

conifer forests, the vegetation of coastal southeastern America, or regional monographic synthesis will need. It is one thing to comment on what the authors might have done for the Pine Barrens; it is another to do it if the necessary research has not yet been done, as appears to be the case here. The volume implicitly identifies the unique opportunities that remain for work on the Pine Barrens of New Jersey.

ORIE L. LOUCKS

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Developmental Biology

Determinants of Spatial Organization. Papers from a symposium, Madison, Wis., June 1978. STEPHEN SUBTELNY and IRWIN R. KONIGSBERG, Eds. Academic Press, New York, 1979, xxiv, 334 pp., illus. \$24.

This volume is the proceedings of a symposium that focused on cytoplasmic localization of determinative factors in early embryonic development, maternal-effect mutants of development, and pattern formation and regulation in later stages of development. The book has a good balance between data and theory and covers a spectrum of topics of sufficient maturity and relatedness to be coherent. The contributions are in general well conceived and clearly presented. Too few concentrate on each of the three major topics to provide a truly thorough picture of the current state of each, but sufficient material on each topic is presented to make this a useful volume.

A scholarly review by Frankel is pivotal. Frankel discusses pattern regulation in *Tetrahymena* and demonstrates convincingly that both global long-range ordering and short-range inductive phenomena can be found in single-cell ciliates and directly parallel pattern regulation in multicellular developmental fields. Thus similar principles of pattern regulation may apply to the single-cell egg. Wolk describes the phenomenology and cellular physiology underlying heterocyst pattern formation in filamentous blue-green algae such as *Anabaena*. Campbell has recently succeeded with hydra in forming clones of organisms comprised solely of epithelial cells. Such epithelial hydra undergo essentially normal growth, budding, and pattern regulation after surgical intervention, a finding that suggests to Campbell that pattern control rests primarily in epithelial cells and may often be regulated by mechanical attributes rather than chemical gradi-

ents. Lawrence and Morata provide a brief description of the effects of homoeotic mutants in *Drosophila* in relation to the compartmental hypothesis.

Bryant reviews the data on the imaginal disks of *Drosophila* that support the hypothesis that positional information is supplied by an identical polar coordinate system in each disk. This model has been used with considerable success in interpreting pattern regulation in insects and secondary developmental fields in amphibians, but it has not been applied to primary positional information in the egg itself. The alternative hypothesis, that positional information in the *Drosophila* egg is supplied by monotonic gradients in a Cartesian coordinate system, is discussed by Nüsslein-Volhard using evidence from the maternal mutants *bicaudal* and *dorsal*. In *bicaudal*, most embryos are normal, that is, have a mirror-symmetric double abdomen. Nüsslein-Volhard suggests that a normal anterior-posterior monotonic gradient has a second stable symmetrical shape with two peaks. Kalthoff has induced a similar double abdomen in *Smittia* by ultraviolet irradiation of the anterior egg pole and suggests in his paper an independent anterior-posterior decision process and a metamerization process.

Thoughtful papers by Dohmen and Verdonk, Whittaker, Freeman, Quantrano *et al.*, Hirsh, and Mahowald *et al.* discuss the localization of cytoplasmic or cortical determinants in eggs and how the determinants might arise. Dohmen and Verdonk describe dorsal determinants in molluscan eggs. Whittaker reviews the evidence for determinants in ascidian eggs, in particular experiments in which early cleavage planes are altered, leading specific blastomeres to incorporate cytoplasm usually segregated elsewhere. Freeman describes data showing that various determinants are progressively localized during the early cleavage divisions of *Cerebratulus* eggs rather than being definitively prelocalized by fertilization. Quantrano and colleagues discuss axis fixation in *Fucus* in terms of electrical potential gradients or contractile mechanisms to move macromolecular determinants. Hirsh has collected temperature-sensitive maternal mutants of *Caenorhabditis elegans* that disrupt the geometry of early cleavage but has not yet found evidence that resulting cell linkages are altered. A paper by Mahowald and colleagues summarizes the efforts to find the molecular basis of localized pole cell determinants in *Drosophila*.

Among the most provocative papers is that by Brothers, who has analyzed the

recessive maternal-effect *o* mutant of *o*-otl. Female homozygotes produce eggs that block during gastrulation. Exposure of mutant *o*⁻ nuclei to wild-type egg cytoplasm or nucleoplasm corrects the defect. Such *o*⁻ nuclei can sustain normal development in back transplantations to enucleate mutant *o*⁻ eggs for over 30 divisions. Brothers's results establish that *o*⁻ nuclei can be rescued to a stably heritable *o*⁺ state despite repeated exposure to *o*⁻ cytoplasm. The analysis of cytoplasmic determinants has generally assumed that nuclei remain fully responsive to cytoplasmic factors. In many species, nuclei do remain totipotent after transplantation to enucleate eggs. However, totipotency may require features of early cleavage divisions. Progressive determination may be associated with the assumption of progressively more stable nuclear states that, once established, are resistant to signals for a wide variety of alternative developmental pathways. Such phenomena would be of deep interest in their own right and would complicate the analysis of localized determinants.

The volume is well produced, with extensive references for each paper and a clear subject index. Despite the limitations of the symposium format, this is a sound and useful book.

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Books Received

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Air Pollution Chemistry. J. D. Butler. Academic Press, New York, 1979. viii, 408 pp., illus. \$52.50.

The Amateur Astronomer. Antonín Růkl. Translated from the Czech edition. John Gribbin, Consultant Editor. Octopus Books, London, 1979 (U.S. distributor, Mayflower Books, New York). 184 pp., illus. \$9.95.

Beryllium Science and Technology. Vol. 1. Donald Webster and Gilbert J. London, Eds. Plenum, New York, 1979. xiv, 334 pp., illus. \$35.

The Biological Basis of Schizophrenia. Gwynneth Hemmings and W. A. Hemmings, Eds. University Park Press, Baltimore, 1979. xii, 272 pp., illus. \$29.50.

Biological Identification. Richard J. Pankhurst. University Park Press, Baltimore, 1978. viii, 104 pp., illus. Paper, \$9.95.

Complex Carbohydrates of Nervous Tissue. Richard U. Margolis and Renée K. Margolis, Eds. Plenum, New York, 1979. xviii, 402 pp., illus. \$39.50.

A Complex Variable Approach to the Analy-

(Continued on page 521)

BOOKS RECEIVED

(Continued from page 493)

sis of Linear Multivariable Feedback Systems. Ian Postlethwaite and Alistair G. J. MacFarlane. Springer-Verlag, New York, 1979. iv, 178 pp., illus. Paper, \$9.80. Lecture Notes in Control and Information Sciences, vol. 12.

District Heating. Thermal Generation and Distribution. A Practical Guide to Centralised Generation and Distribution of Heat Services. C. Mackenzie-Kennedy. Pergamon, New York, 1979. xii, 198 pp., illus. \$27.50. International Series in Heating, Ventilation and Refrigeration, vol. 13.

Dynamical Critical Phenomena and Related Topics. Proceedings of a conference, Geneva, Apr. 1979. Charles P. Enz, Ed. Springer-Verlag, New York, 1979. xii, 392 pp., illus. Paper, \$19.50. Lecture Notes in Physics, vol. 104.

Environmental Physiology III. David Robertshaw, Ed. University Park Press, Baltimore, 1979. xii, 376 pp., illus. \$29.50. International Review of Physiology, vol. 20.

The Epstein-Barr Virus. M. A. Epstein and B. G. Achong, Eds. Springer-Verlag, New York, 1979. xvi, 460 pp., illus. \$66.

The Extra-Intracranial Bypass Operation for Prevention and Treatment of Stroke. Gerhard Kletter. Springer-Verlag, New York, 1979. xii, 168 pp., illus. \$49.

Federal Regulation and Chemical Innovation. Papers from a symposium, Miami Beach, Sept. 1978. Christopher T. Hill, Ed. American Chemical Society, Washington, D.C., 1979. xvi, 200 pp., illus. \$24.25. ACS Symposium Series, 109.

Female and Male Climacteric. Current Opinion 1978. Papers from a congress, Jerusalem, June 1978. P. A. van Keep, D. M. Serr, and R. B. Greenblatt, Eds. University Park Press, Baltimore, 1979. xvi, 146 pp., illus. \$14.95.

Financing of Health Care. Lewis E. Weeks, Howard J. Berman, and Gerald E. Bisbee, Jr., Eds. Health Administration Press, Ann Arbor, Mich., 1979. x, 540 pp., illus. Cloth, \$24; paper, \$14. Reprinted from *Inquiry*.

Glycoconjugate Research. Vol. 2. Proceedings of a symposium, Woods Hole, Mass., Sept. 1977. John D. Gregory and Roger W. Jeanloz, Eds. Academic Press, New York, 1979. xx + pp. 573-1104, illus. \$29.50.

Graph-Grammars and Their Application to Computer Science and Biology. Papers from a workshop, Bad Honnef, Germany, Oct. 1978. Volker Claus, Hartmut Ehrig, and Grzegorz Rozenberg, Eds. Springer-Verlag, New York, 1979. viii, 478 pp., illus. Paper, \$21.30. Lecture Notes in Computer Science, vol. 73.

Group Theoretical Methods in Physics. Papers from a meeting, Austin, Tex., Sept. 1978. W. Beiglböck, A. Böhm, and E. Takasugi, Eds. Springer-Verlag, New York, 1979. xiv, 540 pp. Paper, \$23. Lecture Notes in Physics, vol. 94.

Handbook of Pediatric Cardiology. L. Jerome Krovetz, Ira H. Gessner, and Gerold L. Schiebler. University Park Press, Baltimore, ed. 2, 1979. xii, 476 pp., illus. \$32.50.

Hearing Assessment. William F. Rintelmann, Ed. University Park Press, Baltimore, 1979. xvi, 616 pp., illus. \$26.95. Perspectives in Audiology Series.

International Drug Use. Gregory A. Austin, Mary A. Macari, and Dan J. Lettieri, Eds. National Institute on Drug Abuse, Rockville, Md., 1978 (available from the Superintendent of Documents, Washington, D.C.). xxvi, 202 pp. Paper, \$4.25. Research Issues, 23.

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A Manual for Bird Watching in the Americas. Donald S. Heintzelman. Universe Books, New York, 1979. 256 pp., illus. + plates. \$17.95.

Marine Gravity. Peter Dehlinger. Elsevier, New York, 1978. xii, 322 pp., illus. \$70.75. Elsevier Oceanography Series, 22.

Marine Mycology. The Higher Fungi. Jan Kohlmeyer and Erika Kohlmeyer. Academic Press, New York, 1979. xiv, 690 pp., illus. \$59.50.

Material Sciences in Space. Sciences des Matériaux dans l'Espace. Proceedings of a symposium, Genoble, Apr. 1979. European Space Agency, Paris, 1979. xxiv, 442 pp., illus. Paper, 120 F. ESA SP-142.

Mathematical Foundations of Computer Science 1979. Proceedings of a symposium, Olomouc, Czechoslovakia, Sept. 1979. J. Bečvář, Ed. Springer-Verlag, New York, 1979. x, 580 pp. Paper, \$26.40. Lecture Notes in Computer Science, vol. 74.

Measurement of Levels of Health. Walter W. Holland, Johannes Ipsen, and Jan Kostrzewski, Eds. World Health Organization Regional Office for Europe, Copenhagen, 1979 (U.S. distributor, WHO Publications Centre USA, Albany, N.Y.). viii, 456 pp., illus. Paper, \$28.75. WHO Regional Publications European Series No. 7.

Medicine's New Technology. A Career Guide. Janet Zhun Nassif. Arco, New York, 1979. xii, 224 pp., illus. \$8.95.

Pulmonates. Vera Fretter and J. Peake, Eds. Academic Press, New York, 1979. Vol. 2A, Systematics, Evolution and Ecology. xii, 540 pp., illus. \$50.75. Vol. 2B, Economic Malacology with Particular Reference to *Achatina fulica*. A. R. Mead. x, 150 pp., illus. \$25.20.

