quadrupolar periodic electric and magnetic fields. They find that "periodic focusing may be useful for one or more of at least three reasons: (1) the reduction of magnet weight effected by periodic magnetic focusing when permanent magnets are employed, (2) the possibility of making the focusing electrodes an integral part of the rf structure in certain traveling wave tubes, and (3) the production of an electron beam with a periodically varying boundary, charge density, or velocity." To aid in the design of actual instruments making use of periodic fields appropriate equations and graphs are given.

Negentropy is a recent concept in information theory which corresponds to "information" in a physical system. When information is obtained from a system, the negentropy of the system decreases by an amount equal to or greater than the information, leading to the principle that "The sum of negentropy plus information must always decrease". In a paper appearing in the May *Journal of Applied Physics* **L.** Brillouin of IBM discusses this principle in relation to telecommunications (i.e. "live" information) and writing and reading (i.e. "dead" information). Live information carries the energy required for its detection along with it, and much of it is bound to be lost by dissipation, sound absorption, etc. Dead information presents more of a problem; a book may easily be read by 10^5 people, increasing the information by that factor and apparently contradicting the above principle since, after all, the work involved is the same to the author and publisher whether the book is read or not. Brillouin surmounts the problem by stating that "an additional source of energy is absolutely necessary for the reading, and this source of energy provides the negentropy which is changed into new information".

The study of color centers in alkali halide crystals has proved to be an especially fertile way of approaching the problem of crystalline imperfections. The structure of such crystals is quite simple and perfect ones can be obtained readily; further, "they appear to exhibit in striking form a large number of physical and chemical properties of the type that are strongly influenced by the principal crystalline imperfections, namely, excitons, electrons and holes, vacant lattice sites, impurity atoms, and dislocations. To date no other type of crystal has permitted so clear a vista to the imperfection-determined properties." This quotation is from "Color Centers in Alkali Halide Crystals. II", an 88-page review article by Frederick Seitz appearing in the January *Reviews of Modern Physics,* in which a comprehensive survey of recent work in this field is given. An earlier article with the same title, published eight years ago, is now obsolete, and the present paper is designed to rectify the situation.

For centuries people have been trying all sorts of schemes for utilizing the sun's energy for their own particular purposes. Aside from frying eggs on sidewalks to demonstrate how hot it has been, the most popular approaches have been by means of photoelectric devices and by solar furnaces. The latter usually consist of parabolic mirrors that concentrate the sun's light on a very small area, and produce the highest temperatures yet obtained in a convenient manner. Sometimes, however, a uniform intensity of radiation is required over a larger area; this was the case at MIT recently. In the May *Review of Scientific Instruments* Robert Gardon describes a solar furnace built at MIT using 400 small plane mirrors that produced 5 cal/cm^2 sec over a 5 cm square area, a radiant intensity 200 times greater than that of direct sunlight. The use of plane mirrors made possible the larger uniformly illuminated area, and the apparatus was simple and inexpensive to construct.

The new 60-inch cyclotron at the University of Washington is described in the May *Review of Scientific Instruments,* and, besides a discussion of the characteristics of the machine, "an account is given of the major troubles encountered and the steps taken to achieve satisfactory operation". Three years were required between the start of construction and the attainment of an internal beam, and the total cost, including buildings and salaries, was about $900 000. The present external beam of the machine is 125–200 μa of either deuterons or molecular hydrogen ions at 21 Mev.

Publications

Former NBS Director Lyman J. Briggs, who retired in 1945 after having spent almost half a century in public service, celebrated his eightieth birthday on May 7th. In honor of the occasion, *The Scientific Monthly* has devoted most of its May issue to a group of articles dealing with Dr. Briggs' career and with certain major scientific developments to which he has contributed. Articles included are by Wallace R. Brode, Vannevar Bush, E. C. Crittenden, N. Ernest Dorsey, Hugh L. Dryden, Gilbert Grosvenor, Paul R. Heyl, and L. A. Richards. Dr. Brode's introductory tribute to Dr. Briggs, together with the remarks by Dr. Bush, constitutes a concise and illuminating review of the early history of the atomic energy program, beginning with the formation in 1939 of the Advisory Committee on Uranium under the leadership of Dr. Briggs, and culminating three years later in the establishment of the Manhattan District project. Dr. Briggs was presented with a recording microbarograph at a meeting of the staff of the Bureau of Standards, at which he discussed his early work with Rowland at Johns Hopkins University and the Department of Agriculture, as well as his work at NBS.

A new series of *Zeitschrift für Physikalische Chemie* (originally established in 1887) is now being published in Germany by Akademische Verlagsgesellschaft, Frankfurt, by arrangement with the original owners and in cooperation with the former editors. It is pointed out that the contents of the Frankfurt edition, of which the first issue was published in May, are "not identical with those of a periodical released under the same title in Leipzig, Soviet Zone of Germany". Two vol-

umes of the new series (each priced at $8.35) will be published during 1954. Inquiries should be addressed to Akademische Verlagsgesellschaft, m.b.H., Holbeinstrasse 25–27, Frankfurt am Main, Germany.

