

purpose may have been fulfilled at the workshop itself, most of the contributions in the book are authored by oceanographers.

Be that as it may, the contributions are uniformly well written, informative, and current. Physiological topics treated include photosynthesis, respiration, cell division, and nutrient assimilation. There is also a series of reviews on physiological behavior as applied to multispecies communities, as well as discussions of compartmental analysis and cell morphology. The chapters by J. A. Raven and J. Beardall, B. B. Prézélin, and P. J. Syrett I found especially enlightening, and in these the stated purpose of the workshop is illustrated best. Raven and Beardall, dealing with respiration and photorespiration, use the theme of cellular economics: running costs, efficiencies, and survival. The wealth of physiological detail is thus put in an ecologically useful context, and the reader never loses sight of the larger intent of the discussion. Prézélin ("Light reactions in photosynthesis") suggests promising techniques for field use borrowed from laboratory studies of photosynthesis and pigment systems. Syrett presents a lucid discussion of nitrogen metabolism and concludes by noting the relative success with which features of nitrogen metabolism discovered in the laboratory have been used to explain ecological observations.

I note less self-assurance among those authors whose physiological measurements are used with natural populations. All appear to be attempting to come to terms with the effects of environmental variability on physiological behavior. My own feeling is that the problem will require experimental designs unconstrained by classical laboratory approaches. At the same time, I fully agree with R. W. Eppley, who, in his cogent review of phytoplankton growth rates and nutrient assimilation, suggests independent (physical and chemical oceanographic) means by which estimates of primary production based on physiological processes can be verified.

Physiological Bases of Phytoplankton Ecology is an important book. Certainly it is required reading for practitioners. The reviews of the progress and the recognition of the limitations of algal physiology as applied to oceanographic studies (and, I might add, the modest price) also make it worthwhile in educating future oceanographers.

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19 NOVEMBER 1982

Bacteria

The Prokaryotes. A Handbook on Habitats, Isolation, and Identification of Bacteria. MORTIMER P. STARR, HEINZ STOLP, HANS G. TRÜPER, ALBERT BALOWS, and HANS G. SCHLEGEL, Eds. Springer-Verlag, New York, 1981. In two volumes. I, 2284 pp., illus., + plates + index. \$380.

This comprehensive "handbook" is more than its subtitle implies. Besides summarizing available information on "habitats, isolation, and identification of bacteria," it attempts to provide an overview of the general biology of essentially all genera formally described in the last (eighth) edition of *Bergey's Manual of Determinative Bacteriology* plus additional newly proposed ones. The book generally follows the taxonomic groupings and sequence of *Bergey's Manual*. The 169 chapters that make up this two-volume set are the products of some 180 authors who, on the basis of their own research experiences, are among those best qualified to deal with the allotted groups. The handbook is, then, authoritative. Although other experts may be annoyed by sins of omission or presentation, the novice can have confidence in the accuracy of the data presented.

The descriptive material and the encyclopedic nature of the book make it unsurpassed as a general reference to the less well known groups of bacteria and the literature pertinent thereto. The individual groups are not covered in depth, and the book has little to offer the expert in his or her own field. However, it will usually provide the neophyte with a good general introduction to a particular organism and with a starting point for attempts at isolation, cultivation, and identification. The book is not uniformly successful in these respects. By way of example, seven pages are allotted to *Escherichia coli*, including two pages of tables and one of references, which obviously cannot provide even a minimal introduction to its biology. The value of the entire section on the Enterobacteriaceae and perhaps of other major sections would have been greatly enhanced by the addition of an introductory chapter, similar to the one introducing the phototrophic prokaryotes, describing the structure, physiology, and metabolism of the group as a whole.

As an example at the other extreme, the nine pages devoted to the family (sic) Pelonemataceae, including some four pages of tables of totally trivial information, are more than adequate to underscore our lack of knowledge of this group of very dubious taxonomic validity.

More important than the waste of space, the retention of formal taxonomic nomenclature for groups above the genus rank in the example above and elsewhere in the handbook is bad science and should have been eliminated. This is particularly so for groups of uncultured organisms known only by distinctive, and conceivably aberrant, morphologies. Increasingly over the last decade or so powerful tools have been developed and applied to the study of bacterial phylogeny. The taxonomic results of these studies are well presented in such chapters as "Introduction to the family Enterobacteriaceae" or "The methanogenic bacteria." It is regrettable that an introductory chapter specifically concerned with bacterial phylogeny, progress, and pitfalls was not included. Another obvious lack is that of a critical discussion of the enrichment culture technique—principle, practices, and limitations. A significant percentage of the book is devoted to assorted applications of this methodology, and a critical discussion of it in the introductory section would have been worthwhile.

Overall, the two volumes represent a monumental undertaking very successfully done. The wealth of information contained should insure the inclusion of the book in the libraries of all organizations dealing extensively with bacteria. Considering its high price, its vast scope, and its large complement of inherently dull material, such as media recipes and undigestible tables, individual purchasers may well be limited to those who enjoy browsing through the *Book of Knowledge* or the *Encyclopaedia Britannica* as I do.

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Artificial Particle Beams in Space Plasma Studies. Proceedings of an institute, Geilo, Norway, Apr. (Continued on page 816)

Limiting Diameters of Pores and the Surface Structure of Plant Cell Walls

Tepfer and Taylor (1) claimed that our earlier estimates (2) of the limiting pore size of plant cell walls were substantially in error. I will demonstrate that the experimental results that Tepfer and Taylor used to make their claim were not feasible and will resolve the controversy that they believe exists.

We used a solute exclusion technique to determine the size of the pores in the walls of plant cells that allow molecules to freely penetrate the wall; we estimated that these pores were about 40 Å and suggested that molecules larger than this would have difficulty passing through the walls of living plant cells (2). Tepfer and Taylor (1) constructed a gel permeation column from cell walls of homogenized bean hypocotyls and found that proteins larger than those we would predict to pass through a cell wall did permeate a sizable portion of the wall matrix. Although they stated that such a gel permeation column could not determine the diameters of pores which allow molecules to pass completely through a cell wall, they did suggest that wall shrinkage in hypertonic solutions reduces the pore size artifactually, and that in turgid cells ovalbumin, a molecule with a diameter much larger than 40 Å, would penetrate the cell wall of a living cell. They reported that epidermal cells of oat roots shrank but did not plasmolyze in solutions of 0.2M sucrose, whereas 0.3M sucrose caused plasmolysis. They reasoned that for cells placed in 0.2M sucrose plus 5 percent ovalbumin, the sucrose would supply most of the osmotic potential required for plasmolysis, and the ovalbumin would cause little osmotic shrinkage. Tepfer and Taylor (1) stated that 0.2M sucrose plus 5 percent ovalbumin caused plasmolysis and concluded that "under these conditions it appears that the ovalbumin was able to penetrate the cell wall and hence cause plasmolysis."

I determined the osmotic potentials of such solutions by freezing-point-depression osmometry; the 0.2M sucrose is about -5.4 bar, and 0.3M sucrose is about -8.2 bar (Fig. 1). Observation of plasmolysis by microscopy with a 0.1M increase in external solute concentration (about 3.0 bars) is reasonable. Since the osmotic potentials among the individual root cells are heterogeneous, observation of incipient plasmolysis of a population of cells would be difficult with increases in solute concentration much less than 0.1M.

Observation of plasmolysis with 0.2M sucrose plus 5 percent ovalbumin is another matter. Plasmolysis with only 5 percent ovalbumin is very unlikely; 5 percent ovalbumin alone contributes an osmotic potential of no more than 0.3 bar, and the presence of 0.2M sucrose does not result in an interaction that increases the osmotic potential of the solution more than additively (Fig. 1). Thus, the ovalbumin can contribute no more than 10 percent of the osmotic potential needed to observe plasmolysis unequivocally.

Primarily as a result of their gel permeation chromatography, Tepfer and Taylor set out to explain the differences between their data and ours. In doing so, they interpreted our data in a manner that creates controversy when, in fact, there is none. We apparently left the impression that the plant cell wall is a homogeneous, solid matrix with capillaries no larger than 40 Å. This impression should not be construed from our data, particularly in light of the work of many investigators who have shown by purely physical techniques that, although a majority of pits of a cell wall are smaller than 40 Å, pits up to 300 Å in diameter are found (3). These investigations were

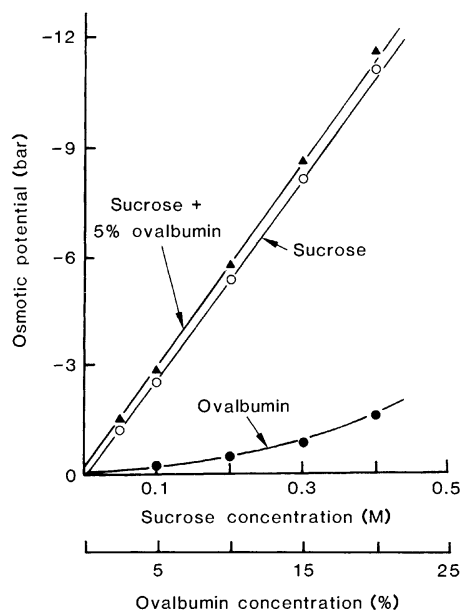


Fig. 1. Comparison of the osmotic potentials of sucrose and ovalbumin solutions. Solutions were made in deionized water, and the osmolality determined by freezing-point-depression osmometry (Advanced Instruments, Newton Highlands, Massachusetts). Osmotic potentials were then calculated for 23°C from osmolality values. (Electrophoresis grade, salt-free ovalbumin was from Sigma Chemical Company, St. Louis, Missouri).

cited in our report but were not discussed in detail since we were interested only in the limiting size of the pores that allowed molecules to pass through a wall. Even though one might argue that Tepfer and Taylor's frozen plant walls ground to a fine powder may not behave the same as the walls of a living cell, it is still not surprising that they found large proteins able to penetrate a sizable portion of their homogenized wall fragments. If the surface structure of a cell wall is crudely analogous to a plane composed of double-sided funnels, we could only determine the diameter of the necks of the funnels. The gel permeation chromatography of Tepfer and Taylor (1), on the other hand, could give some clue to the nature of the larger included space. Thus, the limiting diameters of pores approximate the total included volume of a gel permeation column and not the void volume. We would predict that proteins only up to the size of cytochrome c would approach the total included volume; this was verified in the data of Tepfer and Taylor. It is important to note that in neither report can one derive the actual amount of wall space available for diffusion or any directionality of permeation.

Tepfer and Taylor also state that when cells are placed in hypertonic solutions, water will diffuse out faster than a larger solute can diffuse in, and thus, cytorrhysis (cell collapse) should precede plasmolysis. Although true in theory, this phenomenon played little role in our estimation of the limiting pore size of the wall. As we described in our original report, cells in polyethylene glycol (PEG) 1000 or 1540 exhibited momentary cytorrhysis followed by plasmolysis (2). The time required for this plasmolysis was no more than 10 seconds. Diffusivity values for a large size range of dextrans are established (4) and were cited in our report. Such data clearly show that the diffusivity values for this range of polymers vary no more than twofold. Thus, if the PEG 1000 caused plasmolysis within 10 seconds, then PEG 4000 should cause plasmolysis within 20 seconds. Cells that excluded PEG 4000 or PEG 6000, excluded it for over an hour.

They also reason that turgid cells have larger pores than flaccid cells, and cell wall shrinkage in hypertonic solutions decreases the limiting diameter of the pores artifactually, much as a circle drawn on a balloon shrinks when the air is released. Since we know little about the surface structure of the cell wall of any living cell, however, there is no reason a priori that the pores should become smaller. Whether or not the cell

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MARTIN POPE and CHARLES E. SWENBERG, *both of New York University.* This is a comprehensive survey of current experimental and related theoretical work carried out in the field of electronic properties of aromatic hydrocarbon solids. Topics include the generation, motion, and interactions of excitons and charge carriers in typical organic solids. The book includes detailed experimental results, and addresses controversial issues. (*Monographs on the Physics and Chemistry of Materials*)
1982 781 pp.; 500 line drawings \$145.00

Molecular Theory of Capillarity

J. S. ROWLINSON, *University of Oxford,* and B. WIDOM, *Cornell University.* This book discusses the phenomenon of capillarity in terms of early mechanical models of liquids and the quasi-thermodynamical methods that replaced them, and then develops in detail the statistical mechanics of the liquid-gas surface. Statistical results are applied to artificial model systems, and realistic models are treated by computer simulation. (*International Series of Monographs on Chemistry*)
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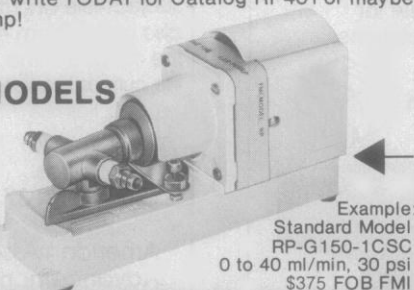
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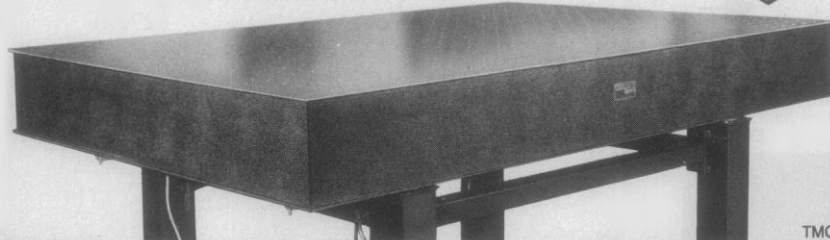
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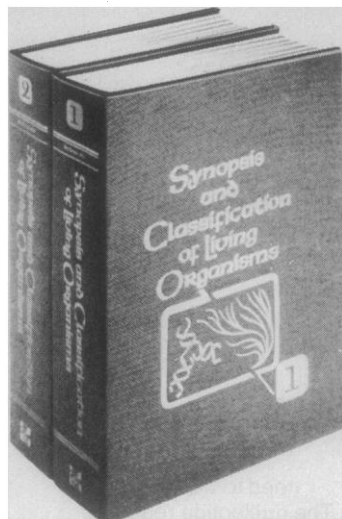
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Primary Energy. Present Status and Future Perspectives. Klaus O. Thielheim, Ed. Springer-Verlag, New York, 1982. viii, 372 pp., illus. Paper, \$34.

