

## AGING . . .

### Some Social and Biological Aspects

A symposium presented at the AAAS  
Chicago Meeting

December 1959. Published November 1960.

Nathan V. Shock, Editor  
6 x 9, 436 pp., 65 illus., cloth  
\$8.50 AAAS members' cash orders \$7.50

#### CONTENTS

**Implications for society:** J. W. McConnell, J. T. Freeman,  
R. J. Havighurst, C. D. Leake, S. Spector

**Aging in tissues and cells:** B. Glass, J. D. Ebert, G. H.  
Bourne, A. White

**Aging in the total organism:** M. Landowne, G. Pincus, P.  
Handler, E. W. Busse

**Theories of aging:** N. W. Shock, H. Selye, P. Prioreschi,  
B. L. Strehler, J. E. Birren, S. E. Stumpf

**Oral aspects of aging:** R. F. Sognnaes, A. A. Dahlberg,  
J. Nalbandian, J. Klingberg, L. Cancellaro, E. O.  
Butcher, J. R. Ring

**Financing medical costs after age 65:** J. T. Freeman

**Discussions. Index**

British agents: Bailey Bros. & Swinfen, Ltd.  
Warner House, 48 Upper Thames Street  
London E.C.4

**American Association for the  
Advancement of Science**

1515 Massachusetts Ave., NW  
Washington, D.C. 20005

## THE AUSTRALIAN NATIONAL UNIVERSITY INSTITUTE OF ADVANCED STUDIES

### Department of Astronomy

Applications are invited for a position on the academic staff of the Mount Stromlo Observatory, at the level of Senior Fellow. The Director of the Observatory is Professor Bart J. Bok. Applicants will be expected to have had several years' research experience in some branch of astronomy. The work of the Observatory has so far been mainly observational, with emphasis on high dispersion spectroscopy, galactic structure, the Magellanic Clouds and radio sources. It is, however, hoped to build up a theoretical division, and careful consideration will be given to an applicant with a primarily theoretical background.

The successful applicant will become a full member of the academic staff of the Australian National University. He will be expected to devote his time to the prosecution of independent research, including possibly assistance with the training of graduate students.

The salary and range of a Senior Fellow are determined within the limits £A3,300-3,850 and of a Fellow within the limits £A2,400-3,300. Initial salary will depend on qualifications and experience. Appointment is made for an initial period of five years; thereafter he may be re-appointed until retiring age. A Senior Fellow is entitled to one year's study leave on full pay, plus a contribution towards travel and other expenses, in every six years of service, and a Fellow in every seven years. At present the maximum grants are £A1,300 (Senior Fellow) and £A1,080 (Fellow).

Superannuation is on the F.S.S.U. pattern with supplementary benefits. Reasonable travel expenses are paid and assistance with housing is provided.

Further particulars should be obtained from the undersigned, with whom applications close on 2 November 1964, or from the Director of the Observatory.

P.O. Box 4,  
CANBERRA A.C.T.

D. K. R. HODGKIN, Registrar  
Institute of Advanced Studies

## MELPAR'S Research Division has IMMEDIATE OPENINGS FOR . . .

- BIOCHEMISTS      ■ BIOPHYSICISTS
- VIROLOGISTS      ■ MICROBIOLOGISTS
- IMMUNOLOGIST-IMMUNOCHEMISTS

Melpar, an expanding and progressive industrial research organization in the Washington, D.C. area, has a fast moving program of research in a wide range of scientific disciplines. There is an immediate need for scientists and instrumentation engineers who have an active interest and experience or training in:

- Antigen-Antibody Reactions
- Bacterial Physiology
- Enzymatic Mechanisms & Kinetics
- Enzyme Active Site Studies
- Microbial Genetics
- Nucleic Acid Studies
- Virus Physical Properties
- Viral Host Parasite Interaction
- Biochemical Processors
- Electrochemical Monitors
- Fluorescence Instrumentation
- Optical Design
- Collection & Fractionation Systems

#### BIOPHYSICAL MEASUREMENTS

#### BIOCHEMICAL MEASUREMENTS

#### ELECTRO-OPTICS

Qualified persons who are interested in participating in challenging projects ranging from basic research to the exploration of life detection techniques are invited to submit resumes to:

Clarence Endsley—Professional Placement

**MELPAR INC**

A SUBSIDIARY OF WESTINGHOUSE AIR BRAKE COMPANY

3463 Arlington Blvd. Falls Church, Va.  
an equal opportunity employer

# PERSONNEL PLACEMENT

**CLASSIFIED:** Positions Wanted. 25c per word, minimum charge \$4. Use of Box Number counts as 10 additional words. Payment in advance is required.

**COPY** for ads must reach SCIENCE 2 weeks before issue date (Friday of every week).

**DISPLAY:** Positions Open. Rates listed below—no charge for Box Number. Rates net. No agency commission allowed for ads under 4 inches. No cash discount. Minimum ad: 1 inch. Ads over 1 inch will be billed to the nearest quarter inch. Frequency rate will apply only to repeat of same ad. No copy changes. Payment in advance is required except where satisfactory credit has been established. Send copy for display advertising to SCIENCE, Room 1740, 11 West 42 St., New York 36.

Single insertion	\$65.00 per inch
4 times in 1 year	60.00 per inch

For PROOFS on display ads, copy must reach SCIENCE 4 weeks before date of issue (Friday of every week).

Replies to blind ads should be addressed as follows:

Box (give number)  
SCIENCE  
1515 Massachusetts Ave., NW  
Washington, D.C. 20005

## POSITIONS WANTED

**Earth Scientist.** Ph.D. geology. Postdoctoral studies and teaching experience in oceanography. Considerable experience in geophysics. Some work in geochemistry, meteorology, and engineering. "Earth Scientist," c/o Undersea Press, Eau Gallie, Florida. X

**Electronic Technician** desires part-time work. Heavy experience in test instruments. Bioelectronic devices, nuclear counters, sonar, and so forth. Phototype design and construction. New York City metropolitan area only. Box 493, SCIENCE. X

**Entomologist.** Ph.D., 10 years of varied experience in project development desires research and/or academic position. Box 494, SCIENCE. X

**Nutritionist.** Ph.D. (1956). Seeks employment in biological research and/or teaching. Northeast United States. Saul I. Cohen, 15 Cottonwood Road, Newton, Mass. 02159. X

(a) **Organic Chemist.** Ph.D., group leader experience, R&D drug-cosmetic products; seeks administrative industrial appointment. (b) **Biology-Cytology** Ph.D., college teaching experience prefers research or teaching position. Write WOODWARD MEDICAL PERSONNEL BUREAU, 185 North Wabash, Chicago 60601. X

**Russian to English** technical translations. Literature searching service. Reasonable rates, prompt service. Box 495, SCIENCE. X

**Virologist.** Ph.D., with research, teaching, and industrial experience desires teaching position with research opportunity. Available after January 1965. Box 491, SCIENCE. X

**Virologist.** M.D., 40, male. Knows human and tumor viruses, seeking nonindustrial job. Box 496, SCIENCE.

## POSITIONS OPEN

### VIROLOGIST

Interesting opportunity for B.S./M.S. level researcher with several years of experience in virology particularly as related to the respiratory system. Should be familiar with tissue culture studies.

Please apply in writing indicating experience and salary requirements to Professional Employment Manager

**SCHERING CORP.**  
Bloomfield, New Jersey

## POSITIONS OPEN

### IMMUNOCHEMIST

The Ortho research foundation, recognized for advanced work in immunology, has an opportunity for a M.S. or experienced B.S. in immunology, serology or biochemistry to assist in fundamental research leading to new immunological diagnostic approaches.

Attractive suburban location in Central, New Jersey, full benefit program including educational assistance, moving expenses paid.

SEND RESUME TO:

**ORTHO  
PHARMACEUTICAL CORP.  
ROUTE 202 RARITAN, NEW JERSEY  
AN EQUAL OPPORTUNITY EMPLOYER**

### Ph.D. CLINICAL BIOCHEMIST

Four hundred fifty-bed acute general hospital medical center. Supervision of clinical chemistry department, research and development, and teaching medical technologists. Salary open. Will pay enough to attract a top notch clinical biochemist. Sharp Hospital, 7901 Frost Street, San Diego, California 92123.

### PHYSIOLOGIST— BIOCHEMIST

Unique opportunity for a Ph.D. with training in Biochemistry and Physiology and interests in drug research and development. To provide essential liaison between laboratory and clinical scientists, aid in evaluating scientific data and help plan R&D activities. Occasional travel and attendance at scientific meetings is an integral part of this position. Prior industrial experience is not required.

