the curation of wood collections.

The successful candidate will have responsibility for routine identification of woods used in fabrication of wooden objects of antiquity and will also be required to carry out independent research leading to refined methods for discriminating among different kinds of wood and to pursue investigations of wood, wood structure, and wood chemistry as these pertain to identification.

Interested candidates should send their detailed résumés, including transcripts of college and university courses, to: **Dr. George J. Reilly, Museum Scientist and Conservation Coordinator, The Henry Francis Du Pont Winterthur Museum, Winterthur, Delaware 19735.** Arrangements should also be made by candidates for at least three letters of recommendation to be sent to Dr. Reilly. Salary and other perquisites are competitive with those for similar types of professional positions.

CALL FOR SUPPORT

New **SCIENTISTS' CENTER FOR ANIMAL WELFARE** seeks intellectual and financial support to improve animal welfare, reduce unnecessary suffering, conduct education and research on extinction of species, cruelty to wildlife, animal husbandry, and animal experimentation. Bylaws and brochure available. To obtain further information, to become a Sponsor, an appointed Correspondent, or elected Fellow, or to make donation, write: **Scientists' Center for Animal Welfare, Box 3755, Washington, D.C. 20007.** See also: POSITIONS OPEN, p. 1192, column 2.

COURSES

SYMPOSIUM ON CELL SUBSTRATES AND THEIR USE

The Second Annual W. Alton Jones Cell Science Center Symposium will be concerned with cell substrates and their use in the production of vaccines and other biologicals and will be held 23 to 26 October 1978, at the W. Alton Jones Cell Science Center, Lake Placid, New York.

Over 20 eminent scientists will lead the symposium with a review of past experience and the future directions for the use of cells in the production of various types of biologicals. The scope of the conference will include presentations and discussions of cell substrates as used in the production of virus vaccines and biochemicals such as interferon as well as more experimental or potential uses of cells such as in cell transplantation. A session on benefit/risk considerations is also scheduled. Each evening there will be one major presentation by a leading authority.

The cost of \$250 includes registration fee, hotel accommodation, and meals for the duration of the workshop. For application forms and details contact:

**Course Secretary, SW78-2S
W. Alton Jones Cell Science Center
Old Barn Road
Lake Placid, New York 12946**

SYMPOSIUM

LAS CRUCES CONFERENCE ON METHODS FOR DETERMINING METAL ION ENVIRONMENTS IN PROTEINS

10 to 12 January 1979

**HOLIDAY INN DE LAS CRUCES
LAS CRUCES, NEW MEXICO
THE PRINCIPLES AND TECHNIQUES
FOR PROBING THE METAL SITE IN
PROTEINS WILL BE PRESENTED**

**Absorption Spectroscopy (H. B. Gray)
CD and Fluorescence (B. L. Vallee)
ESR (G. Palmer)
IR (W. S. Caughey)
Kinetic (G. G. Hammes)
NMR—Relaxation (A. S. Mildvan)
NMR—High Resolution (B. D. Sykes)
Raman (D. F. Shriver)
Structural (W. N. Lipscomb)
X-ray Absorption (R. G. Shulman)**

As well as the formal presentations, there will be informal discussion groups and poster presentations on all aspects of metalloprotein chemistry.

Persons interested in attending the conference or presenting papers should contact the organizers: **D. W. Darnall and R. G. Wilkins, Department of Chemistry, New Mexico State University, Las Cruces, N.M. 88003.**

Further details and application forms will be available in July.

TRAINEESHIPS

TWO POSTDOCTORAL TRAINEESHIPS are available in biochemistry at the University of California, Los Angeles (UCLA), Mental Retardation Research Center through an award from USPHS. Studies focus on various aspects of inborn errors of metabolism and metabolism of ketone bodies. Apply to: **Dr. G. Popjak, Mental Retardation Research Center, 760 Westwood Plaza, UCLA School of Medicine, Los Angeles, California 90024. An Equal Opportunity Employer.**

FELLOWSHIPS

POSTDOCTORAL RESEARCH FELLOWSHIP in experimental ophthalmic pathology available July 1978 at Jules Stein Eye Institute, University of California, Los Angeles (UCLA). This 2-year fellowship is sponsored by NIH. Applicant must have prior training in immunology. Must be U.S. citizen. Send résumé and three references to: **Alan L. Shabo, M.D., Jules Stein Eye Institute, UCLA School of Medicine, Los Angeles, Calif. 90024. An Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL FELLOWSHIP in clinical pharmacology, NIH funding. Ph.D. or Ph.D. with interest in cardiovascular pharmacology of drug metabolism. Contact: **John L. McNay, M.D., Professor of Medicine and Pharmacology, Director, Clinical Pharmacology Program, The University of Texas Health Center at San Antonio, Department of Pharmacology, 7703 Floyd Curl Drive, San Antonio, Texas 78284. An Equal Opportunity/Affirmative Action Employer.**

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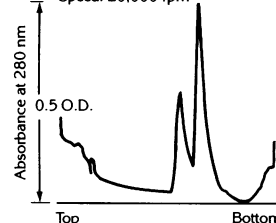
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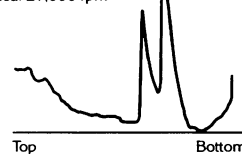


Separation of Cowpea Mosaic Virus Particles (Yellow Strain)

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Timer Setting: 4 Hours
Speed: 20,000 rpm



Ultracentrifuge (OTD-65)
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*U.S. Patent 3,998,383

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Arrows at left indicate problem of reciprocity failure. □ Arrows at right illustrate how compensation for reciprocity factor assures equal light intensity penetration throughout film emulsion layers.

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