Reactor Noise—SMORN III. Proceedings of a meeting, Tokyo, Oct. 1981. M. M. R. Williams, Ed. Pergamon, New York, 1982. xviii, 712 pp., illus. \$140.00. Progress in Nuclear Energy, vol. 9.

Receptive Mechanisms of Sound in the Ear. Yasuji Katsuki. Cambridge University Press, New York, 1982. viii, 155 pp., illus. \$39.50.

Reminiscences and Reflections. Hans Krebs in collaboration with Anne Martin. Clarendon (Oxford University Press), New York, 1981. xvii, 298 pp. + plates. \$19.95.

Renal Ammonia Metabolism. Papers from a symposium, Athens, June 1981. R. L. Tannen, L. Goldstein, G. Lemieux, D. Simpson, and P. Vinay, Eds. Karger, Basel, 1982. x, 154 pp., illus. Paper, \$58.25. Contributions to Nephrology, vol. 31.

Renewable Resource Utilization for Development. Robert P. Morgan and Larry J. Icerman with Elizabeth S. Andrews and six others. Pergamon, New York, 1981. xxx, 394 pp. \$39.50. Pergamon Policy Studies on International Development.

Resonances in Heavy Ion Reactions. Proceedings of a symposium, Bad Honnef, Oct. 1981. K. A. Eberhard, Ed. Springer-Verlag, New York, 1982. xii, 448 pp., illus. Paper, \$28. Lecture Notes in Physics, vol. 156.

Resource Competition and Community Structure. David Tilman. Princeton University Press, Princeton, N.J., 1982. xii, 298 pp., illus. Cloth, \$27.50; paper, \$9.95. Monographs in Population Biology.

The Role of Tamoxifen in Breast Cancer. Papers from a meeting. Stefano Iacobelli, Marc E. Lippman, and Gioacchino Robustelli Della Cuna, Eds. Raven, New York, 1982. xii, 124 pp., illus. \$17.

Safety Problems Related to Sodium Handling in Liquid Metal Fast Breeder Reactors and Large Test Facilities. Papers from a meeting, Ispra, Italy, Nov. 1980. H. M. Kottowski, Ed. Harwood, New York, 1982. vi, 252 pp., illus. \$38. ISRA Courses on Nuclear Engineering and Technology.

Scattering Theory of Waves and Particles. Roger G. Newton. Springer-Verlag, New York, ed. 2, 1982. xx, 746 pp., illus. \$48. Texts and Monographs in Physics.

Schizophrenia. The Epigenetic Puzzle. Irving I. Gottesman and James Shields with the assistance of Daniel R. Hanson. Cambridge University Press, New York, 1982. xiv, 258 pp., illus. Cloth, \$32.50. Paper, \$10.95.

Science and Technology. An Introduction to the Literature. Denis Grogan. Clive Bingley, London, ed. 4, 1982 (U.S. distributor, Shoe String Press, Hamden, Conn.). 400 pp. Cloth, \$27.50; paper, \$18.50.

Science, Technology and Development. Options and Policies. Mekki Mteawa, Ed. University Press of America, Lanham, Md., 1982. xiv, 240 pp. Cloth, \$21; paper, \$11.

Science, Technology, and the Issues of the Eighties. Policy Outlook. Papers from two AAAS workshops, St. Michael's, Md., Nov. 1980, and Hilton Head, S.C., Dec. 1980. Albert H. Teich and Ray Thornton, Eds. Westview, Boulder, Colo., 1982. xiv, 290 pp. Cloth, \$25; paper, \$12. Westview Special Studies in Science, Technology, and Public Policy/Society.

The Snyder's Mounds and Five Other Mound Groups in Calhoun County, Illinois. David P. Braun, James B. Griffin, and Paul F. Titterton. University of Michigan Museum of Anthropology, Ann Arbor, 1982. xiv, 178 pp., illus. Paper, \$7.50. Technical Reports, No. 13. Research Reports in Archaeology, Contribution 8.

The Social Logic of Health. Will Wright. Rutgers University Press, New Brunswick, N.J., 1982. xvi, 216 pp. \$14.95.

Software Engineering. I. Sommerville. Addison-Wesley, Reading, Mass., 1982. x, 290 pp., illus. Paper, \$15.95. International Computer Science Series.

Software Tools in Pascal. Brian W. Kernighan and P. J. Plauger. Addison-Wesley, Reading, Mass., 1982. xii, 366 pp. Paper, \$55.

They Blew Our Weather. Frederick Clare. Exposition Press, Smithtown, N.Y., 1982. xii, 196 pp., illus. \$20.

Tidal Energy. Roger Henri Charlier. Van Nostrand Reinhold, New York, 1982. xiv, 352 pp., illus. \$28.

Topics in Molecular Pharmacology. Vol. 1. Arnold S. V. Burgen and Gordon C. K. Roberts, Eds. Elsevier/North-Holland, New York, 1981. x, 250 pp., illus. \$74.50.

U.S.-Japanese Agricultural Trade Relations. Papers from a conference, Tokyo, June 1980. Emery N. Castle and Kenzo Hemmi, Eds. Resources for the Future, Washington, D.C., 1982 (distributor, Johns Hopkins University Press, Baltimore). xx, 436 pp. Cloth, \$35.00; paper, \$14.95.

The World's Eye. Albert M. Potts. University Press of Kentucky, Lexington, 1982. viii, 94 pp., illus. \$21.50.

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ASSISTANT PROFESSORSHIP

Applications are invited for a tenure-track assistant professorship in the Department of Biochemistry and Biophysics, Iowa State University (ISU), to begin fall 1983. Duties include teaching undergraduate and graduate courses and conducting an independent research program. Research interests should be within the broad areas of biochemistry, biophysics, or molecular biology. Qualifications include a Ph.D. degree and a record of excellence and productivity in scholarly work. Résumé and three letters of reference should be sent to: **Professor Jon B. Applequist, Search Committee Chairman, Department of Biochemistry and Biophysics, Iowa State University, Ames, Iowa 50011.** Complete application materials should be received by 31 January 1983, to be considered. *ISU is an Affirmative Action/Equal Opportunity Employer.*

Applications are invited for a tenure-track position at the **ASSISTANT PROFESSOR** level in the Department of Engineering-Physics-Systems at Providence College. Responsibilities will include undergraduate teaching and program and course development in one or more of the following concentration areas: instrumentation and computation science, energy management, applied systems science. A strong educational background in physics and applied science and a Ph.D. in one of the above multidisciplinary areas are required. Research experience is desirable. Date of appointment is September 1983. Applicants should send a letter of application, a résumé, and a list of three references to: **Dr. Joseph E. Robertshaw, Chairman, Department of Engineering-Physics-Systems, Providence College, Providence, R.I. 02918.** *Providence College is an Equal Opportunity/Affirmative Action Employer.*

Amherst College seeks an **ASSISTANT PROFESSOR** in the area of organismal biology with an emphasis on behavioral, physiological, or coevolutionary interests to begin 1 July 1983. Doctorate required; postdoctoral experience desirable. Teaching will include a team-taught ecology course with laboratory/field work; occasional interdisciplinary teaching encouraged. The candidate will develop an active research program including the supervision of student research. Three-year renewable contract, with tenure decision during the sixth year. Send curriculum vitae, copies of publications, and three letters of reference to:

**Dr. William M. Hexter, Chairman
Biology Department
Amherst College
Amherst, MA 01002**

The deadline is 15 February 1983.

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ASSISTANT/ASSOCIATE PROFESSOR. Research and teaching, tenure-track position. Research should be active in areas which impact on nutritional and/or safety aspects of food treatment or bioengineering. Teaching includes undergraduate and graduate courses in the general areas of food and/or processing and/or bioengineering, and nutritional biochemistry. Ph.D. required in food science, food toxicology, bioscience, or appropriately related areas. Send résumé and references to: **Dr. T. Hansen, Chairman Search Committee, Department of Nutrition and Food Sciences, Room 13-605, Drexel University, Philadelphia, Pa. 19104.** *Drexel University is an Equal Opportunity/Affirmative Action Employer.*

POSITIONS OPEN

ASSISTANT OR ASSOCIATE PROFESSOR position available at affiliate of Mount Sinai School of Medicine and Alcohol Research Center, in Departments of Medicine, Biochemistry, or Pharmacology. In addition to a fully equipped laboratory in an exciting research environment, funds are available for research on alcohol metabolism and the interaction of alcohol with drugs, lipids, and membranes. Send résumé and references to: **Dr. Charles S. Lieber, Alcohol Research Center, VETERANS ADMINISTRATION MEDICAL CENTER, 130 West Kingsbridge Road, Bronx, N.Y. 10468. An Equal Opportunity Employer.**

The Department of Surgery, Southwestern Medical School, is seeking applicants for: **ASSISTANT PROFESSOR—M.D.**, accredited general surgery residency, peripheral vascular fellowship, teaching and research experience. **INSTRUCTOR—M.D.**, accredited general surgery residency, interest in peripheral vascular surgery. Contact: **William J. Fry, M.D., Hudson-Penn Professor and Chairman, Department of Surgery, 5323 Harry Hines Boulevard, Dallas, Texas 75235. The University of Texas Health Science Center at Dallas is an Equal Opportunity Employer.**

ASSISTANT PROFESSOR, TENURE-TRACK POSITION. Researcher sought with strong background in neurobiology or molecular endocrinology with long-range interests in the neurobiology of aging and age-related diseases. The appointment will be jointly made through the Andrus Gerontology Center and the Program in Neural and Information Science at University of Southern California. Interested candidates should send curriculum vitae, brief statement of research interest, and names of four references to: **Dr. Caleb E. Finch, Andrus Gerontology Center, University of Southern California, Los Angeles, California 90089-0191.**

ASSISTANT PROFESSOR OF ANATOMY UNIVERSITY OF CONNECTICUT HEALTH CENTER

Tenure-track position available 1 July 1983 for a **neuroanatomist** with postdoctoral training and demonstrated evidence of the ability to develop an independent productive research program. Duties require participation in teaching basic and advanced courses in anatomical disciplines to medical, dental, and graduate students and conducting independent research. Research interests should complement and overlap with those of neuroscientists in the Department of Anatomy, having strengths in auditory studies, neurochemistry, and developmental neurobiology. Prior training in neuroanatomy required; prior experience in teaching anatomical disciplines desirable. Send curriculum vitae, summary of research program, and names of three references by 15 January 1983 to:

D. Kent Morest, M.D.

Chairman, Search Committee

Department of Anatomy

**The University of Connecticut Health Center
Farmington, Conn. 06032**

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ASSISTANT PROFESSOR—BIOCHEMISTRY. Fall 1983. Ph.D. in biochemistry with B.S. or A.B. in chemistry to develop new biochemistry courses, especially laboratory, teach some organic laboratory, and direct undergraduate research. *Women and minorities are encouraged to apply.* Send résumé, together with outline of research interests suitable for student participation, and three letters of recommendation by 31 December 1982 to: **Chemistry Search Committee, Lafayette College, Easton, Pa. 18042. Equal Opportunity Employer, M/F.**

ASSISTANT PROFESSOR OF BOTANY. Nine-month, tenure-track appointment beginning 1 September 1983 to engage in teaching and research in the Division of Life Sciences, University of Alaska-Fairbanks. Successful candidate will teach introductory botany and advanced courses. Research interest should emphasize field-oriented studies applicable to northern terrestrial environments. Applicants interested in plant-animal interactions are particularly invited. Curriculum vitae, graduate transcripts, and a list of five referees whom we may contact must be received by 15 January 1983. Reply to: **David F. Murray, Chairman, Botany Search Committee, Division of Life Sciences, University of Alaska, Fairbanks 99701. The University of Alaska is an Equal Opportunity/Affirmative Action Employer and Educational Institution.** Your application for employment with the University of Alaska may be subject to public disclosure if you are selected as a finalist.

