World War II, provide approximately forty thousand square feet of laboratory and office space and house the scientific equipment and personnel of NRL's nucleonics division, one of the Laboratory's twelve scientific divisions. Established in 1947, the nucleonics division is concerned with naval applications of nuclear science. Scientists have already moved into at least one of the new buildings, a two-story square structure of steel-reinforced concrete. This building will contain a five-Mev Van de Graaff generator, besides providing machine shop facilities and office space for personnel. The second and larger of the two buildings will contain a two-Mev Van de Graaff generator and also a twenty-Mev betatron. It is expected that the various accelerators will be in operation early in 1953.

National Science Foundation

Grants in Support of Basic Research

Fifty-two grants and two contracts, totaling more than three-quarters of a million dollars, have been approved by the National Science Foundation under its programs for the support of basic research in the physical and the biological sciences. The list of awards, made public on October 21st, includes thirteen grants in physics with an outlay of $184,900, which amounts to about one-fourth of the total. In addition, a number of awards itemized under other categories are of interest to physicists, some of them primarily so. Approximately thirty percent of the total funds have been awarded for research in the biological sciences. Of the remaining amount, fourteen percent was for work in chemistry, five percent in engineering, and the rest in astronomy, the earth sciences, mathematics, and miscellaneous projects in science and scientific education.

Seven physics grants, each with a duration of one year, were awarded to the following institutions (the amounts, the subjects of the research, and the names of the principal scientists are given parenthetically): Carnegie Institute of Technology ($10,000, electronic states in solids and in chemical compounds with the method of observations on positron annihilation, S. DeBenedetti and R. Siegel); Columbia University ($10,100, theoretical analysis of hyperfine structure problems, H. M. Foley); Lehigh University ($4300, theoretical study concerning the nature and interaction of fundamental particles, P. Havas); Louisiana State University ($11,800, measurement of the Hall effect and magneto-resistance of graphite and bismuth, J. M. Reynolds); University of Pittsburgh ($5900, theoretical study of positron annihilation in matter, P. M. Stehle); St. Louis University ($2900, structure of evaporated metal films as a function of film thickness, H. U. Rhoads); and Western Reserve University ($9500, double beta decay, R. G. Winter).

Two-year grants were awarded to the University of Illinois ($9200, low-temperature electronic phenomena in solids, R. Maurer); Indiana University ($30,000, theory and interpretation of the interaction of elementary particles, E. J. Konopinski); Massachusetts Institute of Technology ($12,400, elastic spectrum of solids by the measurement of the temperature diffuse scattering of x-rays, B. E. Warren); University of Minnesota ($45,000, atomic mass determinations with double-focusing mass spectrometer, A. O. C. Nier); and Ohio State University ($14,900, physics of natural and artificial precipitation, A. N. Dingle).

A single grant of three years' duration was awarded to the University of Oregon ($18,900, shift and broadening of special lines under high pressure of foreign gases, S. Y. Ch'en).

In addition to the awards listed under the heading of "Physics", NSF support amounting to $3600 has been provided to the American Association of Physics Teachers for the compilation and publication of a twenty-year cumulative index for the *American Journal of Physics*, under the direction of its editor, T. H. Osgood. The Foundation is also providing funds for the expenses of two conferences of interest to physicists, of which one is the third annual conference on high-energy physics being held this month at the University of Rochester, and the other is a conference on the abundance of the elements, held early last month at the University of Chicago's Yerkes Observatory. $2000 was provided for the former, with R. E. Marshak listed as principal scientist; H. C. Urey is named in connection with the Yerkes conference, for which $4000 is awarded by the Foundation.

As previously mentioned (*Physics Today*, September 1952, p. 30), NSF is joining with the Office of Naval Research and the Rockefeller Foundation in a three-year program to provide financial support for the White Mountain high-altitude research station in California, and the sum of $32,800 for this purpose is listed as one of the current awards.

This is the first group of grants and contracts to be announced from NSF's 1953 fiscal year budget for the support of basic research and other matters relating to the mission of the Foundation. Additional proposals are being evaluated by the NSF staff with the help of advisory panels of outstanding American scientists.

Miscellany

Three new members appointed by President Truman to the General Advisory Committee of the Atomic Energy Commission are James B. Fisk, director of physical research at the Bell Telephone Laboratories and former head of the AEC's division of research, John C. Warner, president of the Carnegie Institute of Technology, and Eugene P. Wigner, professor of physics at Princeton University. They succeed James B. Conant, president of Harvard University, Lee J. DuBridge, president of the California Institute of Technology, and J. Robert Oppenheimer, director of the Institute for Advanced Studies.

