and conducted on a larger scale by other federal agencies.

The Civil War saw the creation of a quasi-governmental organization, the National Academy of Sciences, as a self-perpetuating body of distinguished scientists which was directed by law to study and report upon "any subject of science or art" when called upon by a government department. However, while some important new devices came into use during this conflict, relatively few civilian scientists undertook work on military equipment and weapons.

Post-Civil War Activity

In the half century following the Civil War, there was a steady growth in the Government's scientific effort, characterized by the expansion of data-gathering services undertaken in the public interest, such as the work of the Coast & Geodetic Survey, the Weather Bureau, and the Census Bureau. In addition a number of new scientific activities appeared which were designed to provide agencies with the data and materials needed in carrying out their responsibilities, such as the experimental work of the medical and signal activities of the Army and the analysis and testing work of the bureau of chemistry in the Department of Agriculture and at the National Bureau of Standards. The National Academy of Sciences was frequently called on to advise on the scientific problems faced by various departments.

Immediately before World War I, the establishment of the National Advisory Committee for Aeronautics (NACA) marked the beginning of a research program that was destined to pave the way for the development of new commercial and military aircraft in the years to come.

World Wars I and II

During World War I a new quasi-governmental organization, the National Research Council, was established by the National Academy of Sciences with the cooperation of national scientific and technical societies to make the nation's scientific resources more fully available to the Government.

In the period between the first and second World Wars, the Government's scientific activities expanded at an accelerated pace. Various Institutes of Health were created as part of the Public Health Service, and the federal medical research program grew rapidly. The War and Navy departments built a number of important new research installations. The social sciences began to play a role in the departments of Commerce, Labor, and Agriculture, and statistical and data collection activities and services were considerably expanded.

In World War II, several new organizational arrangements carried out the great bulk of all military research and development. These were principally the Office of Scientific Research and Development (OSRD) and its two major constituents, the National Defense Research Committee (NRDC) and the Committee on Medical Research; and the Manhattan Engineering District of the War Department's Corps of Engineers, which took over the research and development program on nuclear fission begun by NDRC. Each of these entities relied heavily upon contractual arrangements, primarily with university-based organizations, for the actual conduct of the wartime research and development projects which applied the scientific discoveries of recent years to military use. Military research and development in aeronautics was handled by an expanded National Advisory Committee for Aeronautics. This agency, whose former chairman, Vannevar Bush, became head of OSRD, provided a model for many aspects of the organization and operation of OSRD.

1945 to 1947

The termination of World War II was a critical occasion for the Federal Government's scientific activities. Popular understanding and acceptance of science stood at an all-time high, and scientists, as a result of their wartime accomplishments, enjoyed an unprecedented prestige. However, two important problems had to be faced.

Many of the civilian scientists in the Office of Scientific Research and Development were anxious to return to their peacetime pursuits, and the office began disbanding in 1945. The national security, nevertheless, required the continuance of some of the OSRD's major projects into the postwar period. Consequently, the military departments faced the problem of preserving the facilities, and at least a core of the personnel, engaged in these projects.

The status of basic research in the nation posed the other problem. It was widely recognized that wartime weapon developments had drawn heavily on the basic knowledge produced by the research of earlier years. European science, which had contributed much of our basic knowledge in the past, had suffered severely during the war. The Government's obligation to expand greatly its support of basic research was stressed in statements by key officials of the executive branch, and by scientists, businessmen, and others in congressional hearings.

The first problem was met in the postwar period by the transfer of a number of OSRD projects to the military department. For instance, the Air Force integrated personnel and equipment of the radiation laboratory at the Massachusetts Institute of Technology into its Cambridge Research Center.

Achievement of an adequate level of support for basic research proved to be a more difficult problem. In 1945 Vannevar Bush, the wartime director of the OSRD, submitted a report at the request of President Franklin D. Roosevelt on the steps needed to continue the nation's scientific advance. In his widely publicized report, *Science—The Endless Frontier,* Bush proposed the establishment of a National Research Foundation to support research and education in the sciences and dissemination of scientific information.

The principal federal support for basic research in the years immediately following the war came from the Navy Department, which set up the Office of Research and Inventions in 1945. In 1946, by act of Congress, this became the Office of Naval Research which supports basic research in the many scientific fields of interest to the Navy.

Another major source of support for such research was the National Institutes of Health. From the Atomic Energy Commission, an agency also established in 1946, came other funds for the support of basic research. In 1947, President Truman, recognizing the need for a full examination of the nation's scientific research effort, established an *ad hoc* body, the President's Scientific Research Board, under the chairmanship of his adviser, John R. Steelman.

Archeology in the Upper Nile

When the Aswan dam in Egypt is completed—and the Soviet Union has promised the United Arab Republic that it will help finance the project—a storage basin more than 300 miles long will engulf the temples and burial grounds of the early rulers of Nubia dating back to 4000 years before Christ. Six thousand years of recorded history of the life of man along the upper Nile in Egypt and the Sudan will be deep under water in 4 or 5 years.

To save as much as possible of the record, the Department of Antiquities of the Egyptian Government this spring asked all governments and acheological groups that had shown an interest in Egypt to concentrate their efforts for the next few years in the upper Nile Valley. The response has not been very encouraging, for there have been only five affirmative replies. These came from the United States, Italy, West Germany, Poland, and the Soviet Union. The American response came from Brown University. Brown is sending an expedition, under Ricardo Caminos, to take

over a photographing program that was begun by a British group, but which had to be abandoned after the attack on Suez by Britain, France, and Israel in 1956.

