staff of the G.E. Research Laboratory.

Although originally trained as a chemist, his initial investigations of the chemical problems of sodium lamps led him into electronics, where he concentrated most of his later efforts. During his long career he has worked on a variety of problems concerning vacuum tubes, including the introduction of getters and the use of alkali metal vapors. He was in charge of the groups responsible for construction of General Electric's 10-Mev, 50-Mev, and 100-Mev electron accelerators, in addition to the 70-Mev synchrotron.

Under his direction, the use of hard glass envelopes for x-ray tubes was introduced and came into general use. Methods of obtaining high-voltage x-rays by means of a multisection tube, as developed by W. D. Coolidge, were applied with Charlton's help. He became a consultant in the nucleonics and radiation section of the electron physics research department in 1954.

Recent Deaths

CHARLES C. GROVE, Baldwin, N.Y.; 80; retired professor of mathematics at City College of the City of New York; 12 Jan.

JOSEPH H. HEDGES, Chevy Chase, Md.; 73; retired mining engineer who served 29 years with the U.S. Bureau of Mines; 12 Jan.

HENRY P. MANNING, Providence, R. I.; 96; professor emeritus of mathematics at Brown University; oldest member of the American Mathematical Society; 11 Jan.

EDWARD J. REARDON, Washington, D.C.; 28; associate editor and head of the Washington bureau of *Chemical and Engineering News*; 10 Jan.

HARRY B. SHAW, Washington, D.C.; 86; former U.S. Department of Agriculture plant pathologist; expert photographer; 12 Jan.

DONALD W. TAYLOR, Worcester, Mass.; 55; associate professor of soil mechanics at Massachusetts Institute of Technology; 24 Dec.

RAY E. TORREY, Amherst, Mass.; 69; professor of botany at the University of Massachusetts; 16 Jan.

SAMUEL WEISHOFF, New York, N.Y.; 66; civil engineer and a partner in Weinberger, Weishoff, Leichtman, and Quinn, New York; 12 Jan.

Education

■ The Franklin Institute, Philadelphia, Pa., and the Remington Rand UNIVAC division of the Sperry Rand Corporation have announced the signing of a contract for the installation of a complete UNIVAC Computing Center and an integrated computation exhibit in the Franklin Institute. The center will be operated by institute personnel under the supervision of Donald Houghton, chief of the analysis section in the division of electrical engineering of the Franklin Institute Laboratories. Computations will be performed for both the laboratories and the public.

■ A plan to increase the supply of well-trained high-school teachers of science will be initiated next fall at a year-long workshop at Teachers College, Columbia University. It will be especially designed for professors at colleges that prepare science teachers. A criterion for selecting fellowship candidates will be their "ability and willingness to pass on their knowledge."

The workshop will start on 1 Oct. with a group of participants that will represent between 12 and 18 colleges. The program will be financed jointly by industry and by Teachers College. The cost for the first year is $79,000, of which $20,000 will be underwritten by the college; the remaining $59,000 will be contributed by corporations, industry, and foundations. About $35,000 already has been given or pledged by some 18 organizations.

It is hoped that four additional workshops can be carried out at Columbia, for it is expected that it will take at least 5 years for the program to make itself felt. In that time workshop members will have introduced results of their work in their own institutions and will have begun to train science teachers along the lines developed at the workshop.

■ Effects of radiation on living creatures will be studied in a special course this spring at Duke University. The new one-semester course, which will begin on 1 Feb., will be conducted by the university's zoology department in cooperation with the Oak Ridge National Laboratory.

John S. Kirby-Smith, biophysicist in the biology division at Oak Ridge, will serve as visiting professor at Duke to organize and teach the course. Other Oak Ridge scientists who will be guest lecturers are John Totter, biochemist; Richard Kimball, protozoan geneticist; and Arthur Upton, pathologist.

■ The University of Wisconsin has received a grant of $249,700 from the National Science Foundation to inaugurate an experimental program designed to train high-school teachers to teach science and mathematics more effectively. The program will begin next fall with 50 high-school science and mathematics teachers, chiefly from Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, and Wisconsin. Harvey Sorum of the University of Wisconsin's chemistry faculty will direct the program.