Memorializing the nineteenth century Michelson-Morley interferometer experiment, which demonstrated that the observed velocity of light is constant regardless of the earth's motion or position relative to the

sun, Case Institute of Technology and Western Reserve University of Cleveland will dedicate a plaque near the boundary line of their adjoining campuses on December 19th, the 100th anniversary of Dr. Michelson's birth. Results of the experiment puzzled physicists for some time before an explanation was offered by the so-called "Lorentz-Fitzgerald contraction", which formed a part of the foundation for relativity theory. The ceremony will be held during a special meeting of the Cleveland Physics Society.

France's second nuclear reactor is reported to be in operation at the French Atomic Energy Commission establishment near the village of Saclay outside of Paris. Under construction for about two years, the heavy water pile was designed to provide a neutron flux intermediate between the original Argonne and Chalk River reactors and is of considerably higher power than "Zoe", the other experimental pile at the Commission's Chatillon Laboratory.

Soviet scientific and engineering manpower is increasing rapidly, according to a recent report in the AAAS journal, *Science*, by D. Shimkin of the Russian Research Center at Harvard. Based on an analysis of official Soviet publications, the report states that "possibilities of profound new developments in science, technology, and other fields" have been opened up as a result of a significant increase in enrollments during the past decade in technical and other specialized secondary schools and in institutions of higher learning. About 475,000 natural scientists and engineers are now reported to be professionally employed in manufacturing, construction, transportation, and communication.

The West German Republic will be permitted to mine uranium and to build its own nuclear reactor, according to the *New York Times* in a report of a statement made by Werner Heisenberg on October 1st. The dispatch indicated that an agreement between the three Western High Commissioners and Chancellor Adenauer is expected to lead to a two-year agreement fixing the output of the pile and the amount of uranium mined and allowing the Bonn Government to carry on a non-military nuclear research program.

Color science is the theme of a new German technical journal, *Die Farbe*, edited by M. Richter, Berlin, and published quarterly by Verlag für angewandte Wissenschaften, GmbH., Wiesbaden. Besides original papers, the journal will carry review articles, book reviews, and news items. Short abstracts in both English and German will accompany the articles.

Education

The current shortage of scientists and engineers was clearly forecast several years ago by conditions in high schools, according to James W. Neckers, chairman of the chemistry department at Southern Illinois University, who participated in a panel discussion at a meeting of the Scientific Apparatus Makers Association at Hot Springs, Virginia, early in November. Most science students, he pointed out, make their decision to study science before entering college. Among other conclusions, the panel stressed the need for more effective guidance procedures at pre-college levels of education and for the development of some means of collecting and channeling necessary information to guidance personnel.

Research Corporation, the nonprofit foundation established by Frederick Gardner Cottrell in 1912, has recently announced grants in aid of research totaling over $120,000. Of this amount, more than seventy percent is distributed under the Cottrell Grants program to aid science and teaching in the smaller colleges, and the remainder to grantee institutions in the form of General Grants to support research of a pioneering nature, primarily in the physical sciences. The current grants bring the total amount distributed by Research Corporation since it was founded to approximately seven million dollars.

Radiological health protection will be taught in a tuition-free series of three two-week courses in Cincinnati commencing January 19th, with the purpose of assisting health department employees and key personnel in other governmental or private organizations to achieve a working knowledge of the hazards and problems relating to use of x-rays, radioelements, neutron fluxes, and particle accelerators. Further information can be obtained by writing to: Chief, Radiological Health Training Section, Environmental Health Center, 1014 Broadway, Cincinnati 2, Ohio.

San Francisco's new Morrison Planetarium, formally opened early in November, is the seventh major planetarium in the United States and the first to be equipped with a projector made in this country. All other projectors had been made at the German Zeiss plant at Jena. Wagner Schlesinger, director of Chicago's Adler Planetarium, is reported to have termed the new projector "the best in the world". Constructed by G. Dallas Hanna, Albert S. Getten, and Alvin C. Gundred, the instrument is said to be able to simulate the motions of the planets with an accuracy of about one part in one million.

Industry

Transistors developed by the Bell Telephone Laboratories are undergoing their first trial application in commercial nation-wide long distance telephone dialing at Englewood, New Jersey, where they have replaced vacuum tubes in senders. The vacuum tube oscillators and associated equipment ordinarily used to supply power for multifrequency pulsing in the dialing system are electronically complicated and take up a large amount of space. The new unit employing transistors occupies little more space than a portable radio and has greatly simplified the problem of correcting oscillator failures quickly and inexpensively.

Beckman Instruments, Inc., South Pasadena, California, manufacturers of scientific and industrial instruments and precision components, is constructing a new plant in Mountainside, N. J. to be used as an eastern facility for the Beckman subsidiary, Helipot Corporation, manufacturer of helical potentiometers.