Qualitative Aspects of Large Scale Systems. Developing Design Rules Using APL. O. I. Franksen, P. Falster, and F. J. Evans. Springer-Verlag, New York, 1979. xii, 120 pp., illus. Paper, \$9. Lecture Notes in Control and Information Sciences, vol. 17.

The Reverent Skeptic. A Critical Inquiry into the Religion of Secular Humanism. J. Wesley Robb. Philosophical Library, New York, 1979. xiv, 222 pp. \$12.50.

Rocks and Rock Minerals. Richard V. Dietrich and Brian J. Skinner. Wiley, New York, 1979. xiv, 320 pp., illus. \$11.95.

Schwartz Spaces, Nuclear Spaces and Tensor Products. Yau-Chuen Wong. Springer-Verlag, New York, 1979. viii, 418 pp. Paper, \$19.50. Lecture Notes in Mathematics, vol. 726.

Science and Technology for Development. The Role of U.S. Universities. Robert P. Morgan with Ellen E. Irons, Eduardo A. Perez, Theodore N. Soule, and Ava K. Fried. Pergamon, New York, 1979. xxvi, 402 pp. \$32. Pergamon Policy Studies.

Scientific Basis for Nuclear Waste Management. Vol. 1. Proceedings of a symposium, Boston, Nov. 1978. Gregory J. McCarthy and six others, Eds. Plenum, New York, 1979. xviii, 564 pp., illus. \$49.50.

Sensory Processing in the Brain. An Exercise in Neuroconnective Modeling. Dean E. Wooldridge. Wiley-Interscience, New York, 1979. xiv, 378 pp., illus. \$25.

The Weaponsmakers. Personal and Professional Crisis during the Vietnam War. Jeffrey M. Schevitz. Schenkman, Cambridge, Mass., 1979. vi, 192 pp. Cloth, \$14.50; paper, \$7.95.

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Position available: Ph.D. **ANALYTICAL BIOCHEMIST** in University of Arizona Cancer Center. Call or write: **David Alberts, M.D., Department of Medicine, Arizona Health Sciences Center, Tucson, Arizona 85724; telephone: 602-626-7685. The University of Arizona is an Equal Opportunity/Affirmative Action Employer.**

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The Department of Pathology seeks an individual with at least a master's degree to manage its autopsy service. Expertise in gross human anatomy essential. Duties include assisting with autopsies, performing sophisticated anatomic studies, and maintaining teaching museum and tissue library. Substantial time is allocated for research and educational activities. Position available 1 July 1980. Starting salary: up to \$17,528 per annum, depending on qualifications. Send résumé and names of three references by 1 June 1980 to: **Dr. Gary Mierau, Department of Pathology, The Children's Hospital, 1056 East 19 Avenue, Denver, Colo. 80218.**

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Major responsibilities: Coordinate, direct, and participate in the teaching of upper-level general physiology; teach a graduate course in specialty; direct M.S. and undergraduate research; and develop an active research program with potential for external funding.

Qualifications: Ph.D. with postdoctoral research experience; research interests in an area such as neurophysiology, muscle physiology, or membranes; and commitment to quality teaching and research.

Send curriculum vitae, a statement of research and teaching interests, and names and addresses of three references by 20 May to:

Dr. Joseph A. J. Orkiszewski
Chairman, Department of Biology
Villanova University
Villanova, Pa. 19085

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ASSISTANT PROFESSOR, PHARMACOLOGY— Academic year, tenure-track, available 1 August 1980. Ph.D. in pharmacology required. Pharmacy license highly desirable. Successful applicant will participate in teaching undergraduate and graduate courses in pharmacology and conduct research in the discipline. Interested applicants should send a letter of application, curriculum vitae, transcripts of all college work, and three letters of reference by 2 June 1980 to: **Dr. Lydia J. Fontenelle, Chairperson, Pharmacology Search Committee, College of Pharmacy, Idaho State University, Pocatello, Idaho 83209. Idaho State University is an Equal Opportunity/Affirmative Action Employer.**

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ANATOMIST

Applications are invited for a tenure-track position at the assistant professorship level. Candidates must have a strong fundable research program with medical school teaching experience in histology and gross anatomy. Salary commensurate with training and experience. Send curriculum vitae and names and addresses of three references to: **Dr. Charles E. Blevins, Chairman, Department of Anatomy, Indiana University School of Medicine, 1100 West Michigan Street, Indianapolis, Indiana 46223.**

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Dr. William Cooper
Department of Zoology
Michigan State University
East Lansing, Mich. 48824

MSU is an Affirmative Action/Equal Opportunity Institution.

The Program in Social Ecology, University of California at Irvine, is recruiting an **ASSISTANT PROFESSOR** (tenure-track) who specializes in the impact of regulatory practices on health. Supporting research and teaching capabilities in one or both of the following two areas would strengthen an individual's candidacy: (i) the assessment and analysis of comparative health risks associated with different options; and (ii) the use of public health information in public and corporate decision-making. The successful candidate is most likely to have the doctorate in public health, but could come from another relevant discipline. Social Ecology is an interdisciplinary research and teaching unit offering the B.A., M.A., and Ph.D. Its 25 faculty members include community, developmental, and environmental psychologists; sociologists; criminologists; planners; lawyers; and public health specialists who share a common interest in multidisciplinary approaches to the study of pressing social and environmental problems. Candidates should send curriculum vitae and a brief letter, and should request letters from three referees who can evaluate the candidate's research and teaching competencies. Address materials to: **Chair, Search Committee on Regulations and Health, Program in Social Ecology, University of California, Irvine, California 92717. Apply at once, preferably before 20 May 1980. Review of applications received beyond that date cannot be guaranteed. An Affirmative Action Employer.**

Psychology Department, Loyola University of Chicago, has a 1-year (nontenure) position as **ASSISTANT PROFESSOR** to teach physiological, experimental psychology. Parham Hearing Institute has two positions: (i) **ASSISTANT PROFESSOR**—research interests in addition, teach one course per semester; (ii) **RESEARCH ASSOCIATE**—interests in pitch perception. Send curriculum vitae, statement of interests, and three letters of reference to: **Richard R. Fay, Psychology Department, Loyola University, 6525 North Sheridan Road, Chicago, Ill. 60626. Affirmative Action/Equal Opportunity Employer.**

ASSISTANT ADJUNCT PROFESSOR OF TOXICOLOGY. Ph.D. in toxicology, pharmacology, or related field. The University of California, Davis, Laboratory for Energy-Related Health Research, is seeking a Ph.D. toxicologist for studies of aerosol properties, the deposition and retention of inhaled and intratracheally instilled particles of potentially toxic materials, and related inhalation toxicology. This team research position is available immediately at the academic research level equivalent to assistant professor. Candidate should have a background that includes aerosol generation and characterization, respiratory tract anatomy and lung physiology, methods for intratracheal instillation of potentially toxic materials, and methods for exposing experimental animals to aerosols and gases. Some experience beyond the Ph.D. is required. Adjunct teaching appointment is available. Send curriculum vitae, transcript, and the names of three references to: **Dr. Marvin Goldman, Laboratory for Energy-Related Health Research, University of California, Davis, Calif. 95616. Applications will be accepted through 16 May 1980 or until the position is filled. The University of California is an Affirmative Action/Equal Opportunity Employer.**

POSITIONS OPEN

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Joint appointment (60 percent Cooperative Extension; 40 percent Agricultural Experiment Station, Department of Nematology, University of California, Riverside), to conduct research and extend off-campus educational programs in nematology of annual crops. Headquarters at San Joaquin Valley Agricultural Research and Extension Center, Parlier. Ph.D. with specialty in plant nematology and 2 years of field experience is desired. Available now. Contact: **Personnel Administrator, Cooperative Extension, 331 University Hall, University of California, Berkeley, Calif. 94720.** Closing date: 28 May 1980. Refer to Number 8006.

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ASSISTANT PROFESSOR IN ENOLOGY, CORNELL UNIVERSITY. Research and extension. Require Ph.D. with enology training and/or experience. Send for position announcement, or send application, transcripts, and references to: **W. B. Robinson, Chairman, Department of Food Science and Technology, New York State Agricultural Experiment Station, Geneva, N.Y. 14456.** *Cornell is an Equal Opportunity Employer.*

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- 3) **Assistant/associate professor(s)** with backgrounds in electrical or computer engineering areas such as microprocessors, digital design, electronics, digital communications, digital control, computer systems, and so forth, to teach courses in electrical engineering and biomedical instrumentation.

Part-time teaching and collaborative research opportunities are also available. Candidates should send résumé, list of publications, and names of at least four references to: **Dr. Robert J. McLaughlin, Chairman, Biomedical Engineering Search Committee, Boston University College of Engineering, 110 Cummings Street, Boston, Mass. 02215.** *Boston University is an Affirmative Action/Equal Opportunity Employer.*

BOTANIST

VASCULAR PLANT SYSTEMATIST. Applications are invited for a tenure-track assistant/associate professorship available September 1980. Qualifications include: (i) Ph.D., (ii) strong teaching ability in field botany and biological systematics, (iii) ability and desire to participate in general botany and general biology courses, (iv) demonstrated research potential, and (v) desire to expand and supervise a vascular herbarium. Submit curriculum vitae along with statement of teaching and research experience and interests by 23 May 1980 to: **Dr. Gilbert D. Brum, Biological Sciences Department, California State Polytechnic University, Pomona, Pomona, California 91768.**

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2 MAY 1980

POSITIONS OPEN

ASSOCIATE SPECIALIST/ASSISTANT RESEARCH BIOCHEMIST/MICROBIOLOGIST POSITION available May 1980 for 1 year (a possible extension to 4 years) to study the mechanism of silicate transport in diatoms. Ph.D. in biochemistry/microbiology. Research experience in microbiology, biochemistry of membrane transport, ion transport in membrane vesicles, membrane protein purification, reconstitution, isolation of ionophores. Familiarity in silicon biochemistry and silicate transport. Salary: \$19,584 or \$19,700. Send curriculum vitae, reprints, and three letters of recommendation to: **Dr. B. E. Volcani, Scripps Institution of Oceanography, University of California, San Diego, La Jolla, Calif. 92093.** *Affirmative Action/Equal Opportunity Employer.*

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Applicants should provide curriculum vitae, a short statement of the proposed research program, and the names of at least three scientists willing to write letters of recommendation.

Send applications to:

**Dr. Gene M. Brown
Chairman of Search Committee and
Head, Department of Biology
Building 56, Room 511
Massachusetts Institute of Technology
77 Massachusetts Avenue
Cambridge, Mass. 02139**

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BIOCHEMISTRY/MICROBIOLOGY FACULTY POSITION. The University of Wisconsin-Madison invites applications for a tenure-track position in pharmaceutical biochemistry to begin September 1980 within the School of Pharmacy. Rank and salary are open, but preference will be given to a more experienced candidate engaged in the general area of antibiotic research (mode of action, genetics of antibiotic producing organisms, mechanism of biosynthesis, and so forth). The successful candidate will be expected to teach at the undergraduate and graduate levels and to undertake a vigorous program of research. Applicants should send curriculum vitae, a list of publications, and three recommendation letters to:

**Dr. Dexter Northrop
School of Pharmacy
University of Wisconsin-Madison
425 North Charter Street
Madison, Wis. 53706**

Applications from minority group members and women are particularly welcome. Closing date for receipt of applications is 16 May 1980. *The University of Wisconsin-Madison is an Equal Opportunity/Affirmative Action Employer.*

ELECTRON MICROPROBE SPECIALIST. The Department of Geological Sciences, Harvard University, seeks a person experienced in analytical chemistry, materials science, or related fields who will assume responsibility for maintaining its electron microprobe laboratory. This person will also be expected to develop software for analytical procedures and data reduction, and to take part in ongoing research programs in silicate, sulfide, and oxide mineral chemistry. This appointment will be coordinated with the installation of a new CAMECA-MBX microprobe equipped for wavelength and energy dispersive analysis. Desirable starting date is 1 July 1980; annual starting salary ranges from \$16,000 to \$22,000, depending upon background and qualifications. Applicants should send résumé, list of three references, and letter outlining career goals and research interests to: **Dr. R. F. Dymek, Harvard University, Hoffman Laboratory, 20 Oxford Street, Cambridge, Mass. 02138.**

Harvard University is an Equal Opportunity/Affirmative Action Employer.

