the core and we may rest assured that the subjects will gain rather than lose in their value to the students.

Students have justly complained that so many required subjects fill the curricula that they can not elect in their special field of interest during their last two years. At Barnard College the students have petitioned for such general survey courses in many subjects as that outlined here for biology.

Most of our academic trees carry much dead wood. Can not other collegiate subjects profitably eliminate much detail which now seems sacred in the elementary course and thus open the way for more intensive study in the later years of the students' curriculum?

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COOPERATION OF THE GOVERNMENT IN SCIENTIFIC WORK

IN view of the growing interest in cooperation as a means of advancing scientific work for the public benefit, the National Research Council in 1921 appointed a committee to study the nature and extent of cooperative scientific work carried on by the federal government and outside agencies as well as the principles which should guide in such work. This committee consisted of E. W. Allen, chief, office of experiment stations, United State Department of agriculture, chairman; Edwin F. Gay, president, New York Evening Post, Inc.; M. W. Glover, bureau of chemistry, United States department of agriculture; N. C. Grover, geological survey, United States Department of the Interior; Vernon Kellogg, permanent secretary, National Research Council; and E. B. Mathews, state geologist for Maryland and professor of geology, Johns Hopkins University.

The committee's report, