

THE NATIONAL SCIENCE FOUNDATION, WASHINGTON

AS in last year's report, rather more than half the ninth annual report of the (U.S.) National Science Foundation*, covering the year 1959, is occupied by appendixes listing the members of the National Science Board, its staff, committees and advisory panels, the grants for basic research and other purposes, grants for the International Geophysical Year programme, fellowship awards and publications, together with the financial report. About a quarter of the remainder deals with the re-appraisal and re-organization of the status of science in the United States, 1958-59, including a brief account of the two reports, "Strengthening American Science" and "Education for the Age of Science", coming from the President's Science Advisory Committee. This section, and the Chairman's foreword and the Director's statement, are discussed separately (see p. 341 of this issue); the remaining parts of the report, which review the activities of the Foundation itself, are reviewed here.

The significant increase in the support given by the Foundation to basic research in the United States from 25 million dollars in 1958 to almost 65 million dollars in 1959, should be noted first; this includes some 15.5 million dollars for research facilities, of which 12.3 million dollars were in support of facilities in mathematical, physical and engineering sciences. Support in the biological and medical sciences covers a wide range in developmental and environmental biology, systematic and regulatory biology. In genetic biology it is directed towards elucidating the nature of genetic material, the laws governing the transmission of hereditary traits, and the mechanisms controlling and determining the expression of hereditary characters; in metabolic biology, towards the mechanisms of protein synthesis and growth and specific metabolic factors which inhibit growth; in molecular biology, towards the investigation of the structure, synthesis and reactivity of peptides and proteins; and in psycho-biology, to the support of quantitative techniques in physiological and experimental psychology as these develop from mathematics and mathematical statistics.

In mathematical, physical and engineering sciences, a new programme for atmospheric sciences was established, under which the weather modification programme is now handled. Grants in chemistry were chiefly in organic and physical chemistry, while in the Earth sciences, support for oceanography was increased. In the engineering sciences, special reference is made to two grants in plasma dynamics, while the physics programme continued to place major emphasis on high-energy physics, particularly cosmic rays, and increasing attention was given to low-temperature research. Many of the facilities of the National Radio Astronomy Observatory are now approaching completion or actually in operation, and construction of the Kitt Peak National Observatory was started in 1959, where besides a 36-in. and an 84-in. reflector for stellar observations, it is proposed to instal a solar telescope with a parabolic

mirror 60 in. in diameter and a focal length of 300 ft.

An Office of Social Sciences was established during the year to support research and related activities in social science disciplines, for which grants during the year totalled 853,000 dollars, including anthropological sciences, sociological sciences, economic sciences and the history and philosophy of science. The Antarctic Research Programme, which received 2.3 million dollars, is supported on a geographical basis and an interdepartmental committee has been set up by the Foundation to examine proposals and programmes of the various agencies and the broad programme suggested by the Committee on Polar Research of the U.S. National Academy of Sciences.

Among the significant research developments of the year to which the report directs attention are the sunspot photographs obtained with the *Stratoscope I* 12-in. balloon-borne solar telescope; the resolution of the galactic nucleus Sagittarius *A* with the new 85-ft. Tatel radio-telescope at Greenbank, West Virginia; the use of a new technique of testing for perception of visual depth to throw light on native and learned factors in the perception of distance; the synthesis of a pituitary hormone of 13 amino-acids linked in a specific sequence resembling adrenocorticotrophic hormone in structure; the identification of a catalytic factor from blood which can transform 1,000-10,000 times its own weight of soluble fibrin into the insoluble form; the discovery of a mollusc thought to be extinct for nearly 300 million years; the establishment of migrations of *Sequoia* from tropical swamps 60 million years ago through adaptation to drier and cooler climates; and the development of a tetrahedral anvil which can generate pressures up to 100,000 atm. at 3,000° C.

During the year the Foundation sponsored and provided partial support for 41 scientific conferences and symposia and awarded 419 grants, totalling 330,000 dollars, to enable scientists to attend international meetings. Fellowship awards totalled 3,937, amounting to about 13.1 million dollars, and with those assisted under the research grants programme, the number of scientists assisted during the year was about 6,000. Of the fellowships, 965 were in the biological and medical sciences, 2,857 in the physical sciences (chemistry, 730; geological sciences, 195; engineering sciences, 558; mathematical sciences, 689; physics, 663), and 59 in the social sciences. Of the total, 1,100 were pre-doctoral, 194 post-doctoral and 83 senior post-doctoral; 302 science faculty fellowships were awarded for improving the quality of science teaching, as well as 628 summer fellowships to secondary school teachers of science and mathematics, 580 summer fellowships for graduate teaching assistants, and 1,050 co-operative graduate fellowships of 2,200 dollars for 12 months. The plans for improving the quality of science teaching by assisting teachers in secondary schools to extend their knowledge of science and of new developments comprise four main programmes on which 33.25 million dollars were expended in 1959. The summer institutes programme provided stipends to

* National Science Foundation. Ninth Annual Report for the Fiscal Year ended June 30, 1959. Pp. xvii + 274 (12 plates). (Washington, D.C.: Government Printing Office, 1960.) 1 dollar.