POSITIONS OPEN

ASSOCIATE DIRECTOR IN LABORATORY ANIMAL MEDICINE IN NEW YORK CITY

Cornell University Medical College in New York City invites applications for the position of **ASSOCIATE DIRECTOR OF THE UNIVERSITY'S RESEARCH ANIMAL RESOURCE CENTER.** The associate director for the Medical College will be based principally in New York City and will be responsible for research animal activities there. He/she will participate jointly, with Rockefeller University, in a resource diagnostic facility. As a member of the University-wide Research Animal Resource Center, the associate director shares diagnostic capabilities, residency and graduate training programs, and collaborative research with Cornell's College of Veterinary Medicine and Graduate School of Arts and Sciences in Ithaca, N.Y.

Applicant should be a D.V.M. and should be Board-certified or eligible in the American College of Laboratory Animal Medicine or Veterinary Pathology (with a special interest in laboratory animals). A Ph.D. in some area of basic science and an interest in independent or collaborative research is desirable. Rank and salary are commensurate with experience. If interested, please submit curriculum vitae to: **Dr. Fred Quimby, Cornell University Medical College, Room A736, 1300 York Avenue, New York, New York 10021.** *Cornell University Medical College is an Equal Opportunity/Affirmative Action Institution.*

BIOCHEMICAL GENETICS OF IMMUNOGLOBULIN PRODUCTION. Postdoctoral position available September 1980. Application of techniques of gene cloning and somatic cell genetics to study the control of immunoglobulin biosynthesis. Apply with résumé and letters of reference to either: **Dr. Marc Shulman or Dr. Nobumichi Hozumi, Department of Medical Biophysics, University of Toronto, 500 Sherbourne Street, Toronto, Ontario, Canada M4X 1K9.**

CARDIOLOGIST—The Division of Cardiovascular Disease in the Department of Medicine at the University of Alabama in Birmingham has available a position at the associate professor level. The position is open to qualified individuals at a senior level fulfilling two criteria. First, the individual must have expertise and an extensive background in cardiovascular research, being able to carry out independent research. Second, the individual must have a firm commitment to teaching programs oriented to medical students, graduate students, and fellows. Apply to: **Division of Cardiovascular Disease, Department of Medicine, University of Alabama Medical Center, Birmingham, Alabama 35294** (attention: **Norma McSweeney**). *An Equal Opportunity/Affirmative Action Employer.* Expiration date for receipt of applications: 15 May 1980.

CHAIRMAN, DEPARTMENT OF MICROBIOLOGY/IMMUNOLOGY

The University of Washington School of Medicine invites nominations and applications for the chairmanship of microbiology/immunology. Criteria for selection will include a nationally recognized research program, interests in basic and health science aspects of microbiology and immunology, concern for excellence in teaching of undergraduate and graduate students, and demonstrated administrative skills. The department is composed of 26 FTE's and has excellent teaching and research facilities. It is located adjacent to the Departments of Biochemistry and Genetics. Send nominations and applications with curriculum vitae and bibliography before 1 July 1980 to:

**Dr. Earl W. Davie
Chairman, Search Committee
Department of Biochemistry, SJ-70
University of Washington
Seattle, Wash. 98195**

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

FACULTY POSITION. Experience in animal virology, cell biology, immunology, or genetics. Required to teach courses to medical and graduate students and to maintain a vigorous research program. Research productivity must be demonstrated. Individual expected to develop graduate courses in a specialized field of interest. Rank and salary dependent on background, experience, and qualifications. Send curriculum vitae, bibliography, and three recommendations by 1 June 1980 to: **Dr. Fred Rapp, Chairman, Department of Microbiology, The Milton S. Eshelby Medical Center, The Pennsylvania State University, Hershey, Pa. 17033.** *An Equal Opportunity/Affirmative Action Employer.*

POSITIONS OPEN

UNIVERSITY OF SOUTHAMPTON, CHAIR OF BIOLOGY. Applications are invited from persons with botanical interests for a chair of biology which will become vacant on the retirement of Professor S. H. Crowdy later this year. Further particulars may be obtained from: **The Secretary and Registrar, The University, Southampton SO9 5NH, England.** Applications (ten copies from applicants in the United Kingdom and one from others) must be submitted before 31 May 1980. Please quote reference: S.

FOOD AND DRUG ADMINISTRATION (FDA) BUREAU OF DRUGS ST. LOUIS, MISSOURI

The National Center for Drug Analysis has an opening for a **CHEMIST** with substantial research experience in instrumental analysis design and application (gas and high-pressure liquid chromatography, ultraviolet, visible, and infrared spectrophotometry, nuclear-magnetic-resonance spectrometry, and so forth), and working knowledge of computer or microprocessor systems. The position involves conducting research on applications and designs of instrumental techniques for the analysis of pharmaceuticals, and applications of computer and microprocessor systems to manipulation of data from and control of analytical instruments. Salary: \$24,703 per annum (GS-12). This position is tentatively scheduled to be filled in August or September 1980. Closing date: 1 June 1980.

To apply, send curriculum vitae, Standard Form 171 (Personal Qualifications Statement), Civil Service Commission Form 1122 (Supplemental Qualifications Statement), and transcripts to:

Steven Park
Food and Drug Administration
Personnel Operations Branch, FB-8
Room 1825
Washington, D.C. 20204

*THIS IS A CIVIL SERVICE POSITION
FDA/An Equal Opportunity Employer*

DIRECTOR—University of California Center for Occupational Health and Safety and **PROFESSOR**, Occupational Medicine, Department of Community and Environmental Medicine, College of Medicine, University of California, Irvine.

The University of California, Irvine, seeks an internationally recognized scholar in the field of occupational health for appointment as director of a developing Center for Occupational Health and Safety. A high level of achievement is required in occupational health-oriented research and teaching as is a strong interest in developing multidisciplinary programs which focus on health hazards in the workplace. The selected candidate shall qualify for a professorship with Academic Senate membership.

Evidence of effective relationships with governmental agencies, labor organizations, and industrial management is highly desirable.

The University of California is an Affirmative Action Employer. Please send curriculum vitae, a brief statement of current research interests, and the names of three or more references to:

Frederick Reines
Chair of Search Committee and Professor of Physics
University of California, Irvine
Irvine, Calif. 92717

DIRECTOR, GERONTOLOGY CENTER

To direct newly created Gerontology Center for Health and Long-Term Care. Must be senior health professional with broad and extensive experience in academic medical center setting in teaching, research, science and/or administration related to health and aging. Must be eligible for senior academic appointment in medical school department. Application deadline: 1 June 1980. Apply to: **Dr. Roy Behnke, Chairman, Gerontology Center Search Committee, University of South Florida Medical Center, 12901 North 30 Street, Tampa, Florida 33612.** *University of South Florida is an Equal Opportunity Employer.*

POSTDOCTORAL RESEARCH available immediately. Ph.D. in physical chemistry with 1 year of postdoctoral experience in molecular mechanisms of anesthesia. Extensive background and experience in statistical mechanics, surface chemistry, and FT NMR necessary. Salary: \$14,000 per year and benefits. Send résumé and three letters of recommendation to: **Dr. K. C. Wong, Department of Anesthesiology, University of Utah, Salt Lake City, Utah 84132.** *Equal Opportunity/Affirmative Action Employer.* Application deadline: 1 October 1980.

POSITIONS OPEN

FACULTY POSITIONS IN PHARMACOLOGY UNIVERSITY OF CALIFORNIA, IRVINE COLLEGE OF MEDICINE

The newly redeveloping Department of Pharmacology of the University of California, Irvine, College of Medicine, invites applications and nominations for five tenure-track or tenured faculty positions. Candidates should be internationally recognized scholars and investigators with demonstrated commitment to medical and graduate education, and should be currently active in one or more of the following fields: biochemical pharmacology, neuropharmacology and neuroendocrinology, immunopharmacology, renal and cardiovascular pharmacology, clinical pharmacology. A Ph.D. in pharmacology or biochemistry or M.D. is required. Level of appointment and salary will be commensurate with achievement and experience.

Curriculum vitae and names of three references should be sent before 15 June 1980 to: **Dr. Larry Stein, Chair, Department of Pharmacology, University of California, Irvine, California 92717.** *The University of California is an Equal Opportunity Employer.*

Full-time **FACULTY MEMBER** for established Department of Pathology. Primary responsibility for developing and managing computer laboratory data system. Rank, title, and salary competitive and commensurate with credentials. Requires earned doctorate and substantial experience in computer laboratory systems. Board-certification or the equivalent and eligibility for California licensure required. Position open until filled. Send curriculum vitae and five references to: **George D. Lundberg, M.D., Chairman, Department of Pathology, Room 3453, MSIA, University of California, Davis, California 95616.** *An Equal Opportunity/Affirmative Action Employer.*

FACULTY POSITIONS IN PHYSIOLOGY

The Department of Physiology and Biophysics, The University of Iowa College of Medicine, invites applications from individuals having the Ph.D. or M.D. degree for non-tenure faculty positions at the associate level. Candidates should be prepared to participate in the medical and graduate training activities of the department and conduct research in neurophysiology, membrane physiology, or endocrinology. Please send curriculum vitae, a brief description of research interests, teaching experience and career objectives, and names of three references to: **Dr. Robert E. Fellows, Department of Physiology and Biophysics, The University of Iowa College of Medicine, Iowa City, Iowa 52242.** *The University of Iowa is an Equal Opportunity/Affirmative Action Employer.*

MATHEMATICIAN. One-year, full-time position for a lecturer with a background in computer-information science and/or physics to teach courses in the introductory mathematics program and participate in computer/assisted instruction and computer literacy programs. Minimum qualifications: Ph.D. and teaching experience, particularly with minority students. Salary: \$17,472. Effective fall 1980. Provide curriculum vitae, three letters of reference, and a cover letter relating teaching and research interests and experience to: **Science Faculty Search Committee, Oakes College, University of California, Santa Cruz, Calif. 95064.** Deadline is 16 May 1980.

An Affirmative Action/Equal Opportunity Employer

PHYSICIANS for academic tenure-track positions in the Department of Laboratory Medicine (ABP-CP of ABIM certification required) for patient care, teaching and research. Subspecialty preferred, blood banking, hematology, chemical pathology, and medical microbiology. Send curriculum vitae and three references to: **Emily Barrineau, Department of Laboratory Medicine, Medical University of South Carolina, 171 Ashley Avenue, Charleston, South Carolina 29403.** *Affirmative Action/Equal Opportunity Employer, M/F/H.*

AMAZON POSTDOCTORAL, 1 September. Work with American/Brazilian research team in limnological/ecological studies of freshwater communities in Central Amazon Basin. Candidate expected to participate in group program and pursue own related research. Preference given to applicants with experience in ecosystem modeling. Must have strong background in freshwater biology, constitution for rigors of field work, ability to learn foreign language. Position up to 2 years, including 12 consecutive months in field starting January 1981 in Manaus, Brazil. Send curriculum vitae and three letters of recommendation to: **Dr. Thomas M. Zaret, Department of Zoology, Institute for Environmental Studies, FM-12, University of Washington, Seattle, Wash. 98195.**

POSITIONS OPEN

UNIVERSITY OF OKLAHOMA COLLEGE OF MEDICINE

Applicants are solicited for **FACULTY POSITIONS** in the following departments:

MEDICINE (Number 230)—**Professor**, chief of immunology Section, Department of Medicine and Arthritis Section, Oklahoma Medical Research Foundation. Individual must have an established clinical and investigative record and be eligible for professional rank. **PHYSIOLOGY** (Number 228)—**Research associate**, instrument and conduct experiments on primates. This will include experimental design, data acquisition, and analysis. Scientific papers will be prepared from the results to submit to referred journals. Ph.D. degree is required with emphasis on physiology. **PSYCHIATRY** (Number 194)—**Clinical assistant/associate professor**, clinical evaluator for psychotherapy of depression collaborative study. Ph.D. in clinical psychology. Interest in the measurement of human behavior and in clinical research; (Number 195) **Adjunct assistant/associate professor**, project coordinator for psychotherapy of depression collaborative study, Ph.D. in psychology. Research training and experience.

