

the æther, and were all in agreement with the electrical theory of matter—but still, when Einstein showed that the law of composition of velocities appropriate to his principle of relativity accounted for them all as an immediate corollary, without effort and without any assumption beyond

what was embodied in that principle—this feature of directness naturally aroused the keen attention of physicists.

(Discussion of the relative velocity of light is deferred to next week.)

(To be continued.)

Endowment of Scientific Research in the United States.¹

IN NATURE for May 29, 1919, an account was given of the organisation of the National Research Council of the United States of America. Supported during the war largely by the Government, but now entirely by private bodies and firms (it has lately received a grant of 5,000,000 dollars from the Carnegie Corporation), this body owes its existence to a trend of opinion by no means confined to the capitalist classes which maintain it. The American Federation of Labour explicitly and emphatically professed its belief in the fundamental importance and beneficent results of scientific research—more especially research in pure science—in a manifesto quoted in the Report for 1918-19 of our own Department of Scientific and Industrial Research. This unanimity on the part of employer and employed in their recognition of the importance for the development of American industries of the promotion of research gives additional weight to the imposing array of facts and figures assembled by the National Research Council in the bulletin under notice, which deals with funds, other than Federal and State funds, available in 1920 for this purpose.

In the preparation of the following summary it has been assumed that where the total endowment, but not the amount annually available, is given in the bulletin, 5 per cent. of this total was available. In some cases no information is given as to the amount of the fund—either capital or interest—and these were necessarily omitted in compiling the money totals. The columns A, F, U give the number and aggregate annual value in *thousands of dollars* of the funds provided by, or in connection with:—A: academies, associations, societies, and museums; F: foundations, hospitals, and research institutes; U: universities and colleges.

	A		F		U	
	No.	1000 dols.	No.	1000 dols.	No.	1000 dols.
I. Medals and prizes	65	19	1	—	24	20
II. Grants	40	361	8	15,143	66	96
III. Institutional funds	14	255	30	2,322	176	2,056
IV. Fellowships and scholarships	6	34	6	120	263	352
Total	125	669	45	17,585	529	2,524

The most conspicuous figure in this table is the amount of the grants by foundations, etc., and this is almost entirely composed of appropriations (amounting to 15,000,000 dollars) made by the Rockefeller Foundation, New York City, "partly

to agencies which it creates for carrying out specific programmes, and partly to other existing organisations to enable them to carry out specific programmes." Several other important annual appropriations are detailed below.

Source	Amount (1000 dols.)
Rockefeller Institute for Medical Research	1,100
Carnegie Institution of Washington—for research in astronomy, 221; physics, 329; botany, 65; biology, 131; nutrition, 52; eugenics, 31; embryology, 43	872
Carnegie Institution, minor grants	117
American Museum of Natural History— for promotion of research, exploration, etc.	278
Harvard Fund for medical research	363
J. De Lamar Funds for study and teach- ing of dietetics and of the origin, etc., of disease	377
John McCormick Institute for Infectious Diseases Research Fund	100
National Research Council fellowships for research in physics and chemistry	100
Massachusetts Institute of Technology, general budget appropriation for re- search	100

Thus, of the aggregate amount of the sums specified in the bulletin—20,778,000 dollars—more than 82 per cent. is attributable to Rockefeller and Carnegie benefactions, and more than 88 per cent. to these and the six other sources specified.

At the recent congress at Oxford of representatives of the universities of the British Empire much emphasis was laid on the fundamental importance of scientific research and on the necessity for providing material aids and training for it. The figures given above constitute a striking commentary on the following observations made by Prof. Joly at the congress: "Perhaps the most striking feature of American universities, as viewed by the British visitor, is the prevalence of research, and the lavish provision made for its prosecution. . . . There is research in everything. The American recognises to the full the value of the mental attitude induced by research, and this recognition is not confined to the university professor, from whom it may be expected, but extends, so far as I could gather, everywhere throughout the States." At some future date the National Research Council will perhaps take stock of the results of the application of these vast sums of money, and may possibly have a tale to tell of misdirected or unfruitful effort; but it can scarcely be doubted that the net results will affect substantially the welfare of mankind—perhaps so

¹ "Funds available in 1920 in the United States of America for the Encouragement of Scientific Research." Bulletin No. 9 of the National Research Council, 1701 Massachusetts Avenue, Washington, D.C., March, 1921. 1 dollar.

substantially as to give a new significance to the phrase "Almighty Dollar," and to affect the sociologist's estimate of the social order which has made possible the accumulation of multi-millionaire fortunes.

