

cities during 1952. A half-million Latin Americans have seen the exhibit since 1950.

In the realm of scientific documentation, a series of reviews of Latin-American contributions to science is in preparation in English, with volumes on physics, chemistry, astronomy, and other sciences.

Working far from the big research centers and without well-equipped libraries, the scientists in Latin America find it difficult to obtain the scientific information and material they need. During 1952, the Office received a great number of requests for scientific information, bibliographies, publications, microfilms, and other material. Because of the close relations the Office maintains with leading documentation centers and research institutions all over the world, and with other Unesco Science Cooperation Offices, it can usually find quick answers to such requests. It has been able to procure information and material for which a research worker might have searched years without success. Microfilms amounting to about 5500 pages of text were supplied, during 1952, to institutions and individual workers from every section of the continent, as well as other parts of the world.

Besides the above items a large number of other activities, such as the maintenance of a reference library, technical assistance in a variety of fields, other conferences and symposia, special lectures and radio broadcasts, and the compilation of bibliographies on specific subjects for various organizations are carried on by the Science Cooperation Office. The entire program is coordinated with other agencies of the United Nations, such as the World Health Organization and the Food and Agriculture Organization, and in the four years of its existence it has come in contact with much of the scientific work of Latin America.

National Science Foundation

Federal Funds for Science

Some months ago the National Science Foundation issued a preliminary analysis of a study of that part of the Federal research and development budget represented by grants and contracts from Federal agencies to nonprofit institutions (see *Physics Today*, VI, 1, 22, January 1953). The Foundation's full report on this study has now been made available, and while there have been no very significant changes in the picture shown by the preliminary analysis, the final report provides a considerably more detailed breakdown of the disposition of funds than was contained in the earlier release.

In brief, the Science Foundation reports that federal funds for scientific activities of all kinds amounted to 2.2 billion dollars in the year ending June 30, 1952. Of this amount, \$338 million were for scientific research and development at nonprofit institutions, which represents an increase of \$44 million since the preceding year. The report states that comparable data for years prior to 1950-51 are not available, but it is indicated that in rough figures such support amounted to no more

than seven or eight million dollars annually before 1940, and that during the war the amount increased greatly to an annual rate in 1945 of perhaps \$225 million; in the period 1945-50, there was at first a decline and then a slow build-up culminating in a level about equal to the war peak.

In 1951-52, seventeen agencies administered funds for research and development at nonprofit institutions, of which four administered 98 percent of the total. These four were the Department of Defense with \$178 million (53 percent), the Atomic Energy Commission with \$121 million (36 percent), the Federal Security Agency with \$18 million (5 percent), and the Department of Agriculture with \$13 million (4 percent). All other agencies administered approximately two percent of the funds.

Nearly half of the total funds were dispersed for the operation of research centers by nonprofit institutions. In the nature of the work they do and in their size, organization, and methods of operation, the report observes, these centers resemble Government laboratories more closely than the usual research and development activities of nonprofit institutions. The Government sets the objectives and general work plans of the center and supplies funds to operate it, while the parent institution provides chiefly managerial services. In 1951-52, there were 24 research centers, 15 of which were operated for the Department of Defense, 8 for the Atomic Energy Commission, and one for the Reconstruction Finance Corporation. Together they received \$159 million of the \$338 million total.

About one out of every five dollars of the funds going to nonprofit institutions in 1951-52 was for basic research. The other four were required for applied research development and large-scale additions to the research and development plants of nonprofit institutions. Work in the physical sciences received greatest emphasis, accounting for 72 percent of the total funds, as against 19 percent for the life sciences, 3 percent for the social sciences, and 6 percent for increase of research and development plant. When the work of the research centers is excluded, the disparity between the physical sciences and the other fields is considerably less.

A fairly sizable number of institutions received funds. In 1950-51, there were 395. In 1951-52 this number increased to 427. Of the latter number, 24 were in foreign countries. The remaining 403 included 225 educational institutions, 80 hospitals and related institutions, 48 independent research organizations, 3 special research organizations created as research centers for the Government, and 47 miscellaneous organizations. The educational institutions clearly outranked other types of institutions. As a group, they constituted slightly over half of the institutions, but, more significantly, they received 87 percent of the total funds.