POSITIONS OPEN

VISITING ASSISTANT PROFESSOR/BEHAVIORAL ECOLOGIST: Two-year leave replacement. Teach upper level courses in animal behavior and marine ecology and serve on graduate student and departmental committees. Active research is expected. Candidates are expected to have Ph.D. Preference given to individuals studying marine organisms. Send a letter of application and three letters of reference by 1 February 1983 to: **Dr. Nelson G. Hairston, Jr., Department of Zoology, UNIVERSITY OF RHODE ISLAND, Kingston, Rhode Island 02881. An Affirmative Action/Equal Opportunity Employer, M/F.**

ASSISTANT PROFESSOR OF BIOLOGY. The Department of Biology at Macalester College seeks a person for primary responsibility in teaching introductory biology, starting September 1983. The successful candidate will also teach human/animal physiology. Applicants must have Ph.D. and interest and background in computer applications in biology. Salary is competitive. Respond by 10 December 1982 for this tenure-track position with résumé, two reprints, and names of three references to: **E. P. Hill, Chair, Department of Biology, Macalester College, St. Paul, Minn. 55105. Macalester is an Affirmative Action/Equal Opportunity Employer.**

BIOCHEMIST

INVERTEBRATE BIOCHEMIST

The Biochemicals Department of E.I. du Pont de Nemours & Company has a Ph.D. level research position available in the Wilmington, Delaware, area for an invertebrate biochemist with a strong interest and background in receptor biochemistry, ion channel function, and/or neurotransmission.

The successful candidate will be expected to develop a fundamental research program and collaborate with electrophysiologists, entomologists, and chemists in designing and developing novel insect control agents.

Salary is competitive and supplemented by a strong benefits program. Qualified candidates should send curriculum vitae, names of three references, and a short statement of interest and experience to: **H. R. McLendon, Room 38988S, Du Pont Company, Wilmington, Delaware 19898.**

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ASSISTANT PROFESSOR—BIOLOGY, HISTOLOGY. Temporary position for spring semester (January to May 1983). Duties include teaching general biology lecture/laboratory and histology laboratory. Ph.D. preferred; Ph.D. candidate acceptable. Send credentials as soon as possible to: **Kenneth Wittig, Biology Department, Siena College, Loudonville (Albany), N.Y. 12211.**

ASSISTANT PROFESSOR—ENVIRONMENTAL TOXICOLOGY. Applications are being accepted for a tenure-track position to begin in August 1983, contingent upon legislative funding. Departmental interests are interdisciplinary and include applied environmental sciences, industrial hygiene/occupational health, and toxicology. An earned doctorate is required. Submit curriculum vitae and names of three references by 3 December 1982 to: **Dr. James Williams, Department of Environmental Health Sciences, University of South Carolina, Benson Room 306, Columbia, S.C. 29208; telephone: 803-777-6994. The University of South Carolina is an Equal Opportunity/Affirmative Action Employer.**

ASSOCIATE DIRECTOR: The Marine Sciences Research Center at State University of New York (SUNY) Stony Brook will have an opening for an associate director about 1 April 1983. Individual to work closely with director in facilities and program development and administration, and in fund raising. Individual may devote approximately one-fourth time to research. Candidates must have Ph.D., or equivalent experience in some area of the marine sciences, a significant publication record, and have demonstrated effectiveness in the design, development, and management of sponsored research projects and programs. Some experience in fund raising in the private sector is desirable. Initial appointment for 2 years on a permanent appointment track State line. Salary range: \$28,000 to \$32,000 per annum. Send résumé and have three letters of reference sent by 1 January 1983 directly to: **Chair, Associate Director Search Committee, Marine Sciences Research Center, SUNY Stony Brook, Stony Brook, N.Y. 11794. SUNY Stony Brook is an Equal Opportunity/Affirmative Action Employer. AK number 457.**

POSITIONS OPEN

ASSISTANT PROFESSOR, Department of Nutrition. Tenure-track position. Required: recent Ph.D. degree with background in nutrition and biochemistry, preferably with postdoctoral training and teaching experience. Candidate must be able to develop a strong and independent research program in basic nutrition or a nutritionally related area of intermediary metabolism. For more detailed information, write to: **Search Committee, Department of Nutrition, Cook College, Rutgers University, New Brunswick, New Jersey 08903.**

ASSISTANT PROFESSOR—OBSTETRICS AND GYNECOLOGY. Duke University Medical Center; and **ASSOCIATE DIRECTOR OF OBSTETRICS AND GYNECOLOGY,** Cape Fear Valley Hospital, Fayetteville, North Carolina.

Applicants are sought for a position as assistant professor in the Department of Obstetrics and Gynecology, Duke University Medical Center, with a joint appointment as associate director for obstetrics and gynecology, Cape Fear Valley Hospital, Fayetteville, North Carolina. Candidates must have completed 3 years of approved residency education in obstetrics and gynecology as well as a 2-year fellowship in maternal-fetal medicine as approved by the American Board of Obstetrics and Gynecology. The successful applicant will live in Fayetteville, North Carolina, and will be the associate director of an affiliated residency program in obstetrics and gynecology and have primary responsibility for obstetrical patient care on the teaching service of Cape Fear Valley Hospital. Anticipated salary: \$65,000. Application and three letters of recommendation are required. *Equal Opportunity/Affirmative Action Employer.* Inquiries should be addressed to: **Charles B. Hammond, M.D., Professor and Chairman, Department of Obstetrics and Gynecology, P.O. Box 3853, Duke University Medical Center, Durham, North Carolina 27710.**

ASSISTANT PROFESSOR OF PATHOLOGY—Position open for M.D. with background in pathology and strong research interest. Apply to: **Dr. Renato Baserga, Chairman, Department of Pathology, Temple University School of Medicine, Room 105 OMS, 3400 North Broad Street, Philadelphia, Pa. 19140. Equal Opportunity/Affirmative Action Employer.**

DEPARTMENT OF BIOLOGY Swarthmore College

Two 1-year leave replacement positions, preferably at the assistant professor level, starting September 1983. Applicants should have research experience and be able to teach in one or more of the following areas: vertebrate anatomy and physiology, neurobiology, animal behavior, developmental biology, and immunology. Candidates should have a strong commitment to undergraduate education.

Interested persons should submit: (i) curriculum vitae, (ii) statement of current teaching and research interests, and (iii) three letters of recommendation. All materials should be submitted by 17 December to:

**Dr. John B. Jenkins, Chairman
Department of Biology
Swarthmore College
Swarthmore, Pennsylvania 19081**

Swarthmore College is an Equal Opportunity Employer.

CELL BIOLOGIST/MICROBIOLOGIST: The Department of Biological Sciences at the George Washington University invites applications for the tenure-track position of assistant professor, to begin September 1983. Academic salary: \$19,000 to \$23,000, depending on experience. Applicant must have a Ph.D. Candidates are expected to teach an undergraduate course in microbiology, and undergraduate as well as graduate courses in cell biology (individuals with skills in chromosome technology and tissue culture will be given preference). Candidates will also be expected to initiate a strong research program. Curriculum vitae, undergraduate and graduate transcripts, a list of publications, a list of courses the applicant is prepared to teach, a statement of future research plans, and three letters of reference (all nonreturnable) should be sent to: **Dr. Stefan O. Schiff, Chairman, Department of Biological Sciences, The George Washington University, Washington, D.C. 20052.** Complete applications must be received by 1 March 1983. *The George Washington University is an Equal Opportunity/Affirmative Action Employer.*

PROGRAMMER/ANALYST

Interested position providing career growth for Programmer/Analyst to work with a multidisciplinary team of research scientists addressing significant problems concerning the effects of airborne pollutants on man and the environment. If you possess a Master's degree or Bachelor's degree plus 5 years of experience in computer science or a related field with strong emphasis in computer science, have good verbal and written communications skills and enjoy heavy user contact, we invite you to apply.

Applicants must have demonstrated skills in macro assembler and higher level programming languages, concurrent processing, interrupt handling, scheduling, operating systems input and output at the assembler level, data structures, state machine (table driven programs), information retrieval techniques, architecture of a mini or micro computer and operating system of a mini or micro computer. Experience with DEC LSI, -11; PDP-11, and VAX computers preferred.

If you are interested in being considered for this challenging and demanding position, please submit your resume to: Personnel Manager, Lovelace Inhalation Toxicology Research Institute, P.O. Box 5890, Albuquerque, NM 87115, or call (505) 844-9431.

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ANNOUNCEMENT

SCHOOL OF PUBLIC AND ENVIRONMENTAL AFFAIRS INDIANA UNIVERSITY

The School of Public and Environmental Affairs provides graduate and undergraduate degree programs, as well as research, professional, and technical services on six campuses of Indiana University. The following positions are available on the Bloomington Campus for academic year 1983-1984. Teaching at graduate and undergraduate levels will be expected. All applicants should have appropriate terminal degree and/or demonstration of equivalent research/creative abilities.

APPLIED EARTH SCIENTIST (assistant or associate professor)—Particular consideration given to candidates with experience in engineering geology and advanced degrees in both engineering and geology. Should demonstrate an ability in research and will be expected to establish an active research program in some aspect of applied earth science as well as participate in several major multidisciplinary research programs. Should have a Ph.D. in science or engineering.

ENVIRONMENTAL ENGINEER (assistant or associate professor)—Particular consideration given to candidates with experience in water resources and advanced degree work in both environmental science and engineering. Should demonstrate an ability in research and will be expected to establish an active research program in some aspect of water resources as well as to have a Ph.D. degree in science or engineering.

ENVIRONMENTAL TOXICOLOGIST (assistant professor)—Particular consideration given to candidates with experience in eco-toxicology. Candidates should have a Ph.D., Dr.P.H., or M.D. degree in science, medicine, public health, or engineering. Should demonstrate an ability in research and will be expected to establish an active research program in some aspect of environmental health as well as participate in several major multidisciplinary research projects.

Interested applicants should send curriculum vitae to the address listed below no later than 15 February 1983.

Dr. Roy Jumper, Associate Dean
School of Public and Environmental Affairs
Indiana University
Bloomington, Ind. 47405

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DEVELOPMENTAL THERAPEUTICS PROGRAM

The Division of Cancer Treatment, National Cancer Institute, National Institutes of Health, Public Health Service is seeking applicants for the position of Chief, Toxicology Branch to organize, plan, direct, and evaluate an Extramural Contracts Program involved in the investigation of the qualitative toxicities of potential antitumor agents and modalities in experimental animals. Research guidance provided for the development of organ specific toxicity assays and for investigations of the toxicity of second generation analogs. Toxicological assessments will be used in the preparation of investigational new drug applications. Continuous surveillance of the literature will be conducted for new developments in the field of toxicological evaluation of synthetic and natural products applicable to the needs of the Developmental Therapeutics Program.

Applicants should have advanced training at the Ph.D. level (or equivalent) in Pharmacology/Toxicology or closely related fields with extensive laboratory experience in Cytotoxic Drug Pharmacology and/or Toxicology for top consideration. Postdoctoral experience (or equivalent) in biomedical research and administration is required with

productivity being documented by publications, etc. Experience in administration of contracts preferred.

Position may be filled through Civil Service or Commissioned Corps of U.S. Public Health Service. Salary Range—\$39,689—\$57,500 depending on the qualifications of the applicant selected.

Position covered by Civil Service Requirement. Life insurance and health benefits offered. Duty Station—Silver Spring, Maryland. U.S. Citizenship required.

Submit application (Personal Qualifications Statement, SF-171) with names of three references, to: Ms. Sara Benesch, Personnel Management Branch, National Cancer Institute, Building 31, Room 3A32, National Institutes of Health, Bethesda, Maryland 20205. Applications must be received or postmarked by November 30, 1982. Call Ms. Benesch at (301) 496-6862 for further information.

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POSITIONS OPEN

BIOCHEMIST

Full-time position available in January 1983 or July 1983; teaching biochemistry with laboratory and developing an independent research project in an interest area of the applicant as it relates to health science. Ph.D. required. Interested persons with OTHER SPECIALTIES relevant to preclinical sciences are invited to submit a letter discussing teaching and research experience. Enclose curriculum vitae, with names and addresses of three references, to: Search Committee, Basic Science Division, Northwestern College of Chiropractic, 1834 South Mississippi River Boulevard, St. Paul, Minn. 55116. An Equal Opportunity Employer.

CHAIRPERSON, Department of Biochemistry and Biophysics. Applications invited from highly qualified individuals to head the Department of Biochemistry and Biophysics of the University of Pennsylvania School of Medicine. Address inquiries to: Nicholas K. Gonatas, M.D., Chairman, Biochemistry and Biophysics Search Committee, 410 Johnson Pavilion/G2, University of Pennsylvania School of Medicine, Philadelphia, Pa. 19104. An Equal Opportunity/Affirmative Action Employer.