The program will first be tried at the University of Wisconsin and at Oklahoma A. and M. College. If successful, it will be expanded to include eight institutions in the academic year 1957–58, with the idea that advanced teacher training in science would become a continuing program in which science teachers in all parts of the United States could participate.

Each teacher will receive $3000 with an additional allowance of $300 for each dependent, plus tuition fees and travel allowances. To be eligible to participate in the program, a teacher must have a bachelor's degree; he must have taught for three or more years; he must be teaching science or mathematics; he must show scholastic and teaching ability; and he must be under 46 years of age. The deadline for submission of applications *is 1 Mar.*

Grants, Fellowships, and Awards

■ Nominations for the $1000 Eli Lilly and Company research award for 1956 are invited. The award is made annually to a young microbiologist who has performed outstanding research in bacteriology or its related fields. To be eligible the nominee must be less than 35 years of age on 30 Apr. 1956. Nominations for the award should be addressed to Dr. S. E. Luria, Chairman, Nominating Committee, and sent to John Hays Bailey, Secretary-Treasurer, Society of American Bacteriologists, Sterling-Winthrop Research Institute, Rensselaer, N.Y., to reach that office *not later than 10 Feb.* Four copies of all material should be submitted and must include the following: month, day, and year of birth; curriculum; list of publications; specific reference to the research upon which the nomination is based; and supporting letters, if possible. No reprints or manuscripts should be submitted.

■ The Williams-Waterman Fund for the Combat of Dietary Diseases has announced that during the fiscal year ended 31 Oct. 1955 grants-in-aid of research in the amount of $131,573 were made. The objective of the Williams-Waterman Fund is the advancement of scientific knowledge concerning all aspects of human nutrition and metabolism, with preference being given to proposals that may be expected to make an early contribution to the nutritional well-being of humanity.

Since the principal opportunities for direct attack on nutritional deficiencies lie abroad, the fund has continued to support nutrition research in several foreign countries. At the same time,

long-range, fundamental investigations in nutrition and metabolism in the United States have received aid. Requests for information or for grant application forms may be addressed to the Williams-Waterman Fund, Research Corporation, 405 Lexington Ave., New York 17.

■ A number of graduate and advanced research fellowships are offered by the Massachusetts Institute of Technology for study and research in electronics. These are known as industrial fellowships in electronics and are sponsored jointly by a group of industrial organizations concerned with the advancement of electronics and its applications.

The stipend of a graduate student fellowship will be between $1500 and $2400 for the academic year, according to experience and qualifications. In addition tuition fees will be paid for the fellow. Advanced research fellowships will be awarded to candidates possessing the Ph.D. degree or its equivalent who, without enrolling as graduate students, wish to pursue advanced research. The stipend will range from $3000 upward, according to the qualifications of the recipient.

An applicant for an industrial fellowship in electronics should communicate with the Director, Research Laboratory of Electronics. Application should be made at least 4 months prior to the intended date of entrance.

■ The National Society for Crippled Children and Adults has announced that approximately 20 scholarships and fellowships for two separate training programs will be awarded this spring and summer to professional persons who work with crippled children and adults. In one training program, cosponsored by Alpha Gamma Delta and the society, fellowships will be awarded for specialization in counseling the cerebral palsied and other severely handicapped persons.

Training will be held at the Institute of Physical Medicine and Rehabilitation, New York University–Bellevue Medical Center, 18 June–13 July. Fellowships will be awarded to qualified counselors, guidance teachers, employment interviewers, placement personnel, and other professional persons working with the physically handicapped. Individual grants will total approximately $300 for the course, with $160 of this amount used for tuition and laboratory fees. The deadline for receipt of applications for these fellowships is *15 Mar.*

The second training program is jointly sponsored by Alpha Chi Omega and the National Society. Scholarships are provided to assist professionally trained persons in intensive study that is related to work with children and adults having cerebral palsy. Individual grants for scholarships vary in amounts up to $750, depending upon the length and scope of the course chosen. Training is given at various institutions under the guidance of a member of the American Academy of Cerebral Palsy. The deadline for receipt of applications under this program is *1 Apr.*

Application forms and other information on both the scholarship and fellowship programs may be secured from the Personnel and Training Service, National Society for Crippled Children and Adults, 11 S. LaSalle St., Chicago 3, Ill.