A recently announced quarterly publication, the *Journal of the Association for Computing Machinery*, will contain papers on subjects such as methods of numerical computation and their underlying mathematical theory, techniques of programming and coding, and the design, development, operation, and applications of digital and analogue computing systems. The first issue is dated January 1954. The Association is located at 2 East 63rd Street, New York 21, N. Y.

Nuclear data are now available on 3 x 5 inch index cards through the National Research Council, with monthly sets of about 100 being distributed to subscribers. The cards are prepared as a step in producing the quarterly lists of data that are published in *Nuclear Science Abstracts*, and are duplicated for individual distribution as well. The data are compiled by the Nuclear Data Group under the direction of Dr. Katherine Way with the support of the AEC and the National Bureau of Standards. Subscriptions to the card service are available for $20 per year from the Publications Office, National Research Council, Washington 25, D. C.

A list of translations in the Special Libraries Association Translations Pool is now available for distribution. Requests for copies, accompanied by 30¢ to cover the cost of postage, should be addressed to: SLA Translations Pool, John Crerar Library, 86 East Randolph Street, Chicago 1, Illinois. The 73-page list comprises 1100 translations which were in the Pool as of October 1st, 1953. An addendum to cover several hundred translations contributed in the interim will be issued shortly.

McGraw-Hill Book Company has announced the appointment of Leonard I. Schiff, chairman of Stanford University's department of physics, as consulting editor of the International Series in Pure and Applied Physics. Dr. Schiff succeeds G. P. Harnwell, who resigned the editorship upon his acceptance of the presidency of the University of Pennsylvania. The series of textbooks of modern physics was established by McGraw-Hill in 1930 under the consulting editorship of the late F. K. Richtmyer of Cornell. Dr. Richtmyer's successor, and Dr. Harnwell's predecessor, was L. A. DuBridge, who is now president of the California Institute of Technology.

Elected

The Federation of American Scientists has announced the election of new officers for 1954–55. Chairman for the coming year is M. Stanley Livingston, professor of physics at MIT, who succeeds David L. Hill; Ernest C. Pollard, Yale University physics professor and chairman of the Scientists' Committee on Loyalty and Security, has been elected vice-chairman. Other members of the Executive Committee are: Lewi Tonks, Knolls Atomic Laboratory, secretary; Arthur S. Wightman, Princeton University, treasurer; William A. Higinbotham, Brookhaven National Laboratory; David L. Hill, Los Alamos Scientific Laboratory; and John S. Toll, University of Maryland. The Executive Committee is responsible to the Council, which consists of delegates representing each FAS chapter and the membership-at-large, for directing action on issues as they arise.

Grants and Fellowships

A total of 243 fellowships have been awarded for 1954 by the John Simon Guggenheim Memorial Foundation, with accompanying grants of more than $1 million. 13 of these are listed under categories of physics. In comparison, last year there were 191 grants worth $780 000, of which 12 were awarded in physics. The following physicists received fellowships: Henry G. Booker, Cornell University, for a study of the physics of the outer atmosphere; Herman Feshbach, Massachusetts Institute of Technology, meson-nucleon interactions; Henry M. Foley, Columbia University, nuclear structure problems; William A. Fowler, California Institute of Technology, nature of nuclear forces; David H. Frisch, MIT, theoretical models of nuclear fission; George F. Koster, Lincoln Laboratory, MIT, electronic structure of diamond; Joanne S. Malkus, Woods Hole Oceanographic Institution, atmospheric convection and cloud physics; John H. Manley, University of Washington, collective and single-particle models of the nucleus; Robert E. Marshak, University of Rochester, meson physics; Norman F. Ramsey, Harvard University, consultation and experimentation with European physicists; Stanley G. Thompson, Radiation Laboratory, University of California, nuclear properties of the isotopes of the transuranium elements; Arthur H. Waynick, Pennsylvania State University, the physics and chemistry of the lower ionosphere; John C. Wheatley, University of Illinois, nuclear polarization.

Also of interest are the following awards: Carl B. Boyer, Brooklyn College, history of the theory of the rainbow; Paul J. Flory, Cornell University, high polymer theory in relation to biological systems; Charles C. Gillispie, Princeton University, history of French science; Herbert S. Gutowsky, University of Illinois, radio frequency and microwave spectra in relation to the structure of matter; Lester Guttman, Institute for Study of Metals, University of Chicago, structure of liquid metal solutions; Donald F. Hornig, Brown University, quantum theoretical studies of molecular structure; Thomas S. Kuhn, Harvard, studies of the sources and preconditions of scientific concepts; William N. Lipscomb, Jr., University of Minnesota, valence theory with applications to electron deficient compounds; Chester T. O'Konski, UC, Berkeley, aqueous solutions of macromolecules; George C. Pimentel, UC, Berkeley, infrared spectroscopy; Max T. Rogers, Michigan State College, molecular structure; Robert L. Scott, UCLA, studies in the nature of liquids and solutions, including those of high molecular weight;