FACULTY POSITION OPEN

Associate/assistant professor of surgery, Trauma Service, Division of General Surgery, available in The University of Texas Medical School at Houston. A full-time, tenure-track faculty position is open on this very active service for an individual with training and demonstrated excellence in trauma surgery and in clinical and/or laboratory research. This individual will also serve as surgical coordinator of the Surgical Intensive Care Unit.

- 1) Board Certification or
- 2) Board eligibility required.

Applications accompanied by curriculum vitae and full list of publications should be addressed to: Frank G. Moody, M.D., Professor and Chairman, Department of Surgery, The University of Texas Medical School at Houston, 6431 Fannin—Room 4020, Houston, Texas 77030. An Equal Opportunity/Affirmative Action Employer.

POSITIONS OPEN

BIOLOGIST. Tenure-track assistant/associate professor. Minimum requirement: Ph.D., postdoctoral training, teaching experience, prior independent extramural research funds. Candidate expected to teach M.S. level course in either molecular genetics, intermediary metabolism, or host-parasite relationships, with emphases on plants, animals, and microorganisms. Establish research program in one of these areas; in addition to rotation in teaching general biology, anatomy, or physiology. Submit curriculum vitae, names of three references, and statement of future goals by 15 January 1983 to: Dr. John Pagels, Biology Department, Virginia Commonwealth University, Richmond, Va. 23284. Affirmative Action/Equal Opportunity Employer.

CHAIRPERSON DEPARTMENT OF SURGERY UNIVERSITY OF PENNSYLVANIA SCHOOL OF MEDICINE

Application is invited from highly qualified individuals for the position of chairperson, Department of Surgery, University of Pennsylvania School of Medicine. Reply to:

Surgery Search Committee
Dean's Office, School of Medicine
University of Pennsylvania
Philadelphia, Pa. 19104

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DIRECTOR OF NMR LABORATORIES. Cornell University, Department of Chemistry, seeks a Ph.D. physical scientist with experience in operation and maintenance of state-of-the-art NMR (including superconducting) instrumentation. Familiarity with electronics and digital systems is also desirable but not required. Responsibilities include user supervision and instruction. Excellent opportunities for scientific, personal, and professional advancement in a major research university situated in the lake country region of central New York State. Send résumé to: Professor Bruce Ganem, Department of Chemistry, Baker Laboratory, Cornell University, Ithaca, New York 14853.

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POSITIONS OPEN

BIOCHEMISTRY FACULTY POSITION. The School of Chemistry, Georgia Institute of Technology, invites applications for a tenure-track position at the assistant/associate professor level. Candidates with research interests in genetic engineering or related areas of molecular biology are especially encouraged to apply but outstanding candidates with research interests in other areas of biochemistry will be considered. Send curriculum vitae, description of proposed research program, and three letters of recommendation to: Professor Leon H. Zalkow, Director, School of Chemistry, Georgia Institute of Technology, Atlanta, Ga. 30332. Georgia Tech is an Equal Opportunity/Affirmative Action Employer.

COMMUNITY ECOLOGIST. Applications are sought for a terrestrial plant community ecologist, beginning August 1983. Minimum qualifications include a Ph.D. in botany or life sciences and a strong commitment to field and community research. Teaching duties include introductory ecology, advanced community ecology, and an occasional section of general botany/biology. Postdoctoral experience is preferred. This position is tenure-track, open rank, with salary negotiable depending on experience and qualifications. Send curriculum vitae, a statement of research interests, and three letters of reference to: Dr. Linda L. Wallace, Chair, Ecology Search Committee, Department of Botany and Microbiology, University of Oklahoma, Norman, Okla. 73019. Applications must be postmarked by 1 January 1983. The University of Oklahoma is an Equal Opportunity/Affirmative Action Employer.

Applications invited for **HEAD OF BIOLOGY** in a tenure-track faculty position. Position requirements include Ph.D. in a biological science, 5 years of college teaching or equivalent, and effective leadership qualities. Teaching responsibilities include upper-level courses in specialty area, introductory biology and/or courses for allied health. All application documents required by 24 January 1983. Contact: Dean of Arts and Sciences, Armstrong State College, Savannah, Georgia 31406; telephone: 912-927-5252. An Affirmative Action/Equal Opportunity Employer.

SEARCH CONTINUED

VICE PRESIDENT FOR GRADUATE EDUCATION & RESEARCH THE UNIVERSITY OF CONNECTICUT

The University of Connecticut invites applications and nominations for the position of Vice President for Graduate Education and Research to begin as soon as possible.

The responsibilities of the position include oversight of the University Research Foundation, and of the Graduate School with master's and doctoral programs in most fields. The incumbent is one of five vice presidents reporting to the president. We are looking for a mature and articulate scholar in any academic field with strong research interests and achievements, with experience in administration, and with the ability to stimulate external funding from industry as well as from Federal and foundation sources.

Salary is negotiable, and will be commensurate with experience and professional standing. Applications and nominations should be sent by January 1, 1983. The names of referees should be included, but letters of reference will be called for only in behalf of short-listed candidates. Please send these materials to

Dean Julius A. Elias, Chairman
Search Committee
Vice President for
Graduate Education & Research
U-98, Storrs, CT 06268

THE UNIVERSITY OF CONNECTICUT IS AN
AFFIRMATIVE ACTION/EQUAL OPPORTUNITY EMPLOYER

Polytechnic Institute of New York seeks: DEAN of ARTS & SCIENCES

Polytechnic Institute of New York, a technological university with a total enrollment of approximately 5,000 and with campuses in Brooklyn, Farmingdale, Long Island, and White Plains, New York, invites applications and nominations for the position of Dean of Arts and Sciences.

The Dean of Arts and Sciences is the chief academic officer of the Division of Arts and Sciences, comprising the Departments of Chemistry, Physics, Mathematics, Humanities, Social Sciences, and Physical Education; and the Dean must be sensitive to the needs of all those departments. Reporting directly to the Provost, the Dean is responsible for the conduct of the programs of undergraduate education, graduate education, and research within the Division. The department heads of the Division will report directly to you. The Dean works closely with the Provost and other deans in budgeting and in planning all academic programs. Will also provide leadership for new research programs, initiate and coordinate collaborative programs with industry.

Nominations and applications should be submitted by December 1, 1982 to:

Dean of Arts and Sciences Search Committee/Box 307

Polytechnic Institute of New York

333 Jay Street, Brooklyn, New York 11201

equal opportunity employer m/f/h/v

DIRECTOR OF THORACIC SURGERY RESEARCH PROGRAM

Allegheny-Singer Research Corporation, a non-profit research organization, affiliated with Allegheny General Hospital, a 726-bed teaching and referral hospital in Pittsburgh, PA, is seeking qualified candidates with an MD or PhD for the position of Director of Thoracic Surgery Research Laboratory. Proven research experience is essential. Interest in clinical and preclinical research in myocardial preservation, and myocardial revascularization would be desirable.

The Director will serve as liaison between the Thoracic Surgery Research Laboratory, and other medical speciality research groups including Aging, Cardiology and Hypertension. The Director will also have responsibility for promoting research collaboration with other research organizations involved in medical and graduate/resident education.

Please send curriculum vitae and three references to: George J. Magovern, MD, Director, Thoracic Surgery Research Program, or for further information you may telephone, (412) 359-3715 or (412) 359-3597.

**ALLEGHENY-SINGER
RESEARCH CORPORATION**
Director, Department of Surgery
Allegheny General Hospital
320 E. North Avenue
Pittsburgh, PA 15212

An Equal Opportunity
Employer M/F/H

ANALYTICAL CHEMIST

At Midwest Research Institute (MRI) our R & D efforts span applications in such varied fields as the chemical, biological, life, energy, engineering, and materials sciences.

Expansion has created a challenging opportunity to review, assist, and advise on developing technical protocols/methods on a broad range of analytical problems (trace to major component levels; minerals to natural products, drugs, industrial chemicals, and so forth), with emphasis upon application to organic chemical analyses. Will direct special tasks and trouble shooting of problems, design experiments for the analysis of materials, review and evaluate data, and supervise staff development activities and publication efforts. Instrumentation emphasis is upon GC/HPLC.

Required is a Ph.D. in analytical or organic chemistry and a solid publications record, combined with five or more years of experience in application of a wide range of analytical techniques to organic chemical analysis. Strong communications, interdisciplinary, and interpersonal skills necessary.

MRI offers an excellent benefits program and paid relocation. Our Kansas City location offers broad recreational and cultural opportunities in a lower cost of living metropolitan area. Respond today by sending résumé or curriculum vitae and salary history to: **Larry Brown, MIDWEST RESEARCH INSTITUTE, 425 Volker Boulevard, Kansas City, Missouri 64110. An Equal Opportunity Employer.**

"Serving Science and Society"



MIDWEST RESEARCH INSTITUTE

UNIVERSITY OF NEBRASKA-LINCOLN DIRECTOR, SCHOOL OF LIFE SCIENCES

The director will be expected to provide strong, innovative leadership to a large group of scientists active in basic and applied biological research, to guide further development of the graduate and undergraduate programs, and to coordinate diverse community service efforts. Applicants should be distinguished scientists having research programs of demonstrated excellence and should possess strong qualities of leadership. The School of Life Sciences comprises 63 faculty covering the complete range of biological disciplines. The School is a major unit within the College of Agriculture in a variety of interdisciplinary teaching and research programs and administrative functions. Funding from external sources is approximately \$2 million. The School has well established undergraduate and graduate instructional programs which provide the basic biological education for all the other colleges of the University.

The successful candidate must be capable of directing and enhancing the growth of the school and its programs through outstanding intellectual and administrative leadership. Rank is professor with tenure; salary is competitive and negotiable. Applicants should send curriculum vitae which includes a description of research interests and achievements, relevant experience, and the names of three references by 31 January to:

**Chairperson, Director Search
School of Life Sciences
University of Nebraska-Lincoln
Lincoln, Nebraska 68588-0118**

*Affirmative Action/Equal Opportunity
Employer*

NATIONAL INSTITUTES OF HEALTH PUBLIC HEALTH SERVICE DEPARTMENT OF HEALTH AND HUMAN SERVICES

OPENING DATE: November 1, 1982/CLOSING DATE: November 30, 1982

(All applications must be post marked before closing date)

ASSOCIATE DIRECTOR, COMMUNICATIVE DISORDERS
NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE

The National Institutes of Health invites nomination and applications for the position of Associate Director, Communicative Disorders, National Institute of Neurological and Communicative Disorders and Stroke (NINCDS). This Institute conducts, fosters, and supports research and research training on the causes, prevention, diagnosis, and treatment of neurological, sensory, communicative, and muscle disorders. The Institute's efforts cover the spectrum of basic, applied, and developmental research. Programs under the responsibility of this position encompass intramural laboratory research and extramural (grants and contracts) activities in communicative disorders.

This is a Civil Service position in the Senior Executive Service (SES), with a salary range from \$54,755 to \$61,300 per annum (currently limited to \$58,500) depending on qualifications. Candidates may be eligible for Physicians Comparability Pay up to \$10,000 per year. Alternately, candidates may be eligible for appointment in the Commissioned Corps of the U.S. Public Health Service. The SES individual selected, if not presently in the SES, must serve a one-year probationary period.

The mandatory qualifications are: (1) meet the minimum educational requirements for Medical Officer, GS-602, or Health Scientist Administrator, GS-601, or equivalent combination of experience and training, which demonstrates a broad knowledge and understanding of major public health problems; and (2) have research experience and knowledge of research programs related to communicative disorders. In addition, candidates must meet the following managerial/executive qualifications: experience in the leadership/management or a basic or clinical research program, demonstrating competence to assume leadership responsibilities in: (1) assuring that national and agency goals and priorities are considered in carrying out the

functions and responsibilities of the organization; (2) establishing and maintaining relationships with key individuals and groups outside the organization; (3) directing and guiding programs and projects, including long-term and short-term planning and establishing objectives and priorities; (4) establishing procedures for the development and defense of the organization's budget, and allocating fiscal and personnel resources to support program implementation; (5) developing processes and overseeing activities to assure the fair and equitable employment of qualified persons, and implementing EEO/Affirmative Action objectives; (6) developing and implementing procedures for monitoring program performances, including periodic analysis and evaluation.

Candidates who meet the mandatory requirements will be further evaluated by the Search Committee on the following factors: managerial/ executive qualifications in excess of mandatory level; scientific reputation/peer recognition; advanced training and education in communicative disorders; and honors and awards indicative of outstanding contributions in the field of communicative disorders, and the degree to which they exceed the minimally qualified level of the mandatory managerial/executive qualifications.

Applications (Personal Qualifications Statement, SF-171) are to be sent to **Helen Price, Personnel Specialist, Building 31, Room 8A25, NINCDS, National Institutes of Health, Bethesda, Maryland 20205. For further information contact Helen Price on (301) 496-6334. A current curriculum vitae and bibliography must accompany all applications. Applications of women, members of minority groups and handicapped individuals are especially solicited.**

NIH is an Equal Opportunity Employer.