In the Laboratories

■ The Atomic Energy Commission has announced that a system of competitive bidding will be instituted for leasing uranium deposits developed by the AEC on withdrawn public lands and certain other areas under AEC control. Lands affected include those originally purchased by the Manhattan Engineer District that were subsequently transferred to the AEC and public lands that were withdrawn from mineral entry at the request of the AEC for exploration purposes.

Leases will be awarded to the acceptable bidder offering the highest cash bonus by sealed bid. The royalty rate, work requirements, and other conditions will be stated in the invitation to bid. These conditions will be determined by the AEC and will be based on the estimated size and grade of the deposit and the cost of mining facilities and production.

However, leases will be negotiated rather than offered for competitive bidding when it is determined that special circumstances make negotiation preferable in the best interest of the Government. For example, negotiation might be employed to lease an AEC-controlled deposit that could be economically mined from the underground workings of an adjoining privately owned mine, but could not be economically mined from a separate shaft or entry. Also, extensions of existing leases may be handled by negotiation rather than competitive bidding, particularly where the lessee has developed ore reserves at his own expense.

■ Truesdail Laboratories, Inc., of Los Angeles, research and testing firm, has established an operating division laboratory in Honolulu, and arrangements have been made to lease space in a new building soon to be erected by the Hawaii Chemical Company, Ltd. The new Honolulu division will render applied laboratory services, with certain highly technical problems to be handled by the staff and specialized equipment in the Los Angeles headquarters. The firm's present Research Advisory Board will be expanded to include specialists from the University of Hawaii.

Miscellaneous

■ One of the most outstanding events in the history of the American Physical Society was the session honoring Enrico Fermi that was held at the 1955 Washington meeting of the society. This consisted of addresses by H. L. Anderson, E. Konopinski, F. Seitz, E. Segrè, and W. H. Zinn, and of the words by which H. A. Bethe as chairman (and organizer of the session) introduced the session as a whole and the speakers severally.

These addresses and Bethe's remarks were recorded on tape by R. E. Wolford and J. B. Wise, whose avocation is the making of records, and who made these gratuitously as a service to the society. Through their courtesy also, reproductions of the records on tape or disk will be made available in any quantity and may be purchased at no more than cost.

The six records, either in the form of tape (7-inch reel, ¼-inch tape, 1200 or 1800 feet in length) or 12-inch microgroove LP disk, will be sold separately or all together. The price for the whole set, tape or disk, will be $30. The price for any disk is $5; the price for the tapes of Anderson, Bethe, Konopinski, and Seitz is $5 for each; the price for the (longer) tapes of Segrè and Zinn is $7.50 each. These figures include postage for orders from the United States, Canada, and Mexico.

Checks or money orders should be made payable to the American Physical Society and mailed to Dr. R. D. Huntoon, National Bureau of Standards, Washington 25, D.C. Anyone who places an order from abroad should ascertain the postage required, deduct 50 cents, and remit the difference with his order. The shipping weight is 1 pound for each disk or tape.

■ Among the articles in the February issue of *The Scientific Monthly* is "Challenge of arid lands" by B. T. Dickson. This article is based on an address given 28 April 1955 at the International Arid Lands meetings, sponsored by the AAAS and its Southwestern and Rocky Mountain Division, at the University of New Mexico, Albuquerque. The other articles include "Early history of radio astronomy," George C. Southward; "Problems in zoological polymorphism," John M. Burns; "Mathematics and natural philosophy," Niels Bohr; and "Techniques used in studies with high-intensity gamma radiation," L. E. Brownell and J. V. Nehemias.

Seventeen books are reviewed.