There are at the present time about 1900 institutions of higher learning of all types in the United States. As an outside estimate, only about 700 of these are judged to have immediate potential capacity to do scientific research and development. Of this number, one-third

received federal funds during the fiscal year 1951-52.

It is significant, in this connection, to find a tabulated illustration of one phase of the difficulties facing liberal arts colleges. Comparison of the federal funds received by educational institutions (as differentiated from other nonprofit institutions) shows that liberal arts colleges, constituting in number 78 percent of all educational institutions having present or potential research capacity, received only 3 percent of the funds distributed in 1951-52. Universities, on the other hand, received 77 percent of the funds even though they represent less than 13 percent of the institutions listed. Professional-technical schools, constituting 9 percent of the total institutions, received 20 percent of the funds. Based on enrollment in the fall of 1951, the average university had a student population of 9000, compared with 1000 for the liberal arts college and 2000 for the professional-technical school. Total enrollments were 798,300 for universities, 621,200 for liberal arts colleges, and 124,000 for professional-technical schools. The report, however, takes note of the argument that universities received the greatest portion of the funds because they are on the whole larger and better equipped to do research and because the conduct of research is closely associated with graduate study and the universities have far more facilities for graduate study than have the other institutions.

The predominant part played by universities in the program of government-sponsored scientific research and development is further emphasized by the fact that only two universities out of 88 did not receive Federal funds during 1951-52. Of the 538 colleges having present or potential research capacity, only 95 received funds, and of the 61 professional-technical schools, 41 received funds. 91 percent of the funds went to 50 of the two-hundred-odd educational institutions receiving federal support. 39 of these 50 institutions are universities, 10 are professional-technical schools, and one is a liberal arts college. The latter appears only because of a research center which it operates for the Reconstruction Finance Corporation. When support for research centers operated for the Government by nonprofit educational institutions is excluded, the ranking 50 institutions received 83 percent of the funds distributed in 1951-52.

"In recent years," the report concludes, "there has been a growing tendency toward a formalization of research activities in educational institutions. Federally sponsored research work has probably accelerated this trend. The research centers are the most obvious examples. But aside from work done in the centers, there is apparent an increasing tendency to separate research sponsored by the Government and others from the normal instructional activities of the institutions. As this trend grows, the value of sponsored research for educational purposes is lessened. Based on the data available from this study, it appears that about half of the funds now going to educational institutions contribute little to the primary objectives of these institutions. There is also a growing movement toward

formalization in the activities paid for by the remainder of the funds which in time may reduce their value for educational purposes."

Copies of the report (published under the title, *Federal Funds for Scientific Research and Development at Nonprofit Institutions, 1950-51 and 1951-52*) may be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at a cost of 30 cents each.

International Relations Centers

Program Announced by NAS-NRC

A series of centers designed to assist foreign scientific visitors in establishing contacts in this country with people in their fields and, in general, in making their stay here as effective as possible has been proposed by the Office of International Relations of the National Academy of Sciences-National Research Council. Under study for the past year by the Cooperative Research Foundation (CORE), the program was to be activated August 31, 1953 with the opening of the first regional center at the Morrison Planetarium, Golden Gate Park, San Francisco. Other such centers will be located in similar areas of concentrated scientific endeavor, and are to act as coordinating agencies for international scientific activities in their vicinities.

Foreign Scientists

Changes Urged in Visa Procedure

Participation of foreign scientists and scholars in meetings and conferences in the United States would be facilitated under the terms of two resolutions introduced by Representative Charles S. Gubser of California on July 27. These resolutions acknowledge that "the contribution of such aliens to the advancement of scientific and scholarly knowledge by their participation in such meetings, conferences, temporary employment, and other transactions in the United States is essential to the national defense and the furtherance of the industrial, technological, and cultural leadership of the United States," and provide for prompt decisions on nonimmigrant visas for foreign scholars with a review board including scientists and scholars in its membership being available in the event of unfavorable decisions by the consul. The temporary admission of aliens otherwise specifically excluded by some sections of the McCarran Act would be made possible by the resolutions, which were referred to the House Judiciary Committee.

NBS Loses Four Divisions

Ordnance Work Transferred to Defense

The National Bureau of Standards was scheduled to undergo major surgery on the first of this month when four of its ordnance research and development activities were to be removed from the Bureau and transferred to