Please send resume to Cyrus M. Greenberg, Ph.D., Director of Scientific Employment, SMITH KLINE & FRENCH LABORATORIES, 1556 Spring Garden Street, Philadelphia, Pa. 19101. An equal opportunity employer.



### RESEARCH PHYSICAL --- BIOCHEMIST ---

Recent Ph.D., well trained in Physical Biochemistry. Should have intimate knowledge of instrumentation and be interested in purification and chemistry of viruses. Ability to develop sensitive and precise physical measurement for macromolecules desirable. Interested person write to Mr. Robert O'Connor, Research Personnel.

**MERCK & COMPANY, Inc.**  
WEST POINT, PA.  
An Equal Opportunity Employer

### UNIVERSITY OF NEWCASTLE UPON TYNE READERSHIP IN MICROBIAL GENETICS

APPLICATIONS are invited for the newly created Readership in Microbial Genetics. The successful candidate will be expected to take up his appointment as soon as possible after 1st November 1964. Salary in accordance with the scale for Readers with membership of F.S.S.U.

Further particulars may be obtained from the undersigned with whom applications (15 copies), together with the names of not more than three persons to whom reference may be made, must be lodged not later than 26th September 1964. (Applicants from outside the British Isles may submit one copy only.)

E. M. Bettenson Registrar  
University of Newcastle upon Tyne  
6 Kensington Terrace  
Newcastle upon Tyne 2

## POSITIONS OPEN

### PHARMACOLOGISTS

Applications of Senior Pharmacologists are invited for vacancies in the Pharmacology Department of expanding pharmaceutical company. The positions require a Ph.D. with 1-3 years postdoctoral experience, preferably in the field of analgesics and general neuropharmacology. Salary commensurate with experience. Outstanding employee benefits and working conditions.

Complete resume, which will be treated in confidence should be addressed to: PERSONNEL DIRECTOR

**GEIGY CHEMICAL CORP.**  
P. O. Box 430, Yonkers, N.Y.  
An Equal Opportunity Employer

### PROCESS DESIGN ENGINEER for Development Department

5-10 years experience in process industry. Background in fermentation, food or chemicals desirable.

Reply to Personnel Department

**FALSTAFF BREWING CORPORATION**  
5050 Oakland Ave., St. Louis, Mo. 63110

### SPACE FOR BIOLOGICAL RESEARCH

An institute managed exclusively by its active investigators is being organized in Los Angeles. Present programs supported by NIH are in iron metabolism and nutrition. We welcome established investigators with supported programs in related fields. For details contact A. Shoden, Executive Vice President, Institute for Biological Research, 9325 Venice Boulevard, Culver City, California.

THE UNIVERSITY OF MANITOBA. PROFESSOR OF ANATOMY AND HEAD OF THE DEPARTMENT. The position of Professor of Anatomy and Head of the Department will become vacant in September, 1965. The University of Manitoba is now prepared to accept applications for this position. Please address inquiries to the Dean, Faculty of Medicine, University of Manitoba, Cor. Bannatyne and Emily Streets, Winnipeg, Manitoba, Canada.

## The Market Place

**DISPLAY:** Insertions must be at least 1 inch in depth. Weekly invoices will be sent on a charge account basis—provided that satisfactory credit is established.

Single insertion	\$65 per inch
4 times in 1 year	60 per inch
13 times in 1 year	50 per inch
26 times in 1 year	50 per inch

**PROOFS:** If copy is to be set, and proofs submitted for approval, complete copy and cuts must be received 4 weeks in advance of issue date (Friday of each week); complete plates no later than 3 weeks in advance of issue date.