Egypt herself is sending out two expeditions to the area this year, and the United Nations Educational, Scientific and Cultural Organization has had a photographic program in progress for several years.

Some of the smaller temples, such as those to Isis at Philae, just above Aswan, could be taken down and reassembled elsewhere. An Egyptian survey team recommended that this be done 2 years ago. Two of the most beautiful of the temples along the Nile will be lost. They are the two at Abu Simbel, above the second cataract, that were carved out of the mountainside during the reign of Rameses II (1300–1234 B.C.), greatest of the early Pharaohs. It is these that the UNESCO team, under the direction of Mme. Desroches-Noblecourt of France, is attempting to photograph by a three-dimensional process. Mme. Desroches-Noblecourt is director of the Egyptian section of the Louvre in Paris. The photogrammetric process records accurately to fractions of a centimeter.

The losses on the Sudanese side of the twenty-second parallel, the dividing line between the two countries, will be even greater than those in Egypt. Much less work has been done there.

Implementation of the National Education Act

The Council of Chief State School Officers sponsored a conference at Michigan State University, 3–5 November, to develop guidelines for use by state educational agencies in determining standards for science, mathematics, and modern foreign languages. John R. Mayor, AAAS director of education, served as director of the conference, and William Haskell of the *Science* editorial staff was one of the two writers assigned to prepare a conference report that will be given wide distribution.

The conference was held to aid state administration of federal funds received under Title III of the National Defense Education Act of 1958. The meeting was supported by the Educational Facilities Laboratories, an organization that was established recently by the Ford Foundation to promote better education through improved physical facilities.

Title III authorizes the spending of $61,600,000 per year in federal funds, to be matched by equal state expenditures, in grants to the states for the acquisition of laboratory and other special equipment for science, mathematics, or modern foreign language teaching in public elementary and secondary schools, and for minor remodeling of laboratory or other space to be used for such equipment. Funds will also be provided for "expansion or improvement of supervisory or related services in public . . . schools in the fields of science, mathematics, and modern foreign languages."

The U.S. Office of Education will administer the Title III program. State educational agencies will prepare plans for the use of federal funds in schools of their states and submit them to the U.S. Commissioner of Education for approval.

In addition to sponsoring the Michigan conference, the Educational Facilities Laboratories has announced the award of its first grant to aid implementation of the Education Act. A grant of $75,850 will support a nationwide study to determine what constitutes good design for physics building facilities. The 18-month study, which will begin in January 1959, is to be conducted under the joint auspices of the American Association of Physics Teachers and the American Institute of Physics.

Detailed information about existing physics facilities will be collected by questionnaire in a preliminary survey. It is anticipated that the results of the study will be made available to building planners as a series of booklets dealing with different facets of physics building design, microfilm records of photographs and building plans, and check lists. The records of the project will be stored in some central location for use by physicists and architects.

OEEC Summer School for Science Teachers

The second of the three pilot vacation courses for organizers of refresher courses for science teachers, arranged by the Office of European Economic Cooperation's Office for Scientific and Technical Personnel, was held at the Politische Akademie, Tutzing, near Munich, 4–15 August. Forty-five science teachers from 13 OEEC member countries, the United States, and Spain attended the course, which was designed to enable them to run similar courses for science teachers in their own countries.

The program included lectures and discussions on the teaching of physics, chemistry, and biology, with emphasis on how new and interesting types of classroom experiments can be arranged for school children. Special attention was also given to methods of incorporating nuclear physics into the teaching of school science. A third theme was the use of new methods, such as radio, television and films, in science teaching. The course was directed by Erich Baumann and Frank Ebner of the Bavarian Teachers' Association.

A third course in this series, which is planned by the OEEC as part of its drive to overcome the European shortage of scientists and technicians, is taking place in Paris this month.

News Briefs

The important role of Washington, D.C., in the development of the science of anthropology over the past 150 years is the subject of a special 2-month exhibition that opened this month in the Smithsonian Institution's Natural History Building. It portrays the contributions of many federal agencies and private Washington institutions to the fields of archeology, ethnology, linguistics, and physical anthropology. Sponsored jointly by the Smithsonian, the Library of Congress, and the Anthropological Society of Washington, the exhibition was planned to coincide with the November annual meeting of the American Anthropological Association and the AAAS annual meeting in December.

* * *

The first English translation of the Russian journal *Geokhimiya* has been released by the Geochemical Society, which plans to issue the journal regularly eight times a year. The project is aided by a grant from the National Science Foundation. The success of the venture will depend in large part on the number of subscriptions sold. The subscription price is $20 per year, $10 to educational institutions and to members of the Geochemical Society. For information, write to the managing editor, E. W. Heinrich, Mineralogical Laboratory, University of Michigan, Ann Arbor, Mich.

* * *

New facilities for studies in mathematics and physics at California Institute of Technology have been assured by a grant of $1,165,700 from the Alfred P. Sloan Foundation of New York. The gift will finance the remodeling of a building which for many years has housed the institute's experimental high voltage laboratory. This will become a modern five-story structure and will be renamed the Alfred P. Sloan Laboratory of Mathematics and Physics.

* * *

A simplified method of predicting satellite courses has been published for the benefit of volunteer observers by the National Academy of Sciences. With this manual, volunteers can utilize simple orbital elements—such as inclination of the orbit plane to the equator and distance to the center of the earth at the low point of orbit—to figure out where to