

GENETICS OF SEX DIFFERENTIATION

by URSULA MITTWOCH

This landmark study puts forth the theory that the difference between the sexes is determined—not by genes—but by chromosomal regions controlling the rate of fetal growth. Dr. Mittwoch shows how the nongenic regions of the sex chromosomes affect sex differentiation by controlling the rate of cell division, which in turn regulates the rate of growth in the developing gonads. Dr. Mittwoch has arrived at her conclusions by first examining the classic concept of the genetics of sex differentiation, including the theory of genic balance. She then briefly outlines the development of the genetics of continuous variation and of the gene, and discusses in more detail the role of heterochromatin in sex differentiation. Other chapters describe the nature of sex differentiation (especially in vertebrates), as well as the constitution of normal—and the effects of abnormal—sex chromosomes in man and other mammals. The final chapter deals with the effects of chromosomal changes on growth, differentiation, and sexual development.

1973, 256 pp., \$16.50

TISSUE CULTURE

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edited by PAUL F. KRUSE, Jr., and
M. K. PATTERSON, Jr.

Featuring the work of more than 180 well-known investigators from all over the world, this volume demonstrates the most significant and up-to-date techniques for culturing vertebrate, invertebrate, and plant cells and tissues. The book begins by demonstrating basic techniques for tissue dissociation and goes on to describe the best procedures for establishing primary cultures of cells. Other aspects of cell and tissue culture covered include the following: efficient harvesting, isolation, cloning, and replication of cells; system automation, regulation of the culture environment, and working with large quantities of cells; cell propagation on supports other than glass and plastic; evaluating the progress and behavior of cells in culture, including cell enumeration and viability of cell cycle analysis; application of the latest developments in light and electron microscopy to tissue culture; and quality control measures in the tissue culture laboratory.

1973, 890 pp., \$22.00

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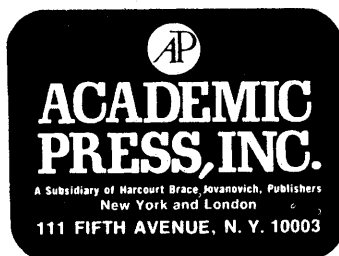
Their Mathematical Analysis

by THEODOSIOS PAVLIDIS

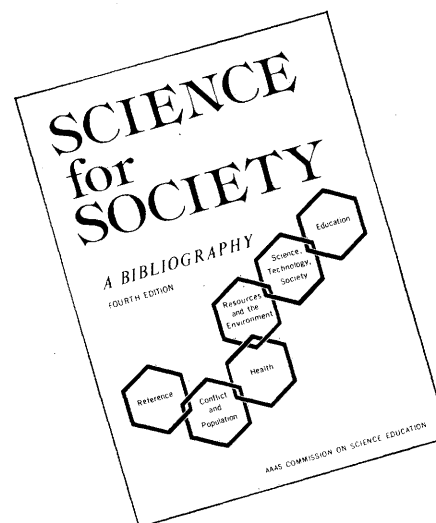
Biological oscillators seem to be present in many living systems, and their study requires analytical rather than descriptive techniques; however, they present special problems that are not shared by oscillators in technological applications. The book studies some of these special features of biological oscillators and the mathematical techniques required for their analysis, giving special emphasis to the study of circadian oscillators and their models. Topics discussed include: phase shifts and phase response curves; entrainment by external inputs; effects of changing environment on the dynamics of such oscillators; and populations of interacting oscillators. The book also includes a bibliography of over 300 references and many examples of computer simulation.