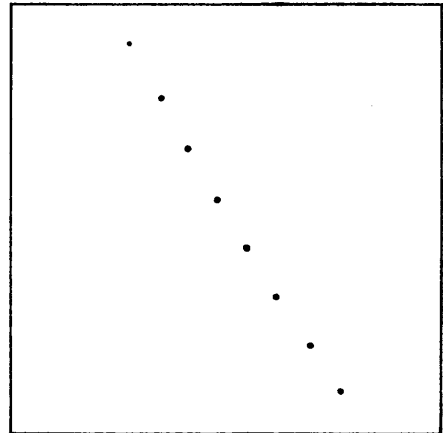
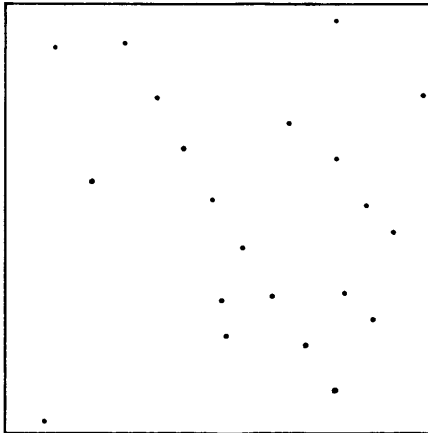
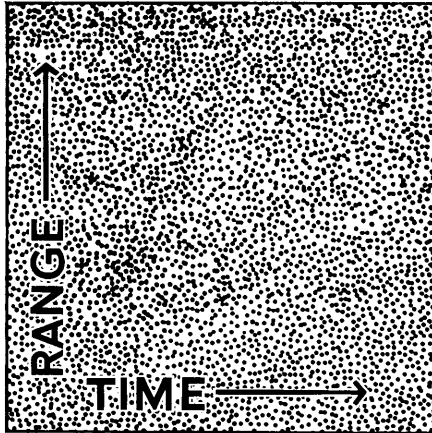
## SUPPLIES AND EQUIPMENT

**SPRAGUE-DAWLEY, INC.**  
Pioneers in the development of the  
STANDARD LABORATORY RAT.  
P.O. Box 4220  
Madison, Wisconsin  
CE 3-5318

A 30-second  
Report from

**BELL  
LABORATORIES**

Charts show 30-second real-time elimination by computers of noise from radar range data: left, raw data; middle, first stage of filtering; right, noise-free space target trajectory.



(**NOISE** & space target) (noise & **SPACE TARGET**) (**SPACE TARGET**)

Space objects can be tracked by sending radar pulses and observing reflections. But such reflections are accompanied by thousands of “noise” signals from the sky and from the radar receiver itself—especially when the threshold of detection is set low enough to pick up very small or very distant objects. For accurate tracking it is essential, of course, to distinguish reliably between the target signals and the noise.

A new data processing system developed at Bell Laboratories performs this separation of “real” signals from “noise” signals, and does it in two steps.

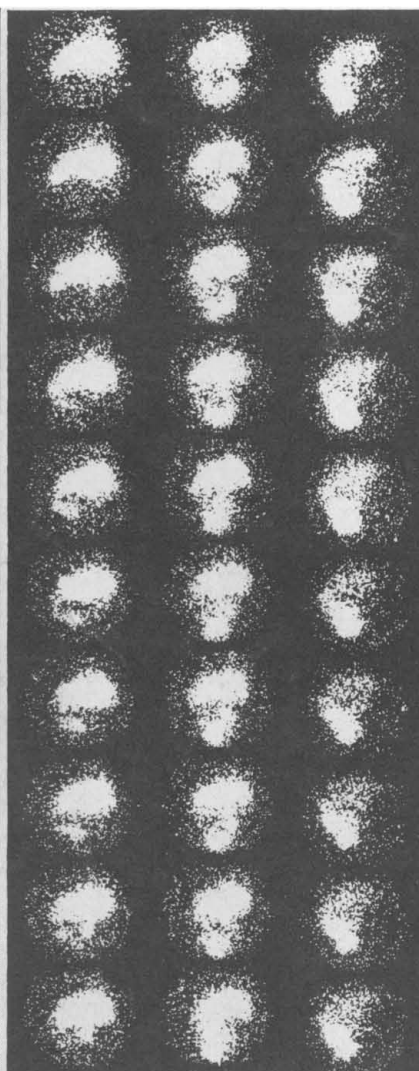
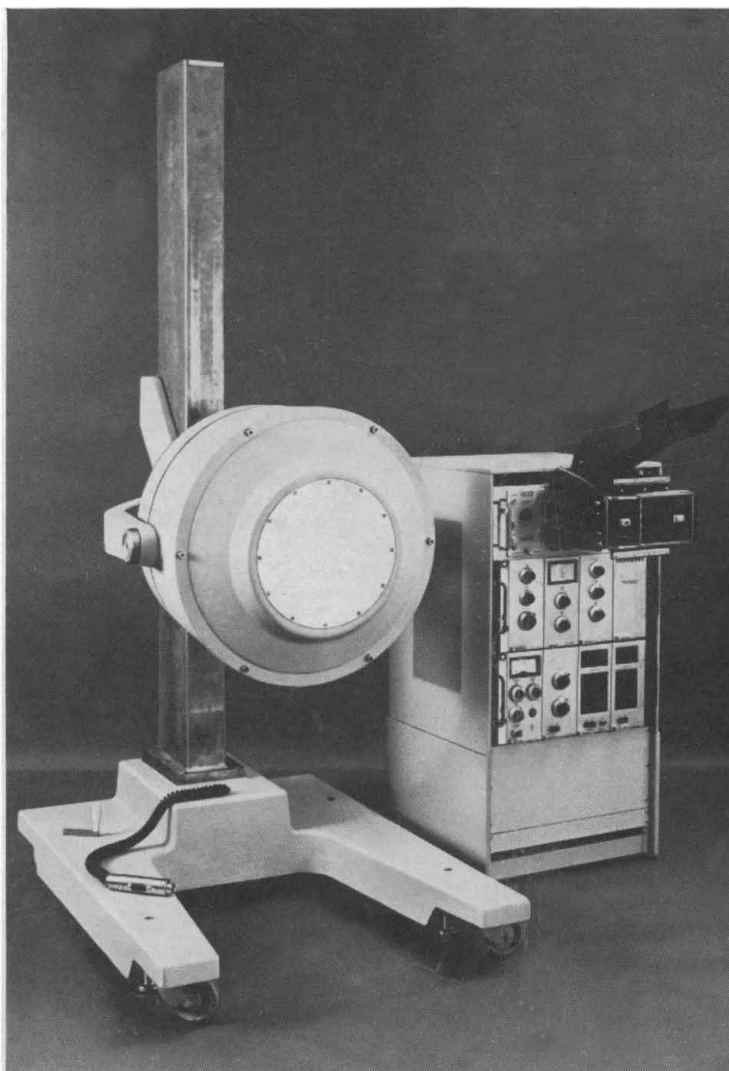
In the first step, a computer compares the received pulses following each transmitted pulse with those following the next succeeding transmitted pulse. Those received pulses of the first train are then retained which have corresponding pulses in the succeeding train; the others are rejected. Such correlated data result in the information shown in the middle chart.