POSITIONS OPEN

ENVIRONMENTAL BIOCHEMIST

Assistant professor, tenure-track position in the Institute for Environmental Studies, University of Illinois at Urbana-Champaign. Ph.D. and demonstrated potential for research productivity required. Emphasis on original research on molecular or biochemical basis for environmental toxicology. The Institute is an interdisciplinary academic research unit of the University, and interactions with faculty and students in other colleges and departments are encouraged. Salary is dependent upon qualifications of candidate. Send curriculum vitae, brief description of research goals, and three letters of reference by 15 February 1983 to: **Professor Robert L. Metcalf, Chairman, Search Committee, 408 South Goodwin, Institute for Environmental Studies, Urbana, Illinois 61801; telephone: (217)-333-4178.** Available fall 1983. *Affirmative Action/Equal Opportunity Employer.*

DEAN, FACULTY OF NATURAL SCIENCES. College of Arts and Sciences, University of Hawaii at Manoa, Honolulu, Hawaii. Nominations and applications are invited for the position of dean of the Faculty of Natural Sciences. The faculty offers graduate and undergraduate programs in biology, botany, chemistry, general science, geology and geophysics, information and computer sciences, mathematics, meteorology, microbiology, oceanography, physics and astronomy, and zoology. A candidate should have an earned doctorate in one of the listed fields, experience as a department chairman or equivalent, and a strong record of teaching and research. Salary: minimum \$43,438; mid-point \$54,300. Interested parties should write to this address for detailed information on requirements before 7 January 1983:

**C. S. Ramage, Chairman
Natural Sciences Dean Search Committee
University of Hawaii at Manoa
2525 Correa Road
Honolulu, Hawaii 96822
Telephone: 808-948-8775**

An Equal Opportunity/Affirmative Action Employer

The Department of Aeronautics and Astronautics, Stanford University, seeks an outstanding person for appointment to a regular **FACULTY POSITION** in the field of **EXPERIMENTAL STRUCTURES**. Salary and rank will be commensurate with experience and qualifications. The successful candidate should have proven his or her excellence in experimental research on the application of modern materials to lightweight structure, with emphasis on advanced composites. The position will offer the opportunity to develop and improve departmental structures laboratories and to interact with outside research organizations. A candidate should have interest in teaching. Industrial experience is also desirable.

In addition to guiding the research of advanced-degree students, responsibilities will include regularly-scheduled graduate courses related to the specialty and occasional mechanics courses for undergraduate engineering students. *Stanford is an Affirmative Action Employer and welcomes applications from women and minority candidates.*

Inquiries should be made expeditiously to the chairman of the search committee: **Professor N. J. Hoff, Durand 355B, Department of Aeronautics and Astronautics, Stanford University, Stanford, California 94305. Telephone: 415-497-2441.**

FACULTY POSITION IN PLANT GENETICS

The University of California, Davis, Department of Vegetable Crops, invites application for a tenure-track faculty position at the assistant or associate professor level. A Ph.D. in genetics or related discipline in the plant sciences with training in the genetic improvement of crop plants is required. Research emphasis on the development of genetic strategies for vegetable crops improvement may focus on molecular or cellular approaches to the genetics of important characteristics including disease resistance or environmental stress responses; and will include germplasm development in celery or cole crops. The candidate will be expected to teach and advise in the undergraduate plant science or vegetable crops programs and/or the graduate programs in vegetable crops and genetics. Send curriculum vitae, including list of publications and teaching experience, academic transcripts, reprints, statement of career goals, and the names of at least three referees by 15 February 1983 to: **Dr. R. A. Jones, Search Committee Chair, Department of Vegetable Crops, University of California, Davis, California 95616.** Position open: May 1983. *We are an Equal Opportunity/Affirmative Action Employer and invite applications from all qualified individuals.*

POSITIONS OPEN

FACULTY POSITIONS IN BIOCHEMISTRY. Applications are invited for two tenure-track positions at the assistant professor level. Candidates should have two or more years of postdoctoral experience and a strong commitment to research. Preference will be given to individuals with a background in molecular biology interested in new areas of the biochemistry of eukaryotes. Please send curriculum vitae and a summary of research plans and arrange to have three letters of recommendation forwarded to: **Search Committee, Department of Biochemistry, Dartmouth Medical School, Hanover, New Hampshire 03756.** *Dartmouth Medical School is an Equal Opportunity/Affirmative Action Employer.*

GENERAL BIOLOGIST. Full-time position at the assistant or associate professor level, available 1 August 1983. Responsibilities include a rigorous course in molecular-based general biology for majors and an upper level course in immunology, pharmacology, neurobiology, or a related area. A broadly trained Ph.D. with teaching experience is preferred; commitment to undergraduate teaching and the liberal arts tradition is essential. Salary commensurate with rank and experience.

Ursinus College is a private, coeducational, liberal arts college with an enrollment of 1100 and is located 26 miles northwest of Philadelphia. Send curriculum vitae and the names and addresses of three referees to: **Dr. Peter F. Small, Search Committee Chairman, Department of Biology, Ursinus College, Collegeville, Pa. 19426,** no later than 15 January 1983.

INSTRUCTOR—GENERAL BIOLOGY. Nontenure-track. Primary duties: supervision and coordination of laboratory preparation for multisection courses in biology with the possibility of a lecture assignment; 12-month appointment. M.S./M.A. in biological science minimal; experience desired. Position available 1 July 1983. Application deadline: 1 April 1983. Send curriculum vitae, transcripts, and three letters of recommendation to: **Dr. C. F. Bailey, Department of Biology, SB 405, University of Arkansas, Fayetteville, Ark. 72701.** *An Equal Opportunity/Affirmative Action Employer.*

MEDICAL DIRECTOR OF BLOOD BANK. The Department of Pathology has an opening for a physician, Board-certified or eligible in pathology or other appropriate specialty boards, and eligible for licensure in Florida. Major responsibilities include supervising the immunohematology, hemotherapy, and paternity testing services at 480-bed teaching hospital; teaching residents and medical students; and developing an independent research program. Salary and rank are commensurate with academic background and experience (assistant or associate professor) with anticipated starting date of 1 March 1983. Forward applications by deadline of 1 February 1983 to: **Juan C. Scornik, M.D., Associate Professor, Department of Pathology, Box J-275, JHMC, University of Florida, Gainesville, Florida 32610.** *An Equal Employment Opportunity/Affirmative Action Employer.*

MEDICINE—(Number 347) Associate professor/professor. Should be Board-eligible in internal medicine with experience in clinical aspects of rheumatic diseases. Laboratory training and publications in immunological areas desirable. Should be capable of carrying out independent investigative program in some immunological aspects of the connective tissue diseases.

Applicants should send curriculum vitae, identifying vacancy number for which they are applying, to:

**Morris Reichlin, M.D.
Chief of Immunology Section
Department of Medicine
University of Oklahoma Health Sciences Center
P.O. Box 26901
OMH—South Pavilion
Oklahoma City, Oklahoma 73190
We are an Equal Opportunity Employer**

PATHOLOGY. Position open at assistant or associate professor level, tenure-track. Current active programs in matrix architecture, chemistry and biomechanics, renal structure; and cell-virus interactions. New program in biomaterials pathology. Expected to participate in medical school and postgraduate teaching. Clinical opportunities open. Contact: **Robert L. Trelstad, M.D., Chairperson, Department of Pathology, UNIVERSITY OF MEDICINE AND DENTISTRY OF NEW JERSEY—Rutgers Medical School, P.O. Box 101, Piscataway, N.J. 08854.** *An Equal Opportunity/Affirmative Action Employer, M/F.*

POSITIONS OPEN

NEUROBIOLOGY/ANIMAL BEHAVIOR. Biology Department seeks Ph.D. for 3-year, tenure-track appointment, September 1983. Teach courses in neurobiology, animal behavior, and/or comparative physiology, and participate in team-taught introductory courses. Active research program which can include senior undergraduates is expected. Send curriculum vitae, statement of research activities, and reference letters to: **Dr. C. Thomas Settemire, Biology Department, Bowdoin College, Brunswick, Maine 04011.** Deadline: 1 January 1983. *Affirmative Action/Equal Opportunity Employer.*

PHYSICAL ANTHROPOLOGIST—ANATOMIST

The Department of Anatomy and Neurobiology of the Washington University School of Medicine is searching for physical anthropologists with an active research program in paleontology, evolutionary biology, or primate functional anatomy. They must have real interest, as well as experience, in teaching human anatomy to medical students. Affiliation with the Department of Anthropology for research, and graduate student contact will be encouraged. All levels of appointment are available. Please submit curriculum vitae and names of three references by 15 December 1982 to:

**Dr. Roy R. Peterson, Chairman, Search Committee
Washington University School of Medicine
660 South Euclid
St. Louis, Mo. 63110**

An Affirmative Action/Equal Opportunity Employer

Applications are invited for a faculty appointment in **PHYSICAL OCEANOGRAPHY**

which is to be made in the **PHYSICS DEPARTMENT** for 1 June 1983, subject to final budgetary approval. Rank and salary are negotiable and commensurate with the qualifications of the appointee. Considerable research experience beyond a Ph.D. degree is preferred. The position offers a challenging academic career with stimulating research opportunities focusing in the Northwest Atlantic and the Canadian Arctic. The department has an active group engaged in field studies of fjords in Newfoundland, Labrador, and Baffin Island and the submarine canyons of the Grand Banks, and in the application of a numerical sea-ice model to the Labrador Sea and Baffin Bay. This group interacts closely with other oceanographers, both inside and outside the University, through the Newfoundland Institute for Cold Ocean Science.

Candidates are sought whose primary interests are in theoretical investigations of continental shelf and coastal dynamics but ours is a new and growing program and qualified individuals with experience in any area of physical oceanography should apply. An interest in interdisciplinary research and cooperation would be an asset. The appointment will include teaching duties at the graduate and undergraduate levels. Applications, including curriculum vitae and the names of three referees, or requests for information, should be addressed to:

**Head, Department of Physics
Memorial University of Newfoundland
St. John's, Newfoundland, Canada A1B 3X7
Telephone: 709-737-8738**

In accordance with Canadian Immigration regulations, this advertisement is directed to Canadian citizens and landed immigrants in the first instance.

PLANT PATHOLOGIST. Ph.D. or M.S. with several years of experience, to work in Nicaragua. Responsibilities include development of research program, training, consulting, diagnostics/extension. Spanish essential. Salary commensurate with experience. Two-year contract, possibly renewable. Experience or interest in alternatives to chemical control would be useful. Send résumé to: **New World Agriculture Group, c/o John Vandermeer, Division of Biological Sciences, University of Michigan, Ann Arbor, Mich. 48109.**

POSTDOCTORAL POSITION available immediately for recent Ph.D. in biochemistry, physiology, or endocrinology, to study the endocrine, physiological, and behavioral effects of the hypothalamic releasing hormone. Experience with the development of RIA, RRA, and HPLC techniques is necessary. Possible 3-year appointment. Send curriculum vitae and names of three references to:

**Dr. Ned Kalin
Psychiatry Service
William S. Middleton Memorial Veterans Hospital
2500 Overlook Terrace
Madison, Wis. 53705
Equal Opportunity Employer**

STAFF SCIENTIST

In Gene Expression

A growing, well-capitalized biotechnology firm, utilizing the latest techniques for basic and applied research in molecular biology, is seeking a recent Ph.D. in molecular biology/biochemistry, with experience in cloning and nucleic acid biochemistry, to work in the area of heterologous gene expression in bacteria.

This position offers career advancement potential in a stimulating scientific environment, a competitive salary, equity participation, and a complete benefits package.

Qualified candidates should forward their resumes in confidence to: Dr. William A. Strycharz; Genetics Institute; 225 Longwood Avenue; Boston, Massachusetts 02115.

GENETICS
INSTITUTE

CSIRO

SENIOR MARINE ECOLOGIST
A\$33,300 to A\$43,800 PER ANNUM
DIVISION OF FISHERIES RESEARCH
MARMION LABORATORY
PERTH, WA, AUSTRALIA

CSIRO has a broad charter for research into primary and secondary industry areas. The Organization has approximately 7,400 employees, 2,900 of whom are research and professional scientists, located in divisions and sections throughout Australia.

GENERAL: The CSIRO Marine Laboratories which include the Division of Fisheries Research and the Division of Oceanography is Australia's principal marine research institution, employing about 200 scientists and support staff investigating the physical, chemical, and biological features, including fisheries, of the oceans around Australia. The main laboratory is in Sydney, with smaller laboratories in Brisbane and Perth. Two well equipped chartered vessels (53m and 43m) are available for research.

At its Perth laboratory the Division of Fisheries Research is studying the coastal limestone reef systems of Western Australia, the habitat of the western rock lobster, which is one of Australia's most important fisheries. These interdisciplinary studies aim to describe the coastal food webs and include physical oceanography, nutrient and chemical fluxes, microbial interactions, seagrass and seaweed biology, limestone and coral reef ecology as well as specialist studies of the larval and juvenile stages of the western rock lobster. Studies of other invertebrates and fishes of the system may also be undertaken.

The Marmion Laboratory, which is located about 25 km. northwest of Perth, has a close liaison with the University of Western Australia and the Western Australian Marine Research Laboratories. The appointee will be located at the Marmion Laboratory.