Applicants should send curriculum vitae, identifying vacancy number for which they are applying, to: **Dr. Thomas N. Lynn, Dean, College of Medicine, University of Oklahoma Health Sciences Center, P.O. Box 26901, Oklahoma City, Okla. 73190.** *We are an Equal Opportunity Employer.*

IMMUNOGENETICIST

UNIVERSITY OF CALIFORNIA, BERKELEY

The Department of Microbiology and Immunology at the University of California, Berkeley, is seeking an immunogeneticist to fill a tenure-track faculty position at the assistant professor level beginning 1 January 1981. Applicants should hold a Ph.D. or M.D. degree and have 3 years of postdoctoral research experience. Responsibilities include development of a graduate-level course in immunogenetics, participation in graduate and undergraduate instruction in immunology, and establishment of a strong independent research program to provide training for graduate students and postdoctoral fellows in the candidate's main area of interest. Preference will be given to candidates with postdoctoral training and major research interest in molecular mechanisms of gene expression and control.

Please send curriculum vitae, summary of proposed research program, and the names of three references by 1 September 1980 to:

Dr. Marian E. Koshland
Department of Microbiology and Immunology
University of California, Berkeley
Berkeley, Calif. 94720

The University of California is an Affirmative Action Employer.

MICROBIAL PHYSIOLOGIST. A full-time, tenure-track position at assistant professor level for a microbial physiologist, Ph.D. M.D., or D.Sc., with postdoctoral experience and a strong background in research. The primary duties include lectures to medical and dental students, and the guidance of graduate students in their research for fulfillment of graduate degree requirements. The successful candidate is expected to develop a research program of his/her own choosing in this field and to obtain extramural funding for this purpose. Please send curriculum vitae with three letters of reference to: **Dr. P. V. Liu, Acting Chairman, Department of Microbiology and Immunology, University of Louisville, Health Sciences Center, Louisville, Kentucky 40292.** *The University of Louisville is an Affirmative Action/Equal Opportunity Employer.*

ORGAN FUNCTION PHYSIOLOGIST, PHARMACOLOGIST, or TOXICOLOGIST. Applicants should have a minimum of 5 years of postdoctoral experience in animal experimentation, with publications on cardiovascular, renal, gastrointestinal, or endocrine function. In vivo experience in normal and pathologic states preferred. Position involves the evaluation of physiologic effects of exposure of animals to industrial chemicals and the application of results to occupational hazard prevention. The individual selected will supervise two professionals. Salary from \$24,703 to \$29,375, depending upon qualifications and experience. This position is in the career Civil Service or PHS Commissioned Corps. Contact: **Dr. Trent Lewis, Chief, Experimental Toxicology Branch, National Institute for Occupational Safety and Health, 4676 Columbia Parkway, Cincinnati, Ohio 45226.** Telephone: 513-684-8392.

An Equal Opportunity/Affirmative Action Employer

POSITIONS OPEN

POSITION AVAILABLE CENTER FOR ENERGY AND ENVIRONMENT RESEARCH UNIVERSITY OF PUERTO RICO (UPR)

MAYAGUEZ LABORATORY—MARINE ECOLOGIST to head a research division conducting studies with pelagic and coastal ecosystems in tropical seas. Minimum requirements: Ph.D. degree in marine ecology/biological oceanography or related area; and 3 to 5 years experience in research and administration. Salary and benefits to be negotiated. Send résumé to:

Dr. Juan A. Bonnet, Jr., Director
Center for Energy and Environment Research
Caparra Heights Station
San Juan, Puerto Rico 00935

*Operated by UPR for U.S. Department of Energy.

NEUROPHYSIOLOGIST— POSTDOCTORAL POSITION

By 1 July 1980. Recent doctoral degree preferred; experience in recording of peripheral nerve discharge essential; experience in recording respiratory responses desirable. To work in laboratory of A. Hess, Department of Anatomy, on effects of neurotransmitter substances on rat carotid body. Appointment for 1 year, renewable. Please send curriculum vitae and two letters of reference to: **Personnel Department, COLLEGE OF MEDICINE AND DENTISTRY OF NEW JERSEY—Rutgers Medical School, Piscataway, New Jersey 08854. An Equal Opportunity/Affirmative Action Employer, M/F.**

PHYSICAL SCIENCES LIBRARIAN. Search reopened for head of a physical sciences group of branch libraries, including Astronomy/Mathematics/Statistics and Computer Sciences; Chemistry; Earth Sciences; Engineering; and Physics. Responsible for coordinating budgeting, staffing, collection development, and circulation and references services for these libraries, each of which is headed by a librarian. Total staffing approximately 16 FTE with an annual book/serial budget in excess of \$300,000. Under the general direction of the Associate University Librarian for Public Service the incumbent will be expected to evaluate existing and develop new programs such as library instruction and computerized literature searching. Requires M.L.S. degree, extensive experience in a science library, demonstrated successful managerial style with an appreciation and understanding of group processes and decision-making, and demonstrated ability in personnel management and budgeting. Full job description will be mailed on request. Salary in the \$18,000 to \$26,000 plus range, depending on qualifications.

Send résumé, including names of three professional references, by 31 May 1980 to:

William E. Wenz, Personnel Officer
Room 447 General Library
University of California
Berkeley, California 94720

An Equal Opportunity/Affirmative Action Employer

POSTDOCTORAL FELLOW

Mechanisms of thermostability, protein folding-unfolding, biophysical/biochemical techniques applied to glutamine synthetases from extreme thermophile. Available 1 October 1980 for 1 year with renewal by mutual agreement. Closing date: 30 June 1980 or until a satisfactory candidate is selected. Send curriculum vitae, thesis synopsis, and names of three references to: **Dr. F. C. Wedler, Biochemistry Program—Department of Microbiology, Cell Biology, Biochemistry and Biophysics, 203 Althouse Laboratory, The Pennsylvania State University, University Park, Pa. 16802.**

An Affirmative Action/Equal Opportunity Employer

POSTDOCTORAL POSITIONS

Available immediately for 2 to 3 years. One person is required to study the role of mutations and DNA repair processes in cancer development using cultured human fibroblasts from normal and cancer-prone individuals. The second position is to work on the genetic and biochemical characterization of mutants of human and Chinese hamster cells affected in various cellular processes. Salary in range of \$12,000 to \$14,000 per annum. Send résumé as early as possible to: **Dr. R. S. Gupta, Departments of Medicine and Biochemistry (4N83), McMaster University, Hamilton, Ontario, Canada L8N 3Z5.**

POSITIONS OPEN

POSTDOCTORAL POSITIONS

Postdoctoral positions (two) in: (i) the transport and molecular dynamics of copper utilization in isolated liver and intestinal cells, and (ii) the role of copper and related metals in the regulation of metalloprotein biosynthesis in eukaryotes. Area (i) involves identification of the components and processes involved and their relations to two diseases. Area (ii) requires experience in regulation of gene expression to test for specific effects on transcription and translation. Exposure to physical biochemical research on copper proteins within our Bioinorganic Research Group will be part of the experience. Please send curriculum vitae, including summary of research experience and interests, with two reference letters to: **Dr. Murray J. Ettinger, Department of Biochemistry, State University of New York at Buffalo, Buffalo, N.Y. 14214.**

POSTDOCTORAL POSITION. Tumor immunology to work on the biochemistry and immunochemistry of normal and tumor specific murine leukemia and lymphoma cell antigens. Of particular interest is the interaction of shed tumor complexes with host immune system; the mechanisms of lymphoma antigen expression; and the cell biology of tumor cell membranes in vitro and in vivo systems. A strong background in biochemistry, cell biology, immunology, or cellular immunology is required. Salary approximately \$14,000 per year. Available immediately. Send curriculum vitae to: **Dr. Walter J. Esselman, Department of Surgery and Microbiology, Michigan State University, East Lansing, Mich. 48824.**

Michigan State University is an Affirmative Action/Equal Opportunity Employer.

POSTDOCTORAL POSITION available 1 June 1980 to study nucleoside interactions with lymphocyte cell lines. Salary: \$13,000. Biochemistry background preferred. Please send curriculum vitae and names of three references to: **Dr. P. R. Strauss, Department of Biology, Northeastern University, 360 Huntington Avenue, Boston, Mass. 02115. An Affirmative Action Employer.**

POSITIONS OPEN

POSTDOCTORAL FELLOW and RESEARCH ASSOCIATE positions available in protein chemistry and affinity labeling of purine nucleotide sites in enzymes. Postdoctoral stipend: \$14,000 to \$16,000. Research associate stipend: \$17,000 to \$19,000. Support available for 5 years. Send résumé and names of three references to: **Dr. Roberta F. Colman, Chemistry Department, University of Delaware, Newark, Del. 19711. The University of Delaware is an Equal Opportunity Employer and encourages applications from qualified minority groups and women.**

POSTDOCTORAL POSITION available commencing July 1980 for Ph.D. or M.D. in the field of neuroendocrinology/neurochemistry. Successful applicant will join ongoing research in normal and tumor biosynthesis of peptide hormones, particularly of vasopressin, oxytocin, and neurophysins. Send curriculum vitae and names of three referees to:

Dr. William G. North
Department of Physiology
Dartmouth Medical School
Hanover, N.H. 03755

POSTDOCTORAL POSITION IN VISION RESEARCH available now in Northwestern University, Department of Psychology, to work on motion perception as relates to aviation and visual function in aging humans. Practical skills in electronics and computers are essential. Good salary; renewable for 2 or 3 years. Send résumé to: **Dr. Robert Sekuler, Cresap Neuroscience Laboratory, Northwestern University, Evanston, Illinois 60201. Northwestern University is an Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL POSITION IN ENZYMOLOGY. Research associate needed on 1 July for study of enzymes in the dopamine system, part of a large research program on the biochemistry of mental disorders. Experience in enzymology, HPLC, and/or antibody production desirable. Salary competitive. Send résumé to: **Dr. Creed W. Abell, Professor and Director of Biochemistry, The University of Texas Medical Branch, Galveston, Texas 77550. An Equal Opportunity/Affirmative Action Employer.**

DEPUTY ASSOCIATE COMMISSIONER FOR HEALTH AFFAIRS (EDUCATION AND PROFESSIONAL TRAINING)

The Food and Drug Administration (FDA) has a permanent civil service or Public Health Service Commissioned Corps position available for the Deputy Associate Commissioner for Health Affairs (Education and Professional Training) in Rockville, Maryland. Responsibilities involve planning and directing scientific education programs on a nationwide basis in order to stimulate understanding and generate support for FDA's efforts toward protecting the public health.