1973, 224 pp.,
\$19.00

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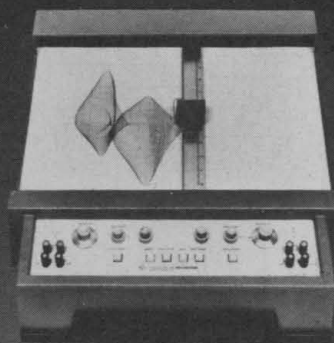
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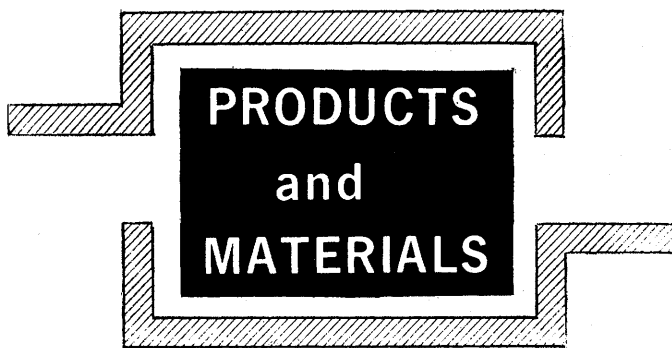


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Muscle pH Monitor

A system comprised of the Ionalyzer pH meter, model 408, and three miniature electrodes enables the continuous monitoring of acid-base status and tissue perfusion. The electrodes' size and shape permits insertion with small incisions and provides good muscle contact. The system is portable, compact, and free of electric shock hazards. The system gives resolution to 0.01 pH unit from 6 to 8. Convenient thumb wheels control function, temperature compensation, and calibration. Orion Research, Incorporated. Circle No. 139 on Readers' Service Card.

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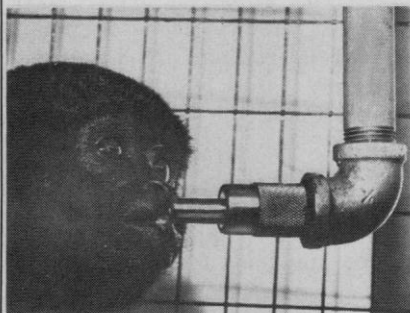
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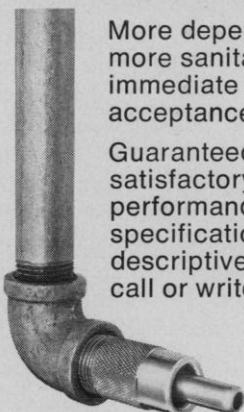
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Thelco Ovens and Incubators describes applications and gives specifications and performance data for more than a dozen models including gravity ovens, vacuum ovens, forced-circulation ovens, carbon dioxide incubators, and anaerobic incubators. GCA/Precision Scientific. Circle No. 144 on Readers' Service Card.

Environmental Equipment Catalog features laboratory and production models of ovens, test chambers, and incubators. Walk-in and reach-in types and models designed for electronic, chemical, and metal processing are described. Hotpack Corporation. Circle No. 145 on Readers' Service Card.

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General Manager, V.P., director. Ph.D. microbiology. Experience: production, quality control, R & D, marketing. Health fields: biologicals, diagnostics, pharmaceuticals. Desires management, R & D, quality control, or academic administrative position. Box 514, SCIENCE. 11/9

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A complete curriculum vitae and three letters of reference should be directed to **Dr. Joe L. Key, Chairman, Division of Biological Sciences, University of Georgia, Athens, Georgia 30602.** The University of Georgia is an equal opportunity employer.

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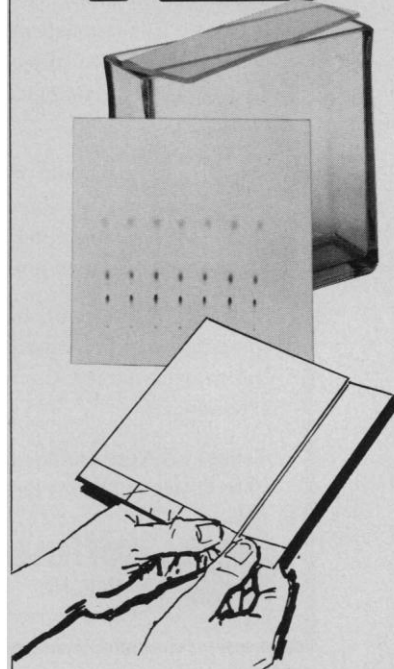
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All candidates who meet the above qualifications are urged to apply irrespective of race, sex, or ethnic origin.