DUTIES: The appointee will lead the comprehensive coastal ecology program, on which there are employed 10 scientists and 10 support staff and will also initiate and conduct a vigorous personal research program.

QUALIFICATIONS: This senior position requires a marine ecologist with an outstanding record of personal research achievement, capable of coordinating a range of research activities and with experience in leading a research group. He or she must have a Ph.D. degree or equivalent in one of the above biological disciplines, plus a minimum of 12 years of postdoctoral experience.

TENURE: Indefinite, with Australian Government Superannuation benefits available.

APPLICATIONS: In writing, quoting reference number A2311 and giving full personal particulars, including details of qualifications and experience, copy of academic transcripts, and the names of at least three professional references, should reach:

The Acting Chief
Division of Fisheries Research
CSIRO
P.O. Box 21
Cronulla, NSW 2230, AUSTRALIA

By 17 December 1982.

NATIONAL INSTITUTES OF HEALTH PUBLIC HEALTH SERVICE DEPARTMENT OF HEALTH AND HUMAN SERVICES

OPENING DATE: November 1, 1982/CLOSING DATE: November 30, 1982

(All applications must be post marked before closing date)

ASSOCIATE DIRECTOR, NEUROLOGICAL DISORDERS NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE

The National Institutes of Health invites nomination and applications for the position of Associate Director, Neurological Disorders, National Institute of Neurological and Communicative Disorders and Stroke (NINCDS). This Institute conducts, fosters, and supports research and research training on the causes, prevention, diagnosis, and treatment of neurological, sensory, communicative, and muscle disorders. The Institute's efforts cover the spectrum of basic, applied, and developmental research. Programs under the responsibility of this position encompass intramural laboratory research and extramural (grants and contracts) activities in fundamental neurological disorders, stroke and central nervous system trauma.

This is a Civil Service position in the Senior Executive Service (SES), with a salary range from \$54,755 to \$61,300 per annum (currently limited to \$58,500) depending on qualifications. Candidates may be eligible for Physicians Comparability Pay up to \$10,000 per year. Alternately, candidates may be eligible for appointment in the Commissioned Corps of the U.S. Public Health Service. The SES individual selected, if not presently in the SES, must serve a one-year probationary period.

The mandatory qualifications are: (1) meet the minimum educational requirements for Medical Officer, GS-602, or Health Scientist, GS-601, or equivalent combination of experience and training, which demonstrates a broad knowledge and understanding of major public health problems; and (2) have research experience and knowledge of research programs related to neurological disorders. In addition, candidates must meet the following managerial/executive qualifications: experience in the leadership/management or a basic or clinical research program, demonstrating competence to assume leadership responsibilities

in: (1) assuring that national and agency goals and priorities are considered in carrying out the functions and responsibilities of the organization; (2) establishing and maintaining relationships with key individuals and groups outside the organization; (3) directing and guiding programs and projects, including long-term and short-term planning and establishing objectives and priorities; (4) establishing procedures for the development and defense of the organization's budget, and allocating fiscal and personnel resources to support program implementation; (5) developing processes and overseeing activities to assure the fair and equitable employment of qualified persons, and implementing EEO/Affirmative Action objectives; (6) developing and implementing procedures for monitoring program performances, including periodic analysis and evaluation.

Candidates who meet the mandatory requirements will be further evaluated by the Search Committee on the following factors: managerial/executive qualifications in excess of mandatory level; scientific reputation/peer recognition; additional training and education in neurological disorders; and honors and awards indicative of outstanding contributions to the field of neurological disorders, and the degree to which they exceed the minimally qualified level of the mandatory managerial/executive qualifications.

Applications (Personal Qualifications Statement, SF-171) are to be sent to Helen Price, Personnel Specialist, Building 31, Room 8A25, NINCDS, National Institutes of Health, Bethesda, Maryland 20205. For further information contact Helen Price on (301) 496-6334. A current curriculum vitae and bibliography must accompany all applications. Applications of women, members of minority groups and handicapped individuals are especially solicited.

THE NATIONAL INSTITUTES OF HEALTH IS AN EQUAL OPPORTUNITY EMPLOYER.

POSITIONS OPEN

THE BOTANY DEPARTMENT OF DUKE UNIVERSITY seeks a **PLANT MOLECULAR BIOLOGIST** with expertise in recombinant DNA technology for a tenure-track position at the assistant professor level. The individual is expected to establish an active research program, contribute to departmental course offerings, and participate in the interdepartmental graduate program in genetics and/or cell and molecular biology. Send curriculum vitae, including transcripts, statement of research plans, reprints of representative publications, and the names of three references, to: **Dr. James N. Siedow, Chairman of the Search Committee, Department of Botany, Duke University, Durham, N.C. 27706.** Deadline: 15 December 1982. *An Affirmative Action/Equal Opportunity Employer.*

POSTDOCTORAL POSITIONS IN CARCINOGENESIS available immediately. Successful candidates will join an interdisciplinary research program emphasizing mechanisms of carcinogenesis by chemicals, radiation, and retroviruses and related areas such as molecular genetics, DNA repair, membranes, and tumor immunology. Beginning stipend is \$15,000; U.S. citizenship or permanent residency required. Persons soon to be awarded or holding recent Ph.D., M.D., or D.V.M. degrees are invited to write for information to: **Training Office, University of Tennessee—Oak Ridge Graduate School of Biomedical Sciences, Biology Division, Oak Ridge National Laboratory, Oak Ridge, Tenn. 37830.** *An Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL POSITIONS available to develop and study animal models of temporal lobe epilepsy and epileptic brain damage. One position requires experience with electrophysiological techniques in the mammalian CNS. Send curriculum vitae and two reference names to: **Dr. J. Victor Nadler, Department of Pharmacology, Duke University Medical Center, Durham, North Carolina 27710.** *Duke University is an Affirmative Action/Equal Opportunity Employer.*

POSTDOCTORAL POSITION available for Ph.D. or M.D. in the area of experimental cancer chemotherapy. Research will involve the development of a model of human osteosarcoma in mice, and the elucidation of determinants of intrinsic sensitivity to chemotherapeutic agents. This will include studies of drug metabolism, biochemical parameters, and developmental therapeutics in vivo. Candidates should have experience in biochemistry or pharmacology. Send curriculum vitae and three letters of reference to: **Dr. Janet A. Houghton, Division of Biochemical and Clinical Pharmacology, St. Jude Children's Research Hospital, 332 North Lauderdale, Memphis, Tenn. 38101.** *An Equal Opportunity Employer.*

BARROW NEUROLOGICAL INSTITUTE—POST DOCTORAL POSITIONS. Immediate opportunities exist to join NIH-funded laboratories within the research division of a major neurological institute. (i) Research position available in laboratory investigating the neural organization of the primate visual system, with emphasis on thalamocortical and claustric connections. Opportunity exists for combining neuroanatomic, electrophysiological, and electron microscopic techniques. Interested candidates trained in neuroanatomy or sensory/physiological psychology should contact **Dr. Russell G. Carey.** (ii) Position available for multidisciplinary research concerning mammalian CNS acetylcholine receptors. Investigations involve biochemical, pharmacological, immunological, and histochemical detection of putative receptor sites, and electrophysiological studies of cholinergic function in cell cultures. Interested candidates trained in any of the above disciplines should contact **Dr. Ronald J. Lukas.** Candidates should send curriculum vitae, names and addresses of three references, and a brief statement of research experience and objectives to: **Dr. Carey or Dr. Lukas, Division of Neurobiology, Barrow Neurological Institute, St. Joseph's Hospital and Medical Center, 350 West Thomas Road, Phoenix, Ariz. 85013; telephone: 602-241-3380.** *Equal Opportunity Employer.*

POSTDOCTORAL POSITION available immediately for basic research in plant disease, to involve pathotoxins or phytoalexins. Experience in either biochemical or microbiological techniques, particularly those used in immunology or in the isolation of fungal mutants, is desired. Curriculum vitae and references to: **Harry Wheeler or David Smith, Plant Pathology Department, University of Kentucky, Lexington, Ky. 40546.** *An Equal Opportunity/Affirmative Action Employer.*

POSITIONS OPEN

POSTDOCTORAL POSITION—The Respiratory Physiology Group of the Department of Physiology, University of Pennsylvania, School of Medicine, invites applications for postdoctoral research positions in the field of respiratory physiology. Representative research areas include: chemoreception, metabolism-circulation coupling, fetal/maternal circulation, mitochondrial reactions, metabolism and cell biology of various lung cells including type 2 Alveolar cells and smooth muscle, carbonic anhydrase. Address inquiries to: **Dr. Ronald F. Coburn, Education Officer, Department of Physiology, A-201 Richards Building G/4, University of Pennsylvania, School of Medicine, Philadelphia, Pa. 19104.** *Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL POSITION available in early 1983 involving research in mammalian cell-virus systems on DNA replication and repair and the mechanism of mutagenesis by chemical carcinogens. Salary: \$17,500 plus benefits. Please send curriculum vitae to:

**Liebe F. Cavalieri, Ph.D.
Sloan-Kettering Institute
Walker Laboratory
145 Boston Post Road
Rye, New York 10580**

Post Doctoral Positions

- Design, synthesis, characterization, and application of new fluorescent probes
- Flow cytometry and multiparameter cell analysis
- Quantitative fluorescence microscopy and image analysis



Post Doctoral Candidates apply directly to the Center for Fluorescence Research in Biomedical Sciences, Carnegie-Mellon University, 4400 Fifth Ave., Pittsburgh, PA 15213
D. Lansing Taylor
Alan Waggoner
Robert F. Murphy
Fred Lanni

Graduate Students apply through Biological Sciences.

POSTDOCTORAL POSITION available immediately for a recent Ph.D. in biochemistry, molecular biology, or related discipline with experience in analytical techniques. Background in tissue culture, connective tissue metabolism preferred. Send inquiries to: **Naomi Deutsch, TEMPLE UNIVERSITY, Personnel Office, 1601 North Broad Street, Philadelphia, Pa. 19122.** *Affirmative Action/Equal Opportunity Employer.*

POSTDOCTORAL POSITION. A position is available for research on Leydig cell physiology in vitro, starting 1983. Experience in tissue culture and/or reproductive physiology preferred. Send curriculum vitae and letters of recommendation to: **Dr. Jennie Mather, The Population Council, 1230 York Avenue, New York, N.Y. 10021.**

POSTDOCTORAL POSITION IN MOLECULAR BIOLOGY available to study the molecular control mechanism of gene expression in mammalian cells. Research will involve using recombinant DNA to probe genes whose expression is regulated during the animal cell cycle. Experience in tissue culture and DNA sequencing will be useful. Send résumé, research interest, and three references to: **Dr. Amy Lee, Department of Biochemistry, University of Southern California, School of Medicine, 2025 Zonal Avenue, Los Angeles, Calif. 90033.**

POSTDOCTORAL POSITION available immediately to study molecular and developmental aspects of *Drosophila* ribosomal protein expression. Must have Ph.D. or equivalent. Experience in molecular biology, recombinant DNA techniques/protein chemistry desirable. Send résumé and two or more letters to: **Yean Chooi, Biology, Indiana University, Bloomington, Ind. 47405.** Telephone: 812-335-0630, 812-339-6828. *Indiana University is an Equal Opportunity/Affirmative Action Employer.*

POSITIONS OPEN

POSTDOCTORAL POSITION available to study the metabolism of opioid peptides by brain and other tissues. Studies will focus on the characterization and localization of enzymes degrading opioid peptides. Degree in biochemistry preferred. Tax-free stipend available. Position open 1 December 1982. Send curriculum vitae and references to: **Dr. Louis B. Hershey, Department of Biochemistry, University of Texas Health Science Center at Dallas, 5323 Harry Hines Boulevard, Dallas, Texas 75235.** *An Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL POSITION

Available immediately for a period of 2 to 3 years, to work on problems related to the structure and functions of microtubules in mammalian cells. A good background in biochemistry and cell biology is required. Initial salary in the range of \$17,000 to \$20,000, depending upon experience. Send curriculum vitae to: **Dr. R. S. Gupta, Department of Biochemistry, McMaster University, Hamilton, Ontario, Canada L8N 3Z5.**

POSTDOCTORAL POSITION IN NEUROPHARMACOLOGY: Two-year postdoctoral research position for Ph.D. in biochemistry, pharmacology, or neurobiology available in Pharmacology for research on metabolism, function, and pharmacology of amino- and iminoacids in brain using mainly chromatographic (TLC, HPLC and GC-MS) methodology. Salary: \$15,000 to \$18,000, depending on experience. Available from 15 January 1983. Send curriculum vitae, list of publications, and names of three references to: **Dr. E. Giacobini, Chairman, Department of Pharmacology, Southern Illinois University School of Medicine, P.O. Box 3926, Springfield, Ill. 62708.** Deadline to apply: 15 December 1982. *An Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL POSITION available immediately, to study mechanisms of recombination in bacteriophage, employing genetic engineering, protein and nucleic acid biochemistry, and genetics. Research experience in at least one of these areas and interest in the others essential. Send curriculum vitae and letters of recommendation to: **Dr. Anthony Poteete, Department of Molecular Genetics and Microbiology, University of Massachusetts Medical School, 55 Lake Avenue North, Worcester, Mass. 01605.**