Applicants must have: experience in developing broad programs designed to present scientific and highly technical medical concepts to health professionals. These programs should have included such activities as the development of curricular materials, publications, audiovisuals, or conferences; demonstrated leadership and managerial abilities in a scientific environment; ability to deal with higher level governmental officials, the scientific and academic communities, medical and health related organizations, and representatives of the regulated industry; and ability to implement equal employment opportunity programs. It is desirable that applicants have: a doctorate in a related health science or public health education; at least 1 year of professional experience at the GS-15 or equivalent level; experience in planning and directing professional communications programs in the health field; experience which reflects substantial managerial responsibility for executing professional health communications programs and which included the supervision of specialists in education, information, conference planning, and other health communication activities; and a knowledge of FDA's laws and regulations.

Applicants for this position under the Civil Service System are advised that this position has been designated to be in the Senior Executive Service (SES); the selectee will be required to join the SES and serve a 1-year probationary period. Under the SES, the annual salary range is \$47,889 to \$50,112.50. Applicants for this position under the Commissioned Corps are advised that pay and allowances are dependent on rank and years of creditable service. U.S. PHS Commissioned Corps Officers as well as Civil Service candidates are encouraged to apply. Applications will be accepted from all qualified U.S. citizens.

Applicants under Civil Service must send a current, complete Personal Qualifications Statement (SF-171) to: **FDA, Operational Policy Branch, HFA-440, Parklawn Building, 5600 Fishers Lane, Rockville, Maryland 20857, attention: James Keady or telephone: 301-443-4210.** Applicants for the Commissioned Corps may submit a résumé to be considered for this position, but appointment is contingent upon acceptance into the Commissioned Corps. Applicants must provide detailed evidence of possession of the experience, knowledge, skill, ability, and other personal characteristic requirements and show how and when they were used (either on the SF-171, a separate attachment, or in the résumé). Applicants will be evaluated on the basis of their abilities, education, relatedness of experience, and career progression. All applications are subject to the Privacy Act and become the property of the Department of Health, Education, and Welfare. *Equal Opportunity Employer.*

POSITIONS OPEN

POSTDOCTORAL POSITION. Membrane physiologist to work on epithelial electrophysiology. Available 15 July 1980 for 7 to 12 months. Requirements: five or more years of postdoctoral, including extensive experience in mathematical modeling, noise analysis, and experimental studies of epithelial electrophysiology and ion selectivity.

Send curriculum vitae and names of references to:

Dr. Wilfried F. H. M. Mommaerts
Department of Physiology
University of California
School of Medicine
Los Angeles, Calif. 90024

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

POSTDOCTORAL POSITION for nucleic acid chemist or enzymologist or bacterial/phage geneticist to join research program on the DNA sequence and genetic control mechanism of the histidine operon. This is an opportunity to learn current and future methods of genetic engineering with single-stranded phage vectors, and DNA sequencing by the dideoxy method. Salary: \$15,000 to \$20,000, depending on background. A physical scientist with a genuine interest in orienting toward molecular biology is also encouraged to apply. Reply with curriculum vitae and names of three or more references to: **Dr. Wayne M. Barnes, Assistant Professor, Department of Biological Chemistry, Washington University School of Medicine, St. Louis, Missouri 63110.**

POSTDOCTORAL POSITIONS in molecular biology of eukaryotic replication and chromatin functions. One position open immediately, and one in early 1981. Applicants please contact: **Dr. Ronald L. Seale, Department of Cellular Biology, Scripps Clinic and Research Foundation, 10666 North Torrey Pines Road, La Jolla, Calif. 92037.**

POSTDOCTORAL POSITION in pharmacology available in July 1980 for research on drug-behavior interactions. A Ph.D. in pharmacology with experience in gas chromatography is preferred, but Ph.D.'s in psychology with a strong background in behavioral pharmacology will be considered. Send curriculum vitae and two letters of reference to: **Dr. D. E. McMillan, Professor and Chairman, Department of Pharmacology, University of Arkansas for Medical Sciences, 4301 West Markham Street, Little Rock, Arkansas 72205.**

POSTDOCTORAL RESEARCH APPOINTMENT

Available September 1980 for a Ph.D. with strong background in protein and nucleic acid biochemistry. Knowledge of protein structure, cross-linking agents, and cell-free systems desirable. Research will involve investigating the protein subunit structure of the nuclear matrix and its association with HnRNA and mRNA and the chromatinic nuclear matrix interactions.

Send curriculum vitae, statement of research interest, and three references to:

**A. O. POGO, M.D., Head,
Laboratory of Cell Biology
THE KIMBALL RESEARCH
INSTITUTE of the
NEW YORK BLOOD CENTER
310 East 67 Street, N.Y., N.Y. 10021**

*An Equal Opportunity/
Affirmative Action Employer*

POSTDOCTORAL RESEARCH ASSOCIATE

Position available for 1 or 2 years beginning summer 1980 for research limnologist or freshwater ecologist. Specialty open. Research will be conducted at a well-equipped field site on a large Venezuelan lake. Salary competitive. Send résumé, names of three references, and explanation of research interests to: **Dr. William M. Lewis, Jr., Department of EPO Biology, Box 334, University of Colorado, Boulder, Colo. 80309.** Applications accepted through May 1980. *The University of Colorado is an Affirmative Action/Equal Opportunity Employer.*

POSITIONS OPEN

POSTDOCTORAL OR RESEARCH ASSOCIATE position in biochemistry to study the genetic and metabolic regulation of gene expression in cultured eukaryotic cells. Work includes analysis of cell-free transcriptional and translational systems from mammalian cells, as a function of growth, cell cycle, growth factors, and so forth, and from mutant mammalian cells and yeast. Send curriculum vitae and two letters of reference to: **Dr. Kivie Moldave, Department of Biological Chemistry, California College of Medicine, University of California, Irvine, Calif. 92717.** *The University of California is an Affirmative Action Employer.*

POSTDOCTORAL RESEARCH ASSOCIATE

Position available 1 July 1980 for studying somatic cell hybridization in malignancy. Candidate with background in genetics and cell hybridization desired. Experience in hybridoma antibodies helpful. Excellent facilities available. Salary: \$15,000 to \$18,000. Apply with curriculum vitae and references to: **Dr. David M. Goldenberg, MS 409 Medical Center, University of Kentucky, Lexington, Ky. 40536** by 20 May 1980.

POSTDOCTORAL RESEARCH ASSOCIATE IN PHYSIOLOGY-PHARMACOLOGY-BIOCHEMISTRY of secretion related to CO₂, acid-base, and carbonic anhydrase. Particular focus is on ocular and cerebrospinal fluids, and uterine fluid milieu at stages of cycle and pregnancy. Relations are sought between chemical reactions and physiological events. Projects will offer considerable latitude to the talented investigator. NIH funded 3 years ahead. Please write to: **Dr. Thomas H. Maren, Department of Pharmacology, University of Florida College of Medicine, Box J-267, JHMHC, Gainesville, Fla. 32610.** *We are an Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL RESEARCH ASSOCIATE

Postdoctoral position to study the expression of viral and cellular genes in avian retrovirus infected cells; particular emphasis on molecular events which result in helper virus-associated cancers. Candidates with experience in restriction endonuclease analysis of DNA's and/or transfection who are interested in working with DNA's from tumors from genetically defined viruses (we are currently working with c region recombinants) in genetically defined chickens (bred to contain only one endogenous virus locus) are preferred. Send curriculum vitae and three letters of reference to: **Dr. Harriet Robinson, c/o Personnel Office, Worcester Foundation for Experimental Biology, 222 Maple Avenue, Shrewsbury, Mass. 01545.**

An Equal Opportunity/Affirmative Action Employer

POSTDOCTORAL OR RESEARCH ASSOCIATE POSITION available now in molecular cytogenetics and somatic cell genetics.

Experience in cytogenetics, cell culture, restriction mapping, molecular hybridization and/or recombinant DNA techniques would be desirable. Ongoing projects involve banding and immunological approaches to chromosome structure and function, gene amplification, gene regulation by DNA methylation, and restriction mapping.

Send curriculum vitae to:

**Professor Orlando J. Miller
Department of Human Genetics
and Development, HHSC 1424
College of Physicians and Surgeons
Columbia University
701 West 168 Street
New York, N.Y. 10032**

An Affirmative Action/Equal Opportunity Employer

POSTDOCTORAL RESEARCH ASSOCIATE

A 3-year position available immediately for Ph.D. in biochemistry or human genetics for a research project on cystic fibrosis. Send résumé to: **Dr. Hope Punnett, Genetics Laboratory, St. Christopher's Hospital, 2600 North Lawrence Street, Philadelphia, Pa. 19133.** *Equal Opportunity Employer, M/F/H.*

POSTDOCTORAL RESEARCH POSITIONS-IMMUNOLOGY. Available immediately in areas related to regulation of the immune response, immunochemistry, and membrane phenomenology. Applicants should have background in immunology and/or protein chemistry. Please send curriculum vitae and have letters of three referees sent directly to: **Dr. A. Sehon, Head, Department of Immunology, Faculty of Medicine, University of Manitoba, Winnipeg, Manitoba, Canada R3E 0W3.**

POSITIONS OPEN

INSTITUT NATIONAL DE LA RECHERCHE SCIENTIFIQUE UNIVERSITE DU QUÉBEC

PROFESSEUR

FONCTIONS: Faire de la recherche principalement dans le domaine du confinement magnétique des plasmas. S'insérer dans une équipe de recherche et contribuer à l'étude et au développement de diagnostics plasmas (fluorescence, laser sous milli-métrique, spectroscopie U.V.). Donner des cours au niveau gradué en physique des plasmas. Diriger des étudiants au niveau de la maîtrise et du doctorat.

EXIGENCES: Doctorat et expérience pertinente en physique expérimentale des plasmas.

LIEU DE TRAVAIL: INRS-Energie, Varennes (près de Montréal), Québec.

SALAIRE: Selon la convention collective des professeurs et en fonction des qualifications et de l'expérience.

Faire parvenir votre curriculum vitae en indiquant le numéro du concours SP 80-05 avant le 31 mai 1980 au:

**Directeur du personnel
Institut National de la Recherche Scientifique
2700 rue Einstein
Case postale 7500
Sainte-Foy, Québec, Canada G1V 4C7**

NATIONAL SCIENCE FOUNDATION PROGRAM MANAGER

The National Science Foundation's Division of Applied Research, Applied Physical Mathematical and Biological Sciences and Engineering Section, Directorate for Engineering and Applied Science, is seeking candidates for the position of Program Manager for Applied Biology. This position is a 2-year rotational appointment excepted from the competitive civil service, EC-13/14 grade level (equivalent to the GS-13/14), salary range from \$29,375 to \$45,126 per annum, depending on qualifications and experience. Qualifications: applicants should have a Ph.D. or equivalent experience in plant physiology, botany, or related fields; a strong research and publication record; and demonstrated ability to work effectively in an interdisciplinary environment and to relate well to policy-makers or other potential users of applied research is highly desirable. The program manager is responsible for the proper functioning and administering of the applications area assigned. Duties and responsibilities include but are not restricted to, program management, proposal processing and evaluation, consultation and liaison, and administration of program assigned. This program considers all applied biology proposals except those for development or clinical research. Those interested in applying should submit a résumé to: **The National Science Foundation, Personnel Administration Branch, EX 80-12, 1800 G Street, NW, Room 212, Washington, D.C. 20550, attention: E. Paul Broglio.** For further information, telephone: 202-357-4107. *The National Science Foundation is an Equal Opportunity Employer.*

RESEARCH ASSOCIATE LASER LIGHT SCATTERING IN SEMICONDUCTORS

The Department of Physics at Kansas State University expects to have a postdoctoral position available beginning 1 July 1980 to participate in a program of inelastic light scattering studies of laser annealing mechanisms in semiconductors. Techniques will include ion implantation and Raman scattering with tunable pulsed and cw lasers. A background in semiconductor physics and/or laser light scattering is desirable. The initial appointment will be for 1 year but by mutual agreement may be extended for a second year. Applications should be sent prior to 1 June 1980 to: **Professor A. Compaan, Department of Physics, Kansas State University, Manhattan, Kansas 66506.** *Kansas State University is an Equal Opportunity/Affirmative Action Employer.*

RESEARCH ASSOCIATE IN PSYCHOBIOLOGY. Cincinnati Children's Hospital Research Foundation, Institute for Developmental Research, has a full-time position (nontenured) in the Division of Inborn Errors of Metabolism. Research project involves anatomic and behavioral correlates of early development and aging. It will require skills in neuroanatomy, embryology, teratology, and behavioral science.