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Submit résumé, salary history and requirements in strict confidence to: **Dr. Robert F. Inger, Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, Illinois 60605.**

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GENETICIST—ASSISTANT PROFESSOR

We seek candidates qualified to teach at the undergraduate and graduate level and to establish and maintain a strong graduate research program. Applicants in the areas of developmental, population, or radiation genetics preferred. We invite applications from members of minority groups. Salary open. Ph.D. required. Applicants should send curriculum vitae, three reference sources, and recent reprints to **Dr. Nicholas C. Palczuk, Chairman, Department of Zoology, Rutgers University, New Brunswick, New Jersey 08903.**

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PROFESSOR OF GENETICS

Applications are invited from men and women for a senior position at the full professorial level in the area of genetics, preferably with research interests in the field of plant genetics. Applicants will be expected to have demonstrated substantial and continuing research productivity and to provide evidence for national and international recognition commensurate with a professional appointment at a major university. Ability to direct both graduate and undergraduate students and interest in teaching at these levels are also desirable.

To apply, submit an academic biography, a list of publications, and a detailed letter describing accomplishments and plans for and philosophy of future research. The institution concerned is an equal opportunity employer and encourages applications by candidates of all races and ethnic backgrounds which should be submitted to: **Dr. C. H. W. Hirs, Director, Division of Biological Sciences, Indiana University, Bloomington, Indiana 47401.**

UNIVERSITY OF WINDSOR WINDSOR, ONTARIO, CANADA

Applications are invited for: **HEAD, DEPARTMENT OF BIOLOGY**

Applicants are expected to have a distinguished record in research and teaching. Duties include administration of a 16-member department which offers undergraduate and graduate courses (though doctoral level) in a broad spectrum of biological sciences; fostering the development of research programs; and participation in research and teaching.

The appointment commences 1 July 1974. Salary to be negotiated according to qualifications and experience.

Please send application, curriculum vitae, names of at least three referees, and other pertinent information to: **Chairman of Selection Committee, Department of Biology, University of Windsor, Windsor, Ontario, Canada.**

**UNIVERSITY OF CALIFORNIA, BERKELEY
DEPARTMENT OF GEOLOGY AND
GEOPHYSICS**

A vacancy is anticipated for an Assistant Professor whose research interests lie in the genesis of metamorphic rocks. In addition to teaching graduate and undergraduate courses in metamorphic petrology, the successful candidate will be required to teach field mapping techniques, including from time to time, the summer field course. Candidates, who should have received their Ph.D. degrees within the last 4 years (or expect to do so in 1974), should send their applications, together with copies of their published research to: **Professor I. S. E. Carmichael, Department of Geology and Geophysics, University of California, Berkeley, California 94720.** Closing date for applications is 1 December 1973. *The University of California is an equal opportunity employer with an affirmative action program.*

**HEAD, DEPARTMENT OF
VETERINARY MICROBIOLOGY**

The Western College of Veterinary Medicine, University of Saskatchewan, invites applications for the position of Head of Department of Microbiology, effective 1 July 1974.

The successful candidate will have teaching and research experience, have achieved international recognition in a specific area of microbiology and be able to give leadership to a dynamic department. D.V.M., Ph.D., and administrative experience are expected.

Please send résumé and names of three referees to: **Dr. D. L. T. Smith, Dean, Western College of Veterinary Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada, S7N 0W0.**

**UNIVERSITY OF WASHINGTON
INSTITUTE FOR MARINE STUDIES**

The Institute for Marine Studies of the University of Washington is considering faculty appointments to positions in marine policy studies. Consideration is to be given to persons with interdisciplinary training and experience pertinent to the subject areas of coastal zone planning and management; international marine policy and management; marine resource development and management; marine transportation and commerce; naval power, national security, and foreign policy; and off-shore technology systems. Résumés, including list of publications and references, may be sent to **Director, Institute for Marine Studies, University of Washington, Seattle, Washington 98195.**