POSTDOCTORAL RESEARCHER. A position as postdoctoral scientist in reproductive physiology will be available in January 1983 for a period of up to 2 years. Minimum salary for first year is \$17,000, with consideration made for prior relevant postdoctoral experience. Research in primate in vitro fertilization, blastomere separation, and embryo transfer will be under supervision of Dr. Thomas J. Kuehl, head of Perinatal Biology Program. Interested candidates should respond by 1 January 1983 to: **Personnel Manager, Southwest Foundation for Research and Education, P.O. Box 28147, San Antonio, Texas 78284.** Include curriculum vitae, a description of research interests, and names of three references, including major professor, in initial correspondence. *An Equal Opportunity/Affirmative Action Employer*

POSTDOCTORAL RESEARCHER. Position presently available for Ph.D. in biochemistry or related field to study lipoprotein metabolism and atherosclerosis in nonhuman primates under supervision of Dr. Rampratap S. Kushwaha, associate scientist. Applicant should be experienced with methods in protein biochemistry and metabolism. Position extends up to 2 years. Minimum first year salary is \$17,000 with consideration made for prior relevant postdoctoral experience. Interested candidates should respond by 1 January 1983 to: **Personnel Manager, Southwest Foundation for Research and Education, P.O. Box 28147, San Antonio, Texas 78284.** Include curriculum vitae, a description of research interests, and names of three references, including major professor, in initial correspondence. *An Equal Opportunity/Affirmative Action Employer*

POSTDOCTORAL/RESEARCH ASSOCIATE positions available October 1982: (i) For research in somatic cell genetics with emphasis on expression and organization of liver specific genes, experience in recombinant DNA technology desired; (ii) For research and development of human hepatocyte cell culture system, experience in epithelial cell culture desired. Send curriculum vitae, with description of research background, interests, and names and addresses of three references to: **Dr. Gretchen J. Darlington, Department of Pathology, Baylor College of Medicine, Texas Children's Hospital, P.O. Box 20269, Houston, Texas 77030.**

ST. JUDE CHILDREN'S RESEARCH HOSPITAL

DIRECTOR

Qualified applicants and nominations are being sought for the position of Director of St. Jude Children's Research Hospital, an independent cancer research institute. The faculty of over 100 outstanding basic and clinical scientists conducts clinical research in the areas of hematology-oncology, pathology, general pediatrics, and infectious diseases and basic research in biochemistry, immunology, pharmacology, virology, and molecular biology. Suitable candidates will have internationally recognized achievement in research and will have demonstrated experience in effectively managing complex multidisciplinary programs.

All inquiries and nominations, which will be treated in confidence, should be sent to **Dr. Stephen Hersh, Search Committee Chairman, St. Jude Children's Research Hospital, 332 N. Lauderdale, P.O. Box 318, Memphis, TN. 38101.** St. Jude Children's Research Hospital is an Equal Opportunity Employer.

Hindustan Lever Limited, the India based Company with UNILEVER participation, has more than 10 manufacturing units in different regions of India and a modern Research Centre, located on a 14 acre plot at Andheri, a suburb of Bombay.

The Centre offers scope to work in an interdisciplinary environment with a broad range of research activity, has programmes of Physical Chemistry/Biotechnology and needs Research Scientists in the following areas:

PHYSICAL CHEMISTRY/CATALYSIS: Surface chemistry and colloid science, and heterogeneous/homogeneous catalytic systems and reactions for application to developing new products and understanding mechanisms. Spectroscopy and Computer applications envisaged.

FERMENTATION MICROBIOLOGY: Microbial genetics/biochemistry/fermentation. Development of commercially important strains by gene cloning, mutation and hybridisation to manipulate characters such as production of extracellular enzymes and tolerance to alcohol, acids and osmotic pressure.

IMMUNOLOGY: Immunochemistry, Cell biology, Hybridoma technology, separation and purification of monoclonal antibodies and standardization of reagents. Clinical application of hybridoma derived products for purpose of immuno-diagnosis/prophylaxis.

BIOCHEMISTRY: Nutritional and Enzyme biochemistry. Biosynthesis and role of polysaccharides, glycoproteins and lipids in biological systems and cellular interactions, Identification and evaluation of new product concepts.

PLANT GENETICS/TISSUE CULTURE: Technology in genetic engineering and protoplast fusion in plants for a programme in the clonal propagation of high yielding crop varieties.

TOXICOLOGY: Evaluation of safety in use of novel ingredients/products. Improve methodology of assessment of hazard and generate understanding of toxic mechanisms, immunotoxicology and genotoxicology. Strong bias for biochemical pharmacology.

Applicants should hold Doctorate degree in appropriate disciplines with excellent academic record and should also have adequate post-doctoral research experience in the relevant fields in a University, Research Institution or Industry. They should be able to formulate research proposals and carry out investigative work independently. Preferred age 30-35 years.

The positions offer competitive salaries with benefits like housing, provident fund, pension etc. and good career prospects for Indian Scientists residing outside India and desirous of pursuing research careers on return to India.

Applications accompanied with curriculum vitae should be sent to **Research Director, Hindustan Lever Research Centre, ICT-Link Road, Chakala, Andheri East, Bombay 400 099, India.**

Congressional Science and Engineering Fellowships

Applications Invited

The American Association for the Advancement of Science (AAAS) invites applications for a 1-year Congressional Science and Engineering Fellowship it will offer for the period beginning 1 September 1983. The Fellowship Program provides an opportunity for accomplished and societally aware postdoctoral to mid-career scientists and engineers to participate in and contribute to the public policy-making processes within the Congress for approximately 1 year. Fellows work as special legislative assistants within the congressional staff system.

Persons may apply from any physical, biological, or behavioral science or any field of engineering. The term "science" is used broadly to include the system sciences, public health, and other technical professions. In addition to the Fellowship awarded by the AAAS, about 25 others are given by the 20 other participating professional societies. The AAAS runs a year-long educational program for the set of Congressional Science and Engineering Fellows. Addresses of all participating societies are available from the address listed below.

The 1983-84 AAAS Congressional Science and Engineering Fellow will receive a stipend of \$24,000; an additional \$1500 is available for relocation expenses and travel in connection with the Program.

In order to obtain detailed information on the program and specific application requirements write:

**Congressional Science and Engineering Fellow Program
American Association for the Advancement of Science
1776 Massachusetts Avenue, NW
Washington, D.C. 20036**

The deadline for application is 1 February 1983. The award will be announced around 1 May 1983.

AAAS Memberships and Subscriptions

• Whenever you write us about your membership or subscription, please attach a Science address label to ensure prompt service.

• **Mail to:** Membership and Subscription Records, AAAS, 1515 Massachusetts Ave., NW, Washington, D.C. 20005.

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POSITIONS OPEN

POSTDOCTORAL POSITION available in molecular biology in the area of molecular human genetics. Ph.D. degree with training in RNA and DNA biochemistry and recombinant DNA technology is desired. Salary negotiable. Send résumé and three letters of reference to: **Dr. John T. Wilson, Department of Cell and Molecular Biology, Medical College of Georgia, Augusta, Georgia 30912. An Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL POSITION available winter 1983 to study drug resistance and surface biochemistry using monoclonal antibodies and human mammary epithelial cells. Applicant should have strong background in biochemistry and/or molecular biology. Send curriculum vitae and three letters of reference to: **Adeline J. Hackett, Ph.D., Peralta Cancer Research Institute, 3023 Summit Street, Oakland, Calif. 94609.**

POSTDOCTORAL RESEARCH ASSOCIATES. Two positions for recent Ph.D.'s with strong backgrounds in biochemistry and chemistry to study cytochrome P-450 and carcinogen metabolism. Available now. Send curriculum vitae to: **Dr. C. S. Yang, Department of Biochemistry, University of Medicine and Dentistry of New Jersey—New Jersey Medical School, 100 Bergen Street, Newark, N.J. 07103. An Equal Opportunity/Affirmative Action Employer, M/F.**

POSTDOCTORAL RESEARCH ASSOCIATE—Position available immediately to study ultrasensitive detection of hapten enzyme complexes. Applicants should be a recent Ph.D. with a background in immunology. Some experience with hybridoma technology is also desirable. Please send curriculum vitae, a brief description of research interests, and the names of three references to: **Dr. Roger Dean, Division of Community Medicine, The University of New Mexico, Albuquerque, N.M. 87131; telephone: 505-277-5987. An Equal Opportunity Employer.**

POSTDOCTORAL OR RESEARCH ASSOCIATE position open immediately for project on electrophysiology, contractile mechanics, and protein biochemistry of vascular smooth muscle. Applicants with prior experience in areas of vascular physiology preferred. Salary range: \$16,000 to \$20,000 per annum, based on experience. Send curriculum vitae and references to: **Dr. John W. Peterson, Massachusetts General Hospital, Neurosurgical Service, Boston, Mass. 02114.**

POSTDOCTORAL/RESEARCH ASSOCIATE position available beginning in January 1983 in a laboratory which studies the developmental neurobiology of the taste system using neurophysiological, anatomical, and behavioral techniques. Experience in neuroanatomical tracing methods and/or neurophysiology preferred. Salary: \$14,000 to \$16,500 per year, depending upon experience. Applicants should send curriculum vitae and three letters of recommendation to:

**Dr. Robert M. Bradley
Department of Oral Biology
University of Michigan
Ann Arbor, Mich. 48109**

A nondiscriminatory, Affirmative Action/Equal Opportunity Employer.

POSTDOCTORAL RESEARCH ASSOCIATE—Position is available immediately to work on receptors for gonadotropins, prostaglandins, and epidermal growth factor. Candidates with experience in one or more of the following areas will be considered: monoclonal antibody production; protein chemistry and synthesis; prostaglandin biosynthesis and metabolism; molecular biology. Send curriculum vitae and three letters of recommendation to: **Dr. Ch. V. Rao, Department of Obstetrics/Gynecology, 436 B, MDR Building, University of Louisville, Louisville, Kentucky 40292.**

PRE- AND POSTDOCTORAL CANDIDATES. Offering interested individuals pre- and postdoctoral training in programs addressing basic biological reactions in pathology and structural and mechanical properties of diseased tissues. Areas of study include tissue ultrastructure, biomaterials and biomechanics, immunopathology, and tumor virology. Additional information may be obtained from: **Dr. F. H. Silver, Graduate Program Committee, Department of Pathology, UNIVERSITY OF MEDICINE AND DENTISTRY OF NEW JERSEY—Rutgers Medical School, P.O. Box 101, Piscataway, New Jersey 08854. An Equal Opportunity/Affirmative Action Employer, M/F.**

POSITIONS OPEN

POSTDOCTORAL/RESEARCH ASSOCIATES. Two positions in environmental health sciences available immediately at laboratory affiliated with Yale University. Project deals with characterization and modeling of indoor air contaminants and their effects on health and comfort. Send curriculum vitae and names of three references to: **Dr. William S. Cain, John B. Pierce Foundation Laboratory, 290 Congress Avenue, New Haven, Conn. 06519. An Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL RESEARCH ASSOCIATE to study regulation of nitrite reduction. Qualified applicants must have a Ph.D. in biochemistry or a plant science and a minimum of 1 year of research experience with nitrite reductase and familiarity with immunological techniques, enzyme quantification, and in vitro protein synthesis. Salary for the 12-month, full-time position is \$15,000. Applicants should submit curriculum vitae and three letters of reference before 3 December 1982 to: **Oklahoma State Employment Service, Job Number 090102, 300 North Crawford, Norman, Okla. 73070; telephone: 405-364-2505.**

The **DEPARTMENT OF PSYCHOLOGY** of the University of Minnesota contemplates a faculty position opening in the broad area of **experimental cognitive science** for appointment in September 1983, and invites applications. The appointment will be with tenure at either the associate professor or professor rank, depending upon the candidate's level of career accomplishment. Candidates should have primary interests in one or more of the following areas: (i) psychology of language; (ii) artificial intelligence and/or quantitative modeling approaches to human cognition; (iii) problem-solving, decision-making, choice behavior, and human reasoning; (iv) structure of human memory; (v) action systems/perceptual-motor behavior; and (vi) biochemical/neurological studies of human cognition. Candidates are expected to have an active research program in their area of specialization and contribute to the research training of graduate students. Teaching responsibilities will involve courses at the undergraduate level, the undergraduate/graduate level, and the graduate level, with these courses compatible with the individual's interests and expertise. Salary level is competitive and will depend on qualifications and experience. *The University of Minnesota is an Equal Opportunity Educator and Employer and specifically invites and encourages applications from women and minorities.*

Candidates should submit curriculum vitae, three letters of reference, three representative publications, and a statement of long-term research interests to: **Search Committee in Cognitive Science, Department of Psychology, n218 Elliott Hall, 75 East River Road, University of Minnesota, Minneapolis, Minnesota 55455.** Applications must be received by 29 January 1983.