Interested persons send résumé to: **Dr. S. Soukup, Children's Hospital Research Foundation, Elland and Bethesda Avenues, Cincinnati, Ohio 45229.**

Equal Opportunity Employer

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\$24,703 to \$32,110 per annum
(commensurate with qualifications)

The U.S. Naval Research Laboratory is seeking an individual to perform research in the fields of real-time spectroscopic investigations of primary photo-initiated reactions in energetic molecules; electron/proton transfer, energy transfer, and relaxation processes in molecules of biological interest; and development of advanced picosecond laser sources and diagnostic techniques. A B.S. in Chemistry and minimum of three years of professional experience dealing with picosecond laser sources and synthesis of organic materials is required. A Ph.D. is highly desirable.

Send detailed resume or SF-171 (Personal Qualifications Statement) prior to 16 May 1980 to:

Civilian Personnel Office
Naval Research Laboratory
4555 Overlook Avenue, S.W.
Washington, D.C. 20375
Code 65-008-13S
Attn: Edmond Menoche



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ENERGY

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ESCOE conducts independent, objective technical and economic assessments of Department of Energy technology RD&D programs. The results of these assessments are used to assist in planning and management of existing and future energy technology programs conducted or sponsored by the Federal government.

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- development of methods and standards for technology evaluations,
- technology and product market evaluations,
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ESCOE is a nonprofit corporation established by the five Founder Engineering Societies (AIChE, AIME, ASME, ASCE, and IEEE). Offices are located near the U.S. Department of Energy and the U.S. Capitol.

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



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Washington, D.C. 20001

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

SENIOR INVESTIGATOR

The University of Massachusetts Medical School is now recruiting for a Senior Investigator with an established international reputation in a basic or clinical biomedical field to serve as Associate Dean for Scientific Affairs. This individual will oversee the administration of all extramural and intramural research and develop new schoolwide research programs. He/she will advise the Dean/Chancellor on all matters related to the scientific activities of the Medical School and will be responsible for fostering and encouraging both clinical and basic research at this institution. The successful applicant will be expected to carry out his/her own research program.

Please send resumes to Dr. Maurice Goodman, Chairman, Department of Physiology.

55 Lake Avenue North
Worcester, MA 01605

University of
Massachusetts
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Research Biochemist

A challenging opportunity to continue a successful research career is available with American Cyanamid's Medical Research Division where our Infectious Disease Research Section is involved in the isolation and immunological evaluation of antigens from human viral pathogens.

We seek an investigator with a proven record of success in application of the techniques of molecular virology to this area. The position requires 2-3 years of accomplishment at post doctoral level. Strong background in biochemistry with experience in orthomyxovirus research is preferred.

American Cyanamid offers competitive salaries and comprehensive benefits, including dental and savings plan. To further explore this opportunity, please send resume and salary history, in confidence to:

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Professional Employment Coordinator
Medical Research Division
Lederle Laboratories
Pearl River N.Y. 10965



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POSITIONS OPEN

THE DEPARTMENT OF ZOOLOGY of the University of California, Davis Announces the vacancy of a PROFESSORSHIP in the area of ANIMAL ECOLOGY

The Department of Zoology has a position for a senior-level ecologist with an international reputation in the field of animal ecology. The person should have an exceptional record of productivity and have demonstrated excellence in both theoretical and empirical aspects of animal ecology. The candidate should have a vigorous current research program in ecology and have demonstrated competence in graduate training and undergraduate education. The appointment is at a full professor level; salary will depend upon qualifications and experience.

Applicants should forward curriculum vitae, including a list of all publications, copies of three recent significant publications, and the names of three references to: **Dr. J. A. Stamps, Chairperson of the Search Committee, Department of Zoology, University of California, Davis, Calif. 95616.** The University of California is an Equal Opportunity/Affirmative Action Employer. Closing date for receipt of applications is 30 May 1980.

NATIONAL SCIENCE FOUNDATION (NSF) PROGRAM DIRECTOR

The National Science Foundation's Division of Physiology, Cellular and Molecular Biology is seeking qualified applicants to fill a 1- to 2-year rotational appointment as program director for the Biochemistry Program. The position is exempted from the competitive civil service at the EC-14/EP (equivalent to GS-14/15) level; salary range from \$34,713 to \$53,081 (\$50,012.50 by statute) per annum, based on professional qualifications and experience. The Biochemistry Program supports research aimed at understanding the molecular basis of life. Some of the areas covered include the mechanism of enzyme action; biosynthesis of macromolecules; structure and function of biomolecules; generation, storage, and transduction of energy; organization and function of cell walls and membranes; and the physicochemical properties of contractile proteins. Support is also provided for studies dealing with virus structure, virus-host interaction, and the mechanism of virus replication. Applicants should have at least 6 to 8 years of experience beyond the Ph.D. and a broad understanding of current research in biochemistry. Applicants should submit a résumé or curriculum vitae to: **The Division of Personnel and Management, Personnel Administration Branch, Room 212, 1800 G Street, NW, Washington, D.C. 20550, attention: E. Paul Broglio.** For further information, telephone: 202-357-4106. Closing date for applications is 16 May 1980. NSF is an Equal Opportunity Employer.

RESEARCH ASSOCIATE POSITION available immediately for research in regulation and mechanism of DNA synthesis in phage using electron microscopy. Located in new and expanding medical school. Send résumé and names of three references to: **Dr. Garret Ihler, Head, Department of Medical Biochemistry, Texas A & M University, College of Medicine, College Station, Texas 77843.** Equal Employment Opportunity through Affirmative Action.

RESEARCH ASSOCIATE, staff position, is available 1 July 1980 for studies on the genetics of frog virus 3. Two or more years of postdoctoral experience are required. A background in virus genetics is highly desirable. Please send curriculum vitae and names of three references to: **Allan Granoff, Ph.D., Chairman, Division of Virology, St. Jude Children's Research Hospital, P.O. Box 318, Memphis, Tenn. 38101.** Equal Opportunity/Affirmative Action Employer.

VISITING INVESTIGATOR position with salary is available 1 July 1981 through 30 June 1982, for an experienced investigator to work collaboratively on the molecular biology of frog virus 3 replication. Areas of research include structure and functional organization of the viral genome, mechanisms of transcriptional and translational control, and the isolation, characterization, and function of viral structural proteins. Send curriculum vitae, research interest, and the names of three references to: **Allan Granoff, Ph.D., Chairman, Division of Virology, St. Jude Children's Research Hospital, P.O. Box 318, Memphis, Tenn. 38101.** Equal Opportunity/Affirmative Action Employer.

POSITIONS OPEN

RESEARCH ASSOCIATE/POSTDOCTORAL to investigate specific interactions between cytoskeletal proteins and coated vesicles; \$13,000 to \$17,000. Send résumé to: **Dr. Douglas Murphy, Department of Cell Biology, The Johns Hopkins School of Medicine, Baltimore, Maryland 21205.** University of Maryland Baltimore County is an Equal Opportunity/Affirmative Action Employer.

RESEARCH ASSOCIATE

Postdoctoral position available 1 July 1980 on NIH-funded research project to investigate transcription and translation in systems derived from parvovirus-infected animal cells. Experience with RNA isolation and characterization, restriction enzyme analysis, nucleic acid hybridization, gel electrophoresis, and in vitro translation is appropriate. Applicants should submit curriculum vitae and names of three references by 1 June 1980 to: **E. R. Stout, Department of Biology, Virginia Polytechnic Institute and State University, Blacksburg, Va. 24061.** An Equal Opportunity/Affirmative Action Employer.

RESEARCH ASSOCIATE. A postdoctoral position starting 1 July 1980 or thereafter is open for a biochemist or molecular biologist experienced with in vitro transcribing systems to work on problems related to ribosomal RNA transcription. Salary range: \$12,000 to \$14,000. Send curriculum vitae, brief description of current research, and two references to: **H. W. Schaup, Department of Biochemistry and Biophysics, Oregon State University, Corvallis, Oregon 97331.** Oregon State University is an Affirmative Action/Equal Opportunity Employer and complies with Section 504 of the Rehabilitation Act of 1973.

RESEARCH ASSOCIATE IN PHARMACOLOGY

Position available for research associate to study drug effects on cardiac development using biochemical and morphologic techniques. Doctorate required, plus background in biochemistry, pharmacology, or cell biology desired. Salary competitive. Send application to: **Dr. Andrew K. S. Ho, Associate Professor of Pharmacology, University of Illinois, Peoria School of Medicine, 123 Southwest Glendale, Peoria, Illinois 61605.** Equal Opportunity/Affirmative Action Employer.

RESEARCH ASSOCIATE

Ph.D., organic chemistry—3 years of postdoctoral experience in synthesis, mechanisms, and oxidation reactions for research in the chemistry of polycyclic aromatic hydrocarbons. Salary: \$16,250 per year. Contact: **Dr. E. Cavalieri, Eppley Institute, University of Nebraska Medical Center, Omaha, Neb. 68105.**

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RESEARCH ASSOCIATE IN PHYSIOLOGY

Position available for research associate to study renal transport using microperfused nephron segments in vitro. Doctorate required, plus background in physiological and biochemical techniques desired. Salary competitive. Send application to: **Dr. Darryl R. Peterson, Associate Professor of Physiology, University of Illinois, Peoria School of Medicine, 123 Southwest Glendale, Peoria, Illinois 61605.** Equal Opportunity/Affirmative Action Employer.

Applications from Ph.D.'s are invited for **TEACHING POSITIONS** in the following courses:

**Physiology
Biochemistry
Anatomy
Immunology
Pathology**

The University is located in the West Indies. Please send curriculum vitae to:

**St. George's University
c/o Foreign Medical School Service
Corp.
One East Main Street
Bay Shore, New York 11706**

POSITIONS OPEN

RESEARCH ASSOCIATE IN DEVELOPMENTAL NEUROBIOLOGY to participate in an ongoing project utilizing monoclonal antibodies to study synaptogenesis and neuronal differentiation in vitro and in vivo. Experience in electron microscopy required, and experience in cell culture, biochemistry, and immunocytochemistry is highly desirable. Salary: \$13,500 per year or higher, depending upon experience. Available fall 1980. Send curriculum vitae and the names and addresses of three references by 6 June 1980 to: **Dr. Robert S. Lasher, Department of Anatomy, B111, University of Colorado Medical School, 4200 East Ninth Avenue, Denver, Colorado 80262.**

A **RESEARCH ASSOCIATE (POSTDOCTORAL) POSITION** is available immediately for 1 to 2 years to study the relationship of intracellular lysosomal enzymes to bacterial inactivation using quantitative cytospectrophotometry. Experience in histochemistry and cytophotometry is highly desirable. Salary is \$13,000 to \$15,000. Send curriculum vitae and references to: **Dr. Elliot Goldstein, Department of Medicine, University of California at Davis, School of Medicine, Davis, California 95616.** An Equal Opportunity/Affirmative Action Employer.

SEDIMENTOLOGIST AND/OR PETROLEUM GEOLOGIST REQUIRED DEPARTMENT OF EARTH SCIENCES UNIVERSITY OF MANITOBA

Subject to budgetary approval, the Department of Earth Sciences will have a position available at the assistant professor level or possibly the associate professor level. Candidates should hold the Ph.D. degree and have experience in sedimentary and/or petroleum geology. The successful candidate is expected to do research and to teach undergraduate and graduate courses such as introductory physical geology, petroleum geology, sedimentation, stratigraphy, or areas of the candidate's specialty. The appointment will be made as soon as possible after 1 July 1980. Canadian citizens, permanent residents, and others eligible for employment in Canada at the time of application are especially encouraged to apply.