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LIMNOLOGIST

Postdoctoral research associate for a watershed study. Experience in limnology and water chemistry required. Salary \$10,000 for 12 months. Send curriculum vitae to:

**Dr. Robert Harris
505 PS/A Building
Florida State University
Marine Laboratory
Tallahassee, Florida 32306**

Ph.D. METEOROLOGIST

The Department of Meteorology at the Pennsylvania State University is seeking candidates for faculty appointments in several branches of atmospheric science. Openings exist for specialists in synoptic and applied meteorology, in dynamics and numerical weather prediction, and in areas associated with scientific and mathematical analysis of problems related to atmospheric quality, and climatic evolution. A Ph.D. degree (or equivalent or in progress) is required. Faculty rank and salary will be commensurate with the experience and accomplishments of successful candidates. Interested persons should write promptly to the **Department in care of Professor John A. Dutton, 503 Deike Building, University Park, Pa. 16802.** *The University is an equal opportunity, affirmative action employer.*

MICROBIOLOGIST

Position available 1 January 1974 at the Assistant or Associate Professor level. Duties include teaching courses in microbial physiology and general microbiology and a graduate level course of the applicant's choice. Development of an active research program is also expected. Please send curriculum vitae and names of three references to **Chairman, Microbiologist Search Committee, Biology Department, Southern Illinois University, Edwardsville, Illinois 62025.**

MODELLER, US/IBP

Applications are invited for the position above from persons with a good background in ecology and computer science, and experience in modelling complex systems. M.S. preferred but not required. Send résumés to:

**Dr. Paul Lommen or Dr. Clayton Gist
Ecology Center
Utah State University
Logan, Utah 84322**

**— Ph.D. —
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Our Animal Health Products Division has established a new research position in its expanding ruminant nutrition program. The individual sought will have the opportunity to conduct fundamental investigations on the metabolism of nutrients in the rumen, and to develop methods for changing the outflow of nutrients from the rumen.

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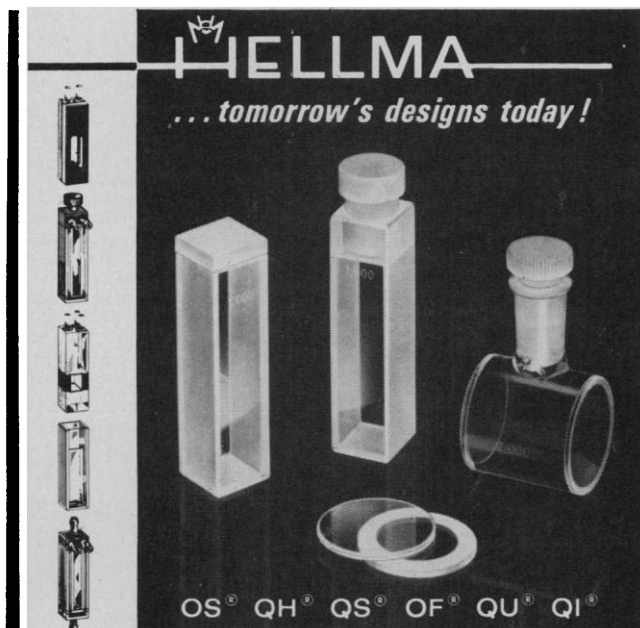
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**ATTACH
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The National Cancer Institute is soliciting source information from organizations having the technical capability and interest to provide research and management support in the program on etiology of pancreatic and other digestive organ adenocarcinomas. This Program has as its major goal the understanding of the etiology of this disease, with an end point nothing less than a scheme to prevent cancer of the pancreas. This requires evaluation of the available knowledge, the state of the art, identification of reasonable goals, and constant updating of research priorities. The NCI is interested in developing a mechanism to assist in administering this program.

The contractor will establish a team of professional personnel knowledgeable in pancreas and digestive organ anatomy, pathology, physiology and biochemistry and carcinogenesis in general and then perform functions to arrive at periodic recommendations to the NCI Program. Activities would include, but not be limited to:

- 1) Recommending new projects to be initiated based upon existing knowledge.
- 2) Assisting in review and evaluation of new projects relevant to this program.
- 3) Recommending modifications of existing projects based upon review of state of the art and current performance.