In a "Subject Index" the bulletin lists all the funds known to be available for the support or encouragement of research in the biological, mathematical, and physical sciences and their applications, and from this index has been prepared the following table, which, though not exhaustive, serves to indicate the subjects more generally favoured by founders and administrators of funds:—

Subjects	No. of Funds
Agriculture	12
Anthropology	24
Astronomy	33
Biology	36
Botany	13
Chemistry	57
Engineering	32
Geography	16
Geology, etc.	18
Industrial research	47
Medicine	147
Mineralogy	13
Pharmacology	14
Physics	49
Science, unrestricted (including appropriations of the Rockefeller Foundation)	120
Zoology	14

In the list of nine large endowments already given above, the ample provision for medical research is noticeable. Columbia University has a fund for cancer research producing 70,000 dollars per annum, and four other funds produce 291,000 dollars per annum for medical research. Cornell has 45,000 dollars per annum for research in veterinary medicine. Pennsylvania has lately received 500,000 dollars towards a tuberculosis research institute, and Iowa has a Welfare Research Station Fund for investigating "scientific methods of conserving and developing the normal child," for which it appropriates 25,000 dollars per annum.

A few other noteworthy funds may be particularised:—

Anthropology and Natural History.—Bishop Museum of Polynesian Ethnology, etc.: Research funds, 75,000 dollars per annum.

Bio-chemistry.—Leland Stanford Junior Food Research Institute: 700,000 dollars provided by the Carnegie Corporation for its support for ten years.

Engineering and Industrial Research.—United Engineering Societies' Fund, 500,000 dollars (capital). American Society of Heating and Ventilating Engineers: 21,000 dollars per annum for five years. Du Pont de Nemours Company Fellowships for Research in Chemistry in twenty-one universities: 750 dollars each.

Science, unrestricted.—Smithsonian Institution, Washington: Founded 1846, present fund 975,000 dollars. Brooklyn Institute of Arts and Sciences: Fund for research purposes of the museum, 600,000 dollars.

Mention may also be made of two foundations having an international character:—The American Field Service Fellowships for research in French universities: 30,000 dollars per annum; and the American Scandinavian Foundation, providing twenty travelling fellowships of 1000 dollars each.

The publication of this interesting bulletin provokes the question, What similar lists have been published in other countries? Particulars of scholarships, etc., open to graduates are to be found in the "British Empire Universities' Year-book," and it is understood that in the next edition information regarding other funds available for the encouragement of scientific research will be given; but in the meantime the only published lists comparable with those given in the bulletin are, it is believed, the lists of "Encouragements et Aides Financiers" included in a recently published work by MM. Tassy and Lérís called "Les Ressources du Travail Intellectuel en France." The annual value of prizes distributed in France by the national academies and by societies dependent on private initiative is stated to exceed 1,500,000 francs, and an almost equal amount is said to be devoted to subventions to missions, travelling fellowships, and other aids to research.

Obituary.

LORD REAY, formerly Governor of Bombay, and an active worker for intellectual interests in many directions, died on August 1 in his eighty-second year. From a detailed notice in the *Times* we extract the following particulars of his career: Born on December 22, 1839, Lord Reay was educated at the Gymnasium at The Hague and at the University of Leyden, where he graduated in laws. In 1866 he made a tour through the

United States for the purpose of studying the social and political condition of the country at a particularly interesting period of reconstruction. On his return to Holland he was elected president of a Society for the Promotion of Manufactures and Handicrafts, and in that capacity he organised the first industrial exhibition which was ever attempted in Holland. In 1871 he was returned to the Chamber of Representatives of the States-