Applications, including curriculum vitae and names of three referees, should be sent to:

**Head, Department of Earth Sciences
University of Manitoba
Winnipeg, Manitoba, Canada R3T 2N2**

STERILIZATION SCIENTIST—Johnson & Johnson, a leader in the health care industry, has an immediate opportunity for an individual with at least 3 years of expertise in sterilization technology. The qualified candidate will have an advanced degree (Ph.D., M.S.) in chemistry, chemical engineering, or microbiology and be knowledgeable in radiation, ethylene oxide, and steam systems. Responsibilities include sterilization cycles and process development, evaluating the interaction of sterilizing agents on medical devices, technical support activities, and evaluation of new technology. This position offers growth and professional advancement in a high visibility area. The successful candidate will possess strong managerial and written/oral communication skills. We offer excellent starting salaries and relocation assistance, and are located in central New Jersey. Qualified candidates should send their résumés, including salary history and requirements, to: **Gary Barksdale, J-129, Johnson & Johnson Products Company, 501 George Street, New Brunswick, New Jersey 08903.** Leadership Beyond Compliance. An Equal Opportunity Employer, M/F/H.

TECHNICAL MANAGER (ADHESIVES). Johnson & Johnson Products Company Inc., a leader in the health care industry has an immediate opportunity available for an individual with 5 to 10 years of research and development expertise in product and process development utilizing polymer systems. The qualified candidate will have an advanced degree (Ph.D. or M.S.) in chemistry or chemical engineering and substantial experience in adhesives technology. Duties include translating new product and technology concepts into manufacturing processes. Will be responsible for developing and implementing cost improvement program based on technical innovation in both process and material areas. The successful candidate should possess strong managerial and written/oral communications skills. Please send résumés to: **G. Barksdale, Room J 129, Johnson & Johnson Products Company Inc., 501 George Street, New Brunswick, N.J. 08903.** A Johnson & Johnson Company, Leadership Beyond Compliance. Equal Opportunity Employer, M/F.

Senior Organic/Analytical Chemist

MRI, a not-for-profit research organization performs basic and applied research in chemical and biological sciences, economic, social and management sciences, and environmental energy and materials sciences for industry, governmental agencies, and other public and private groups.

Program expansion has created a technical management position as Project Leader, directing and coordinating technical staff (20+ members) efforts for analytical chemistry involving methods development for a wide variety of compound types. This position offers broad interface with the client.

The successful candidate will possess five or more years nonacademic experience in chromatography and spectroscopy in the characterization and purity assay of a wide variety of organic chemicals, with some inorganics and formulations. A proven record in project leadership and technical management of a program is required, in combination with a Ph.D. in Organic/Analytical Chemistry or equivalent training and experience.

MRI offers a climate enhancing your professional growth, state of the art laboratories, paid relocation, an excellent fringe benefits program, and competitive compensation. Our Kansas City location offers broad recreational and cultural opportunities in one of the lowest cost of living metropolitan areas of the country.

Pursue this challenging opportunity today by sending your resume, with complete salary history to Mr. Larry Brown at:



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Cardiovascular Pharmacologist

The Merck Institute for Therapeutic Research is presently searching for an innovative and creative scientist to work in cardiovascular research at our West Point research facilities. The applicant we are seeking should have a doctorate and be completing postdoctoral training and should be trained broadly in cardiovascular pharmacology or physiology, with a special interest in cardiotoxic research. An interest in the biochemical aspects of this area would be helpful.

The potential candidate's published work should reflect creativity and the ability to perform independent work, as the position is one which involves exploring new approaches to the understanding and treatment of cardiac failure.

The Merck Institute has always provided an exceptional environment for research, which includes, among other things, adequate laboratory space, modern equipment and technical support. Our research facilities are located in a rural setting, 25 miles NW of Philadelphia.

Please send Curriculum Vitae complete with publication record to:

Mr. George W. Brodhead
Personnel Manager

**Merck Sharp & Dohme
Research Laboratories**
West Point, PA 19486

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DIRECTOR, ANIMAL RESOURCES PROGRAM

The Division of Research Resources, National Institutes of Health, Public Health Service, invites nominations and applications for the senior-level management position of Director, Animal Resources Program (Health Scientist Administrator). The Animal Resources Program is responsible for the planning and operation of a national research resources effort in laboratory animal sciences, including diagnostic laboratories, animal models, and special colonies, research on laboratory animals, training and staff-development activities; and primate research, including the national primate research centers, a program for domestic primate breeding and similar activities. The Program Director is also one of the top advisors to the Director, Division of Research Resources, and participates in planning policy formation for the Division. This position will be filled at the GS-601-15 level (salary range: \$40,832 to \$50,000) or the Commissioned Corps.

This position requires a DVM, Ph.D., or equivalent degree in an academic field of health or pertinent sciences allied to health or health related research; expert knowledge in the field of animal research; knowledge of Public Health Service extramural activities and knowledge of grants policies and procedures; experience in dealing with institutions of higher education; superior writing and speaking skills; and a high degree of skill in inter-personal relationships, tact, and judgement.

It is desirable that applicants have experience with administering federal health research programs. In addition, all candidates must have demonstrated managerial/executive ability in setting program objectives and assessing progress toward those objectives (including implementation of equal employment opportunity).

Please send Personal Qualifications Statement (SF-171), current performance appraisal, curriculum vitae and bibliography to Ms. Pathenia A. Wiggins, Personnel Management Specialist, DRR Personnel Office, Building 31, Room 5B08, NATIONAL INSTITUTES OF HEALTH, 9000 Rockville Pike, Bethesda, MD 20205 by May 30, 1980. We especially encourage applications from minorities and women for this position. An Equal Opportunity Employer.

**NATIONAL INSTITUTES
OF HEALTH**

POSITIONS OPEN

UNIVERSITY OF PAPUA NEW GUINEA

Applications are invited for the post of **PROFESSOR OF PHYSICS**. The major responsibilities of the department are in undergraduate teaching, including relatively elementary service teaching for medical and agriculture students. Applicants should have a strong interest in the problems of teaching physics in Papua New Guinea at all levels covered in the university. The department also has an increasingly important role in training graduate science teachers and a particular interest in this aspect is considered desirable. Present research in the department includes aeronomy, meteorology/agricultural physics, and solid earth geomagnetism. The interests of the professor need not be confined to these areas but should be in the general area of applications of physics to the Papua New Guinea environment. Applicants should have wide research capabilities and extensive research experience in at least one appropriate area. Previous experience of teaching and research in a developing country in a tropical environment will be considered an advantage.

Salary: K18,730 per annum plus gratuity (£1 sterling = K1.53); 3-year contract. Support for approved research, rent-free accommodation, family passages, baggage allowance, overseas leave, education subsidies, and medical scheme. Applicants who wish to arrange secondment from their home institutions will be welcomed. Detailed applications (two copies), including curriculum vitae, a recent small photograph, and names of three referees, should be sent by airmail to: **The Assistant Secretary, Box 4820, University Post Office, Papua New Guinea**. Applicants resident in the United Kingdom U.K. should also send one copy to: **Inter-University Council, 90/91 Tottenham Court Road, London, W1P 0DT England**. Further details are obtainable from either address. Closing date: 30 May 1980.

RESEARCH SCIENTIST and COORDINATOR REMOTE SENSING CENTER

Faculty-level position within the Conservation and Survey Division, University of Nebraska, responsible for remote sensing applications programs, scientific research, and educational activities. Affiliated with State Geological Survey and Map Information Center. Ph.D. degree and experience related to natural resources preferred. Résumé and three letters of reference by 16 May 1980 to: **M. P. Carlson, University of Nebraska, 113 Nebraska Hall, Lincoln, Neb. 68588**. An Equal Opportunity Employer.

SENIOR RESEARCH BIOLOGIST

Zoecon Corporation is seeking a senior research insect endocrinologist to conduct basic and applied research leading to innovative and biorational insect-control agents. Requires a Ph.D. in insect biochemistry and physiology with excellent background in insect endocrinology. Preference will be given to individuals with industrial agricultural experience. Applicants must have 2 to 4 years of postdoctoral experience in insect endocrinological research with high level of proficiency in both microsurgical and biochemical techniques. Salary to be \$27,000 per annum. Submit curriculum vitae, professional references, and copies of major publications to: **Kathleen Moore-Holm, Zoecon Corporation, 975 California Avenue, Palo Alto, Calif. 94304**. An Equal Opportunity Employer, M/F.

WILDLIFE CENTER POSITIONS. Three people needed to join new wildlife zoo, hospital, and education center. Salary range for each is approximately \$12,500 to \$15,500. Positions open July 1980.

1) **ANIMAL CARE SPECIALIST.** Duties include the care and treatment of some 3000 disabled wild animals annually and participation in educational program, public relations, and other work related to operation of center. Qualifications include knowledge of basic veterinary procedures, parasitology, wildlife diseases, nutrition, and pharmacology.

2) **EDUCATOR.** Duties include operation of the interpretive program and other work related to the operation of the center. Qualifications include knowledge of native wildlife ecology and interpretive methods.

3) **WILDLIFE BIOLOGIST.** Studies release of rehabilitated animals and related wildlife problems in forest preserves. Participates in educational program, public relations, and other work related to operation of center. Qualifications include familiarity with native wildlife ecology and fieldwork.

Apply before 1 June 1980 with résumé, cover letter, grade transcripts, and three recommendations to: **Dr. Paul Beaver, Forest Preserve District of DuPage County, 881 West St. Charles Road, Lombard, Ill. 60148**.

POSITIONS OPEN

RESEARCH ASSOCIATE POSITIONS. A limited number of postdoctoral-level positions will become available in the University of North Carolina Dental Research Center in the summer or early fall 1980. The research programs in the center include the following general areas: mineralization and hormonal control of mineral metabolism; biochemistry of collagen and coagulation proteins; platelet physiology including membrane structure-function studies and the role of calcium and intracellular messengers in platelet function; biomaterials; periodontal diseases; histocytochemistry; developmental biology, including teratology; neural mechanisms, including pain; and clinically oriented studies related to craniofacial growth and treatment.

Additional information: These positions are designed to attract scientists in the early stages of their careers who desire research experience in a stimulating environment that emphasizes a multidisciplinary approach. Applicants are expected to be able to compete favorably for NIH postdoctoral fellowships or similar fellowships.

Applicants should send curriculum vitae and names and addresses of three references to:

**Dr. Philip F. Hirsch, Director
Dental Research Center 210H
University of North Carolina
Chapel Hill, N.C. 27514**

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

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) near Hyderabad, India.

SOCIAL ANTHROPOLOGIST (to be based in West Africa). To work with ICRISAT's team of biological and physical scientists and economists in West Africa. The appointee will help to design and execute household and village-level studies in Niger and Upper Volta, to provide a primary data base with time depth and regional variation, and to aid in the analysis of agricultural development and in the assessment of agricultural technology options. The appointee will also initiate additional studies contributing to regional program objectives. The appointment will be initially for 2 years with the possibility of further extension. Qualifications: Ph.D. in social anthropology or closely related discipline is required; experience in applying the principles of social anthropology to problems of agricultural development is desirable. Fluency in French is required. As English is the official language of the Institute, a good background in English is necessary. Persons without the doctorate may qualify for research scholar or other appointments.

Salary commensurate with qualifications and experience; excellent fringe benefits.

Send résumé with names of three references by 31 May 1980 to: **Director General, ICRISAT, ICRISAT Patancheru P.O., Andhra Pradesh, 502 324 India**.