After becoming thoroughly familiar with the program and NCI responsibilities and operations, the contractor will be expected to submit to NCI a proposal for phasing this contract into a Prime Contractor relationship with the intent of maximizing the attainment of Program goals. If and when such a relationship develops, the contractor should have available laboratory space suitable for selected research projects relevant to pancreas adenocarcinoma.

To qualify, organizations must have available the following:

- 1) Scientific research and research management personnel to serve as staff for the project.
- 2) Technical and professional capability in experimental or clinical research with human and/or animal disease preferably dealing with pancreas and/or cancer as well as research management.
- 3) Availability of adequate office space and availability of laboratory space for future requirements.

Organizations having demonstrated capability and experience in the above areas and desiring consideration for "Requests for Proposals" are invited to submit a concise but complete résumé describing and specifically responding to the items outlined above.

Other pertinent information should also be included such as evidence of previous experience in projects of comparable scope and diversity and indication of any previous institutional experience in management of a large research program.

All capabilities and experience do not necessarily have to be represented totally in one organization, although one prime respondent must be indicated and written evidence of a commitment from any proposed subcontractors or key personnel to be hired is necessary for consideration.

This is not a request for proposal. Responses will be technically evaluated to determine R & D capabilities and potential sources for solicitation. Responses must be submitted to Mr. James L. Tidmore, Contract Specialist, Research Contracts Branch, National Cancer Institute, Landow Building, Room B-401, Bethesda, Maryland 20014, and must be received no later than 14 December 1973. Sources must reference No. 137. This number must be clearly shown.

POSITIONS OPEN

MEDICAL DIRECTOR

Physician to become Medical Director of 4-year degree Physician's Assistant Program with 170 students. Teaching experience, especially in clinical medicine and surgery desired, but not required. Practice opportunities also available. Salary negotiable.

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PHYSIOLOGIST

Assistant Professor of Anatomy and Physiology. Ph.D. in Physiology with a support of Human Anatomy. Position: undergraduate teaching with research encouraged. Send credentials to:

Head of Science Division
Northeast Missouri State University
Kirksville, Mo. 63501

PRESIDENT UNIVERSITY OF OREGON HEALTH SCIENCES CENTER Portland, Oregon

This newly created operating unit of the Oregon State System of Higher Education comprises the professional schools of medicine, dentistry and nursing, and numerous additional programs in the health sciences area. An active search is under way for a chief executive officer of the complex who will report to the Chancellor and Board of the State System of Higher Education.

A representative committee has been appointed by the Board to formulate a list of nominees. The committee is seeking persons with extensive academic and administrative experience who can lead this new unit in the coordinated development of educational, research and service programs in the health sciences and health care delivery. The person selected will work through the deans and faculties of the various schools comprising the unit, and must interact effectively with public and private agencies at the community, state and national levels. The new office will be activated on 1 July 1974.

Interested persons, independent of race, religion, color, sex, or national origin, are invited to provide biographical information directly to the committee's secretary, Mrs. Mary Ann Lockwood, University of Oregon Medical School, Portland, Oregon 97201, Equal Opportunity Employer.

The New York State Research Institute on Alcoholism seeks senior Research Scientists for a multidisciplinary research program in alcoholism, alcohol abuse and nonmedical drug use. Senior positions are available in the areas of medical/clinical research on the prevention of the chronic toxicities of ethanol and in the development of valid instruments for the evaluation of treatment efficacy. The Research Institute is affiliated with the State University of New York at Buffalo; a joint appointment with an academic department is encouraged for qualified candidates. Send curriculum vitae and bibliography to Cedric M. Smith, M.D., Director, Research Institute on Alcoholism, 1021 Main Street, Buffalo, New York 14203.

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WILDLIFE BIOLOGIST

Faculty position available September 1974 for experienced individual with doctorate to teach, conduct research, and coordinate an established academic program in Wildlife Biology. Rank and salary open. Applications should include a curriculum vitae. Three letters of reference solicited by the candidate should be sent directly to Professor R. A. Parker, Search Committee Chairman, Department of Zoology, Washington State University, Pullman, Wash. 99163. An Equal Opportunity Employer.

X-RAY DIFFRACTION OF MEMBRANES

Ph.D. for permanent position (\$10,155 per annum) in November 1973 in small and wide angle diffraction. Good physical and mathematical understanding of diffraction and computing essential. Also, involves purification and E.M. of cancer membranes. Position will develop in salary and responsibility to independent unit with own grants and students. Send curriculum vitae to: Dr. D. F. Parsons, Roswell Park Memorial Institute, 666 Elm Street, Buffalo, New York 14203.

FELLOWSHIPS

DOCTOR OF ARTS IN BIOLOGY

Applications for predoctoral fellowships are being accepted now for qualified students interested in studying for the Doctor of Arts degree in Biology. Applicants must hold M.S. degree in Biology or its equivalent prior to the fall 1974 term. For details of this new program and application materials write to: Chairman, Department of Biology, Idaho State University, Pocatello, Idaho 83201.

Predoctoral Fellowship in Neurobiology in the Boston University Marine Program, located at the Marine Biological Laboratory (MBL), Woods Hole, Mass., beginning 1 September 1974. The fellow will be a degree candidate in Boston University. The BU staff in residence at MBL includes F. Long and E. F. MacNicol, Jr. Preference will be given to candidates who will have completed a Master's degree in the field of neurobiology. Application deadline is 1 February 1974. For further information and application forms write: Director, Boston University Marine Program, MBL, Woods Hole, Mass. 02543. (Telephone: 617-548-3705, Ext. 519.)

THREE POSTDOCTORAL FELLOWSHIPS IN THE EARTH AND PLANETARY SCIENCES

The Lamont-Doherty Geological Observatory of Columbia University invites scientists interested in any field of the earth and planetary sciences to apply for the fellowships.

Two postdoctoral fellowships, each awarded for a period of 1 year (extendable to 2 years in special instances) beginning in September 1974, with a stipend of \$12,000 per annum. One senior postdoctoral fellowship, the stipend and term of the award to be arranged to suit the special requirements of the successful applicant. Completed applications are to be returned by 15 February. Announcements will be made 31 March.

Application forms may be obtained by writing to the Director, Lamont-Doherty Geological Observatory, Palisades, N.Y. 10964.

REQUEST FOR PROPOSAL

It is the intention of the Carcinogenesis Area of the National Cancer Institute to advertise the availability of two Requests for Proposals entitled "Identification of Site of Origin of Human Pancreatic Adenocarcinoma" (RFP No. N01 CP C 43232) and "End Points for in vitro Carcinogenesis without Transplantation to Syngeneic Hosts" (RFP No. N01 CP C 43233).

Individuals representing research organizations who wish to receive a copy of these Requests for Proposals when they become available (RFP issue date 15 November 1973) are invited to submit their names to the following address:

Mr. J. L. Tidmore (301-496-1781) National Cancer Institute, Cancer Cause and Prevention Contracts Section, Research Contracts Branch, National Institutes of Health, Landow Building, Room B-401, Bethesda, Maryland 20014

Proposals in response to RFP N01 CP C 43232 are due 3 January 1974 and proposals responding to N01 CP C 43233 are due 4 January 1974.