In the second step, another computer compares the correlated data resulting from the transmitted pulses constituting one “look” at a given section of the sky with the correlated data on subsequent “looks” for the same section of the sky (although enlarged somewhat to allow for motion of the space object), again checking for correlation and when none is found rejecting the data. The third chart shows the resultant noise-free data of a space target moving through the sky.

The data processing system operates continuously and in “real time”—i.e., it processes the data immediately as they arrive from the radar. A human being performing the calculations carried out during the 30 seconds depicted above would require three weeks.

For this military project, engineers at Bell Laboratories, working closely with engineers of the Univac Division of Sperry Rand Corporation, designed and programmed the computers. Because of the demanding requirements of reliability and speed, they developed for it new high-performance semiconductor and magnetic memory components. The two groups combined talents with engineers of the Western Electric Co., the manufacturing unit of the Bell System, to build prototype computers. BELL TELEPHONE LABORATORIES. World center of communications research and development.





PHO/GAMMA IS A NUCLEAR-CHICAGO TRADEMARK

## PHO/GAMMA SCINTILLATION CAMERA RAPIDLY PICTURES ISOTOPE DISTRIBUTION IN THE BODY

The PHO/GAMMA Scintillation Camera rapidly and with great sensitivity visualizes human and animal organs containing isotope-

labelled compounds. Its usefulness in both research and clinical applications has been successfully demonstrated by the accurate diagnosis of thyroid, kidney, liver, and brain disorders.

Completed images of radioisotope distribution in organs or body areas can be produced and recorded at speeds of from one to fifteen minutes, depending upon the isotope administered and the region under examination. These speeds are in the range of three to ten times faster than those possible with photo-mechanical isotope scanners.

The instrument also produces

rapid-sequence, stop-motion images of dynamic processes. These stop-motion pictures are, in effect, "isotope movies" which accurately depict the flow of labelled compounds into and out of an organ. Such information provides the investigator and diagnostician with valuable insights into body processes.

Please consult your Nuclear-Chicago sales engineer or write for complete information. NUC-D-4-218



**NUCLEAR-CHICAGO**

A DIVISION OF NUCLEAR-CHICAGO CORPORATION

349 Howard, Des Plaines, Illinois 60018