20,000 participants. Besides teachers in secondary schools and colleges attending 348 'courses' varying in length from 4 to 12 weeks, 515 teachers and supervisors in elementary schools received training in 12 summer schools; technical school personnel were provided for in two experimental summer programmes and 546 college teachers of science and mathematics attended 20 summer conferences dealing with special fields of science and mathematics. Under the Academic Year Institute programme, providing a year's study in science and mathematics for secondary school teachers, awards were made to 32 colleges and universities, and it is estimated that the 1959-60 programme will support more than 1,500 teachers; while opportunities for further study in out-of-school hours will be provided to about 9,000 secondary school teachers under the In-Service Institutes programme. Special projects in science education on which nearly 9 million dollars was expended cover visits of scientists to secondary schools, the provision of a travelling science library of carefully selected books for high schools, a travelling science demonstration lecture programme for secondary schools and support for summer training of secondary school students. The State Academies of Science, the College Programme and Teacher Improvement Programmes provide for visits by scientists, and foster the participation of undergraduates in research, supplementary training for science teachers and eight special field institutes covering advanced training in highly specialized subjects. On the Course Content Improvement Programme, a further 6 million dollars was expended on projects in elementary and secondary schools and in colleges; this included supplementary teaching aids such as films and television. Activities under the International Science Education Programme initiated during the year include the improvement of science curricula and the training of teachers and also measures to assist science students and scientists to engage in international educational programmes.

The Scientific Man-Power Programme, on which 780,000 dollars was expended in 1959, besides maintaining the National Register of Scientific and Technical Personnel, initiated surveys of scientific and technical employment in private industry and State Governments, of scientific and technical personnel in colleges and universities, and of scientists and engineers in Federal Government employment engaged in research, and pilot studies of the demand for scientists and engineers in several industries. Reports were completed on the knowledge of foreign languages of American scientists in 1954-55, on scientists and engineers in American industry in January 1957, and on employ-

ment and other characteristics of American scientific man-power during 1954-55. The measurement and appraisal of the national research and development effort is a major responsibility of the Foundation, and its Office of Special Studies has now completed its surveys of the year 1953-54; its present programme of statistical surveys proposes a detailed survey of each sector every four or five years, summary data only being collected in the intervening years. During the year, a survey was made of expenditure on scientific research and development in the fiscal years 1958, 1959 and 1960, and a survey of scientific research and development expenditure and man-power in colleges and universities during 1957-58 is now being conducted, following the publication of the report on the 1953-54 survey.

During the year, further responsibilities for improving the availability of research information to scientists were assigned to the Foundation by the National Defense Education Act, 1958, and accordingly the Office of Science Information Service and the Federal Advisory Committee on Scientific Information have been established. For the dissemination of scientific information, 146 grants totalling 3.8 million dollars were made for such purposes as documentation research, the international exchange of scientific information, the support of scientific publications and information services and the dissemination of unpublished research information such as unpublished Government research reports. Studies of the flow of information among scientists and of the scientific activity of chemists were completed during the year and five mechanical translation projects are at present supported, as well as the effort of 28 professional societies and academic institutions in providing translations of 35 Russian scientific and technical periodicals and 18 books and monographs. A Foreign Technical Information Centre has been established in the Office of Technical Services of the Department of Commerce, where scientific and technical translations prepared by Government agencies are collected, and their availability is announced. Support of scientific publications covered the issue of *Physical Review Letters*, an experiment in rapid low-cost publication of short, up-to-the-minute articles on physical research, support for the *Journal of Geophysical Research* and a grant to enable *Biological Abstracts* to extend its coverage; while grants in support of information services include one to the Bio-Sciences Information Exchange, administered by the Smithsonian Institution, and continued support to the Office of Critical Tables of the U.S. National Academy of Sciences.

THE PUBLIC AND THE BROADCASTING PROGRAMMES IN BRITAIN

THE British Broadcasting Corporation has issued a report on an inquiry carried out at the end of 1958 by its Audience Research Department*. Its first chapter describes the public and the facilities which are available for listening and viewing, com-

* British Broadcasting Corporation. *The Public and the Programmes: an Audience Research Report on Listeners and Viewers, the time they devote to listening and viewing, the Services they patronize, their Selectiveness and their Tastes*. Pp. 71. (London: British Broadcasting Corporation, 1959.) 8s. 6d.

paring the public which depends solely on sound broadcasting with that which has television as well, and also contrasting viewers who can receive B.B.C. television only, with those who can also receive independent television. The following three chapters deal successively with listening in the evening, viewing in the evening and listening in the day-time, contrasting the amount of listening or viewing, the selectiveness of listeners or viewers and the dis-