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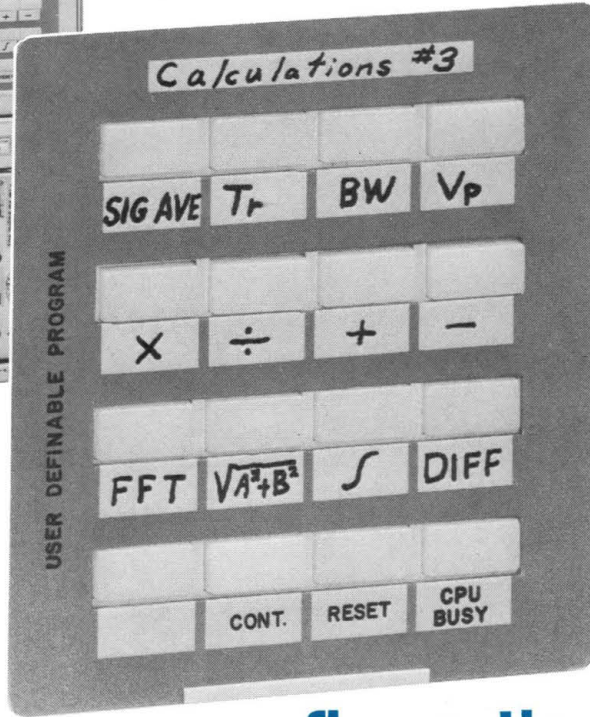
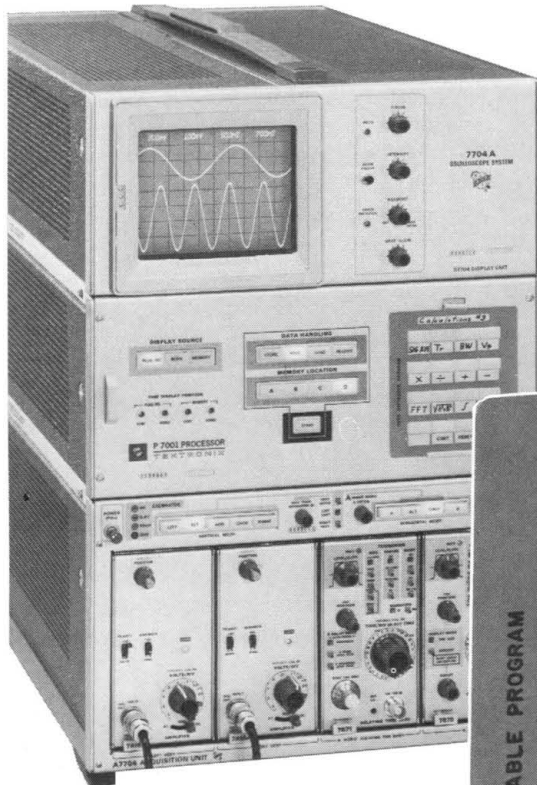
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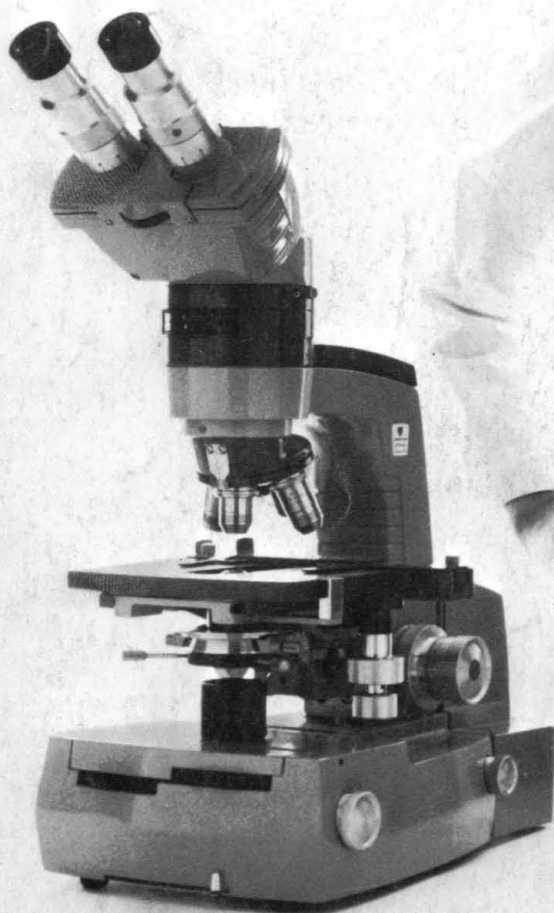


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