REPRODUCTIVE ENDOCRINOLOGIST

The Department of Obstetrics and Gynecology, The University of Texas Health Science Center at Houston, invites applications for a tenure-track position beginning 1 September 1983. Candidates with at least 2 years of postdoctoral experience with good publication records and demonstrated ability to conduct an active research program in molecular endocrinology are preferred. The successful candidate will be expected to generate his/her own research funds and direct an active hormone assay facility. Salary and rank are negotiable. Applicants should submit, by 1 January 1983, detailed curriculum vitae, three letters of recommendation, and a description of their research interests to: **Dr. Don P. Wolf, Department of Obstetrics and Gynecology, The University of Texas Medical School at Houston, 6431 Fannin, Suite 3270, Houston, Texas 77030. The University of Texas is an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply.**

SENIOR RESEARCH BIOCHEMIST with Ph.D. degree in chemistry or biochemistry and at least 8 years of experience with Type IV collagen peptide purification, amino acid sequencing, and proven supervisory skills. **RESEARCH ASSOCIATE** must possess a Ph.D. degree in chemistry or biochemistry and at least 3 years of postdoctoral experience in collagen amino acid sequencing, characterizing Type V collagen, and basement membrane related collagens HPLC experience desired. Send curriculum vitae, including bibliography, salary requirement, and history, to: **Lorene Pickett, 1124 West Carson Street, C-3, Torrance, Calif. 90502.**

POSITIONS OPEN

Position in the nontenured track of **RESEARCH ASSISTANT PROFESSOR** in the Department of Pathology and Laboratory Medicine (Division of Neuropathology).

Candidates should have a M.D. or Ph.D. degree and ongoing research in ligand-receptor interactions in the central nervous system as they apply to transport and mechanisms of actions of hormones, growth factors, and neurotransmitters. Opportunities to perform research within a multidisciplinary environment of neuropathobiology. Candidates must be able to support their own research. *The University of Pennsylvania is an Equal Opportunity Affirmative Action Employer.*

Applicants should write to:

**Dr. Nicholas K. Gonatas
447 Johnson Pavilion/G2
University of Pennsylvania School of Medicine
Philadelphia, Pa. 19104**

RESEARCH ASSOCIATE. Department of Computer Science. To study and evaluate the mental models and their roles in programming languages and supervise research in software psychology and algebra problem-solving. The candidate will be responsible for the design of new experimental techniques that can be used to tap into underlying knowledge and in conducting and analyzing the experimental data. Candidates must have a strong cognitive science background as well as extensive experience in cognitive simulations of human behavior. Ph.D. in cognitive psychology is required as is proven experience in software psychology and psycholinguistics. At least one year of postdoctoral training in cognitive science is also required. Full-time position with salary of \$22,700 per year. Interested applicants should send their résumés to: **Job Service Technical Unit, State Labor Department, Hartford, Conn. 06115, and refer to J.O. number 216028.**

RESEARCH ASSOCIATE/BIOCHEMISTRY

Ph.D. degree in biochemistry required with special experience in fat metabolism to conduct research in perinatal biology. Position available 1 December 1982. Send curriculum vitae to: **William Oh, M.D., Women and Infants Hospital, 50 Maude Street, Providence, Rhode Island 02908.**

TWO RESEARCH ASSOCIATE/POSTDOCTORAL. Immediate openings for recent Ph.D.'s in endocrinology or reproductive biology to work on colon cancer or human endometrium. Experience in one or more of these areas preferred: membrane and cytosolic hormone receptors, chemical carcinogenesis, mRNA, proteases, or in vitro immune systems. Send curriculum vitae and names of three references to: **Dr. Sharad Joshi or Dr. Herbert Jacobson, Department of Obstetrics/Gynecology, Albany Medical College, Albany, N.Y. 12208. Equal Opportunity/Affirmative Action Employer.**

RESEARCH ASSOCIATE

A postdoctoral position available to investigate Sertoli cell-germ cell interaction. Studies will include investigation of cytoskeleton cell membranes and regulation of biochemical pathways. Send curriculum vitae and names of three references to: **Dr. Peter Hall, c/o Personnel Office, Worcester Foundation for Experimental Biology, 222 Maple Avenue, Shrewsbury, Mass. 01545.**

An Equal Opportunity/Affirmative Action Employer, M/F/H

RESEARCH SCIENTIST—ENVIRONMENTAL HEALTH. To design and conduct advanced research projects in health risk assessment of hazardous environmental agents. Salary: \$21,673 to \$28,752. Excellent benefits. M.P.H. or M.S. degree in environmental health, with specialization (10 semester or 15 quarter credits) in air pollution, epidemiology, or toxicology and analytical research or planning experience in a comprehensive program of study. For application, telephone: **612-623-5064** or write: **Minnesota Department of Health, Room 242B, 717 Delaware Street, SE, Minneapolis, Minn. 55440.**

SENIOR ANATOMIST at the associate professor or professor level. Tenured or tenure-track. Must have an established research program in neurosciences or cell biology and a good publication record. Send curriculum vitae to:

**Dr. Richard G. Hibbs
Department of Anatomy
Louisiana State University Medical Center
P.O. Box 33932
Shreveport, La. 71130
Equal Opportunity Employer**

Research & Development AAAS Report VII

The Federal Budget-FY 1983 Impact and Challenge

Willis H. Shapley, Albert H. Teich, and Jill P. Weinberg

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POSITIONS OPEN

REPRODUCTIVE PHYSIOLOGIST UNIVERSITY OF WISCONSIN-MADISON

Applications are invited for a position as assistant professor in the Department of Meat and Animal Science, University of Wisconsin-Madison. The position will be 60 percent research and 40 percent teaching. Responsibilities will be to conduct innovative research in mammalian reproductive biology and to participate in teaching undergraduate and graduate courses in reproductive physiology. Candidates must have a Ph.D. degree with emphasis in reproductive physiology or its supporting disciplines; postdoctoral training is preferred. Applications are due 15 January 1983. Applicants should send résumé and three letters of reference to: **Robert G. Cassens, Chairman, Department of Meat and Animal Science, 1675 Observatory Drive, University of Wisconsin, Madison, Wisconsin 53706.** The University of Wisconsin provides Equal Opportunities in Programs and Employment.

RESEARCH SCIENTIST—Seeking someone to join a team of 11 research scientists engaged in the study of African swine fever virus. Duties include the testing of antiviral monoclonal antibodies for activity in neutralization tests, antibody-dependent complement lysis and cell-mediated lysis of infected cells, and in vivo passive protection tests. Antibodies having activity in these tests will be used to purify viral antigens that will be tested for their ability to induce active immunity in swine. The candidate must have skills in virology and immunology, including immunochemistry and cell-mediated immunity. Training in viral pathogenesis, biochemistry, and monoclonal antibodies will be useful. Salary: approximately \$23,500 per year. Send résumé to: **Dr. Jerry Callis, Plum Island Animal Disease Center, P.O. Box 848, Greenport, Long Island, N.Y. 11944.** Affirmative Action/Equal Opportunity Employer.

THE OHIO STATE UNIVERSITY (OSU) VICE PRESIDENT FOR HEALTH SERVICES

The Ohio State University is seeking nominations and applications for the new position of **Vice President for Health Services.** The vice president will serve as a member of the president's staff and will be directly responsible to the president for implementing University policies which have impact on health services. The vice president will be the chief executive officer for The Ohio State University Hospitals, a large medical center complex consisting of seven buildings housing over 1,000 adult beds, 64 bassinets, and an ambulatory facility now providing 230,000 visits annually. Additionally, the vice president will be responsible for the Health Safety Program, Comprehensive Cancer Center, and Center for Continuing Health Science Education.

Qualifications: Candidates should have a terminal degree; demonstrated academic and professional excellence; have had university teaching, research and academic health services administrative experience; should be able to represent the Office of Health Services in the community, state and nation, through the office of the president.

Salary: commensurate with experience and abilities.

Applications and nominations should be submitted by 15 December 1982 to:

**Calvin M. Kunin, M.D., Chairman
Search Committee, Vice President for Health Services
Department of Medicine
265 Means Hall
1655 Upham Drive
Columbus, Ohio 43210**

An Equal Opportunity/Affirmative Action Institution

ANNOUNCEMENT

NATIONAL SCIENCE FOUNDATION ANNOUNCEMENT

A second special competition for improvements in research facilities at U.S. marine biological laboratories is being held in 1983, with a deadline for submission of proposals of 15 January and announcement of the awards totaling about \$1 million by 1 June 1983. It is expected that the maximum award amount will be \$100,000 per institution. For details, contact: **Dr. James C. Tyler, Biological Research Resources Program (Room 1140), National Science Foundation, Washington, D.C. 20550.** Telephone: 202-357-7475.

CONFERENCE

INTERNATIONAL CONFERENCE ON INSECT NEUROCHEMISTRY AND NEUROPHYSIOLOGY (ICINN). The Conference will be presented 1 to 3 August 1983 by the University of Maryland at College Park under government and industry sponsorship. The program will include invited speakers, contributed papers, panel discussion, and a techniques workshop. Attendance will be limited to 200 participants. Topics will consider biogenic amines; synapse pharmacology; neurosecretory cell regulation; neuropeptide chemistry; neuroendocrine regulation of development; structure and organization of the nervous system; environmental influences, and so forth. A tentative list of speakers includes K. Davey (Canada), J. deWilde (Netherlands), S. Madrell (England), W. Mordue (Scotland), I. Orchard (Canada), Y. Pinchon (France), B. Sharrer (United States), and J. Treherne (England). Submit requests for further information to: **ICINN, Insect Reproduction Laboratory, USDA, ARC-East-306, Beltsville, Maryland 20705.**

PROGRAM

CAREER CHANGE OPPORTUNITY

This unique program offers the candidate with an earned doctorate in the sciences the opportunity to obtain a doctor of optometry (O.D.) degree in two calendar years. Employment opportunities exist in private practice, industry, education, and research. Contact: **The Dean of Admissions, The New England College of Optometry, Room 1101, 424 Beacon Street, Boston, Mass. 02115.**

GRADUATE STUDY

GRADUATE STUDY IN PATHOBIOLOGY—Applications are invited for graduate study in pathobiology leading to the degree of Ph.D. This program offers training in cellular and molecular aspects of human disease. Students may specialize in a variety of disciplines including, for example, cell biology, biochemistry, immunology, cancer biology, genetics, and microbiology. Emphasis is placed upon preparing graduates to work and carry out research in the biomedical sciences. Graduate students with degrees in the sciences, as well as those presently holding M.D. degrees, are encouraged to apply. Some stipends are available. Deadline for application is 1 June 1983. Contact: **L. S. Kenny, Department of Laboratory Medicine and Pathology, Box 198 Mayo, University of Minnesota, Minneapolis, Minn. 55455.** Telephone: 612-376-3083.

FELLOWSHIPS

POSTDOCTORAL FELLOWSHIPS (M.D. and Ph.D.) are available in clinical and basic research aspects of endocrinology, metabolism, and clinical nutrition. Specific areas of interest include: calcium and bone metabolism, neuroendocrinology, carbohydrate metabolism, lipid and lipoprotein metabolism, nutrition, pituitary physiology, mechanisms of hormone secretion, and thyroid physiology. Funding is for U.S. citizens through the National Institutes of Health. **Dr. Eric Orwoll, Division of Endocrinology, Metabolism and Clinical Nutrition, Oregon Health Sciences University, Portland, Oregon 97201.**

The Division of Geological and Planetary Sciences at the California Institute of Technology expects to offer **POSTDOCTORAL RESEARCH FELLOWSHIPS** in one or more of the following areas: geology, geophysics, geochemistry, and planetary science. Interested persons are asked to contact: **Dr. Barclay Kamb, Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, Calif. 91125.** An Equal Opportunity/Affirmative Action Employer.

POSTDOCTORAL RESEARCH FELLOWSHIP. One full-time postdoctoral position in **COMPARATIVE MOLECULAR GENETICS** immediately available to study organization of ribosomal genes in *Equidae*. Experience in Southern blotting, molecular cloning, and related techniques desirable. Send letter, curriculum vitae, and references to: **Dr. Oliver Ryder, Research Department, San Diego Zoo, Box 551, San Diego, Calif. 92112.** An Equal Opportunity/Affirmative Action Employer.

FELLOWSHIPS

IMPERIAL CANCER RESEARCH FUND (ICRF) MEDICAL ONCOLOGY UNIT, EDINBURGH RESEARCH FELLOWSHIPS

Applications are invited for a 3-year postdoctoral appointment for a biochemist with experience in protein and/or nucleic acid biochemistry to work with **Dr. C. R. Wolfe** on the control and characterization of drug metabolizing enzyme systems in man relating to cancer chemotherapy. Candidates should be free to take up post as soon as possible after 1 January 1983. Salary range: £8085 to £10,240.

Interested applicants are invited to submit their full curriculum vitae, with names of two referees, to: **Dr. C. R. Wolfe, ICRF Medical Oncology Laboratory, Western General Hospital, Edinburgh, EH4 2XU, Scotland.**

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