WORKSHOP

FORUM AND WORKSHOP ON BARRIER ISLAND MANAGEMENT—27 to 30 May 1980. The National Park Service and the Provincetown Center for Coastal Studies are sponsoring a Public Forum and Workshop for Land Managers on Barrier Islands, to be held at the Provincetown Inn, Provincetown, Mass., adjacent to Cape Cod National Seashore. Local scientists and environmentalists will address coastal zone management, barrier island development and recreational uses, coastal engineering and storm preparedness, augmented by field trips. Attendance and participation is by reservation only on a first-come, first-served basis. Write: **Provincetown Center for Coastal Studies, 59 Commercial Street, Provincetown, Mass. 02657, or telephone 617-349-3785**.

GRADUATE STUDY

The Department of Biochemistry at The University of Texas Health Science Center at San Antonio invites applications for **GRADUATE TEACHING ASSISTANTSHIPS** for fall 1980. The department has vigorous research programs that cover a wide range of biochemical areas leading to the Ph.D. degree and is well equipped for research. Stipends for a 12-month period begin at \$5400. For more information, write to: **Dr. Paul Horowitz, Department of Biochemistry, The University of Texas Health Science Center, San Antonio, Texas 78274**. An Equal Opportunity/Affirmative Action Employer.

GRADUATE STUDY

GRADUATE STUDY IN ARCHAEOLOGICAL SCIENCE. The Institute of Archaeology, University of London, invites applications from individuals wishing to register for master's degrees and research degrees (M.Phil., Ph.D.) in archaeological science. Fields of research and teaching include ancient metallurgy and materials science, zooarchaeology, resource utilization and other aspects of environmental archaeology, computing and numerical techniques in archaeology, and archaeological conservation. Further details from: **The Registrar, Institute of Archaeology, 31-34 Gordon Square, London WC1H 0PY, England**.

ASSISTANTSHIPS

GRADUATE ASSISTANTSHIPS

Graduate assistantships in field biology, fisheries, and cell biology will be available to M.S. students in May and August 1980. Research areas include: fish physiology, ecology, and management (sport and commercial fisheries); parasitology, algal ecology, water quality, bacterial genetics, plant systematics, herpetology, and wildlife management. Inquiries regarding other areas welcome.

Send résumés, transcripts, GRE scores, letters of reference, and inquiries to:

**D. W. Johnson, Director
Hancock Biological Station
or
Marion Fuller, Graduate Coordinator
Biology Department
Murray State University
Murray, Ky. 42071**

FELLOWSHIPS

HYPERTENSION RESEARCH FELLOWSHIPS.

Fellowships in hypertension research for 2 years, for qualified applicants, are available at the Mayo Clinic and Mayo Graduate School of Medicine. This NIH-funded multidisciplinary program provides research training in hypertension by faculty in nephrology, endocrinology, cardiovascular diseases, pharmacology, pediatrics, biochemistry, and physiology. Applicants should have the M.D. or Ph.D. degree and hold a permanent visa if not a citizen of the United States. Degree programs leading to the master's or Ph.D. degrees are available to individuals with the M.D. degree. For further information, write to: **R. M. Weinshilboum, M.D., Director, Multidisciplinary Hypertension Research Training Program, Mayo Clinic, Rochester, Minn. 55901**.

Mayo Foundation is an Equal Opportunity/Affirmative Action Institution.

POSTDOCTORAL FELLOWSHIP positions available for M.D./Ph.D.'s wishing to pursue a research program in reproductive endocrinology for a period of 2 years. Inquiries and curriculum vitae should be sent to: **P. C. MacDonald, M.D., Director, Cecil H. and Ida Green Center for Reproductive Biology Sciences, University of Texas Southwestern Medical School, 5323 Harry Hines Boulevard, Dallas, Texas 75235**.

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Will design, construct, and execute experimental and theoretical studies in the fundamental nature of flow cytometry. Requires a Ph.D. in Biophysics or a similar field together with at least five years of experience related to quantitative cell analysis. Successful candidates must have a thorough background in the design and analysis of experimental studies. Experience with electro-optical methods, fluorescent analysis and mathematical modeling would be helpful.

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an affirmative action employer.

TECHNICAL SERVICE MANAGER

P-L BIOCHEMICALS, INC. has an immediate opening for a Technical Services Manager. This is a new position related to our continued growth as a leading producer of enzymes, nucleotides, and related products for biochemical research.

The position encompasses two major areas; product related technical publications and liaison with research institutions to advise on technical matters and develop new product concepts.

The successful candidate will be a problem solving individual who likes to work with people. Qualifications include Ph.D. degree in biochemistry with emphasis in molecular biology, enzymology or related field.

If you would like the challenges and rewards offered by this position, please send your resume and salary requirements, in confidence, to Mr. Melvin E. Ebeling, Director of Marketing,



P.L. biochemicals, inc.
1037 WEST MCKINLEY AVENUE, MILWAUKEE, WIS. 53205

An Equal Opportunity Employer M/F

OPPORTUNITIES CREATED BY GROWTH. GROWTH CREATED BY EXCELLENCE.

Abbott Laboratories, an international leader in the development, manufacture and marketing of sophisticated health care products, has been growing at a steady pace. In 1980, our momentum should carry us to the \$2 billion mark in worldwide sales. And our success has created openings for individuals to work in the following areas:

RESEARCH & DEVELOPMENT

IMMUNODIAGNOSTICS

- Bacterial/eucaryotic cell culturing
- Antigen purification
- EIA and RIA procedures
- Systemics research involving endotoxins & lipopolysaccharides

ANTIBIOTIC RESEARCH PROJECTS

PRODUCTION OPERATIONS

STERILIZATION TECHNOLOGY

- Sterilization cycle development
- Biological validation procedures
- Sterility testing

FERMENTATION PROCESS DEVELOPMENT

QUALITY ASSURANCE

- Microbial analysis of incoming, in-process and finished products

BIOCHEMISTRY

- Development/implementation of immuno-assays for diagnostic kits
- Technical support positions involving process development

MEDICINAL CHEMISTRY

- Organic synthesis projects using Chromatography, IR, and NMR spectra

ANALYTICAL CHEMISTRY

- Methods development for analysis of bulk drugs, intermediates and chemicals

INFORMATION RESEARCH

- On-going antibiotic and cardiovascular research projects requiring literature evaluations

We offer an excellent salary and full benefits package that includes profit sharing and relocation assistance. If you have a degree in Biochemistry, Chemistry, Biology, Microbiology or a related field (MS or Ph.D. preferred), we invite you to explore these growth opportunities today. Send a resume with salary history in confidence to:

S. Gude, Corporate Placement

ABBOTT
NORTH CHICAGO, ILL. 60064

Abbott is an Affirmative Action Employer

Delighted to have been of service

If we are going to be thumping our chest in exultation over our centennial, let's try to do it in a useful way instead of belaboring the obvious. Certainly it is not obvious to outsiders, aware of gene-splicing and genetic engineering only as hot topics, that the literature the insiders write and read should mention our name over and over.

The talky ad shown below appeared when we were only 82 years old. The ad had more scientific than business impact. The illustration shows macromolecules separated in acrylamide gel by difference of mobility in an electric field. It advertised the idea. Readers were invited to send for the theory and the working details. Not that we had created anything. The authors were two bioscientists who didn't work for us but accepted our offer to submit their method swiftly in full detail for the scientific community to try out. They called it disc electrophoresis. We justified our small part in the hope it would sell Eastman organic chemicals for preparing and working with the gel.

This unconventional form of scientific communication by paid advertising—prepublication we called it—accomplished in full measure all we had hoped. It has turned out that:

1 Though the cylindrical form still offers some advantage, most gel electrophoresis today is done in rectangular slabs where two dimensions of migration are available and the thickness dimension is subsequently used for

spraying betas from radionuclide-labeled spots onto film in contact for autoradiography.

2 The way molecular biology is moving today those spots often as not represent individual gene products that some living cells have been fooled into manufacturing through the use of restriction enzymes in recombinant experiments that either approach fundamental problems of biology as exercises in code-breaking or else seek slicker ways of manufacturing valuable molecules than are described in organic chemical textbooks.

3 When the labeled products are still so scanty as to be flirting with the detection limits for direct autoradiography, incorporation of fluors into the gel causes light to take over the job of exposing the film, which helps greatly.

4 What proves equally necessary in using the feeble betas from tritiated material is to expose at around -78° so that the first atom or two of silver at a sensitivity speck on a silver halide crystal does not diffuse away before more arrive—the cause of reciprocity failure.

5 An earlier contribution from photographic science has also helped. The sigmoid shape of the plot of optical density vs log exposure has correctly predicted that preflashing the film to get above the toe of the curve would

gain sensitivity and linearity.

6 From the view at the lab bench, our most appreciated contribution to the work has proven to be some very high-grade x-ray films we make for the world's medical centers. Meanwhile one recent paper (*Analytical Biochemistry* 93, 189-195 [1979]) shifts attention to Kodak Ektacolor or Vericolor film for experiments using multiple isotopes and using color on a single sheet of film to see where they each end up. Films and their processing are what get us mentioned so often in the current literature of the subject.

If contemplating a jump onto the capacious bandwagon of recombinant studies, you may wish to ask E. J. Hahn, Health Sciences Markets Division, Kodak, Rochester, N.Y. 14650, phone 716-724-4633, for the latest edition of his product guide and bibliography entitled "Autoradiography of Large-Area Specimens."

1880  1980

A 100-year start on tomorrow

(1962)

Kodak reports on:
what to do till the flying-spot scanner comes...light-sensitive liquids for less-than-juicy volume...
why there are several spectrochemical emulsions

Disc electrophoresis



Each of the dark discs in this little tube of gel represents a different protein in a 3-microliter sample of normal human serum. The separation was effected in 30 minutes. The pattern tells a detailed story to the practiced eye. The equipment can be jerry-built in the laboratory for a materials outlay of about \$12.* The chemicals we recommend are N, N'-Methylenebisacrylamide (Eastman...stabilized, grate-

Mount Sinai Hospital Cell Research Laboratory in New York City have extended electrophoresis in the directions of 1) more simplified equipment that gets you into the technique easily; 2) more sophisticated equipment that speeds and refines results once you have found the technique indispensable; 3) a clear (albeit concentrated and mathematical) exposition of the physical chemistry at work.

We propose a little experiment in casting bread upon the waters. We shall come how many will accept an offer hereby made by Distillation Products Industries, Rochester 2, N. Y. (Division of Eastman Kodak Company), to send a free preprint of a paper by Dr. Ornstein on the theory and a fully illustrated set of directions by Dr. Davis on how to proceed. Then we shall wait and count how many orders come in for the above-named Eastman Organic Chemicals. The results of this experiment you will never know.

Never say "die"?



These metal parts are not stampings. They were they cut out by knife, scissors, or they are too fussy.

do it for hire. The method uses either Kodak Photo Resist or Kodak Metal-Etch Resist, depending on the metal to be worked. Both are light-sensitive liquids. The object is drawn to enlarged scale and photographed. The metal is coated with KPR or KMER and exposed to light through the negative. Where the negative subsequently flush light, the resist will subsequently flush away; where light-struck, it becomes resistant to an etchant. Etchants leave no burrs. The thinner the metal the closer an etchant can work within tolerance. Designers can keep changing their minds, fancy-free, with less peril to their budgets, if any.

Eastman Kodak Company, Graphic Reproduction Division, Rochester 4, N. Y., can provide all sorts of information about photo-etching. We even hold seminars on the subject.

The grateful but cautious spectrographer

A small pamphlet has been issued under the title "Spectrum Analysis with Kodak Materials." The words it contains may prove less useful than its graphs and numbers, though the words devoted to a warning against taking the graphs and numbers too seriously must be taken seriously. That's life.

Life lived with the photographic emulsion as a measuring instrument for radiation intensity must be filled with gratitude for its simplicity, versatility, and economy and filled with caution against glib assumptions. Those who live that life have learned that:

1) Kodak Spectroscopic Plates and Type 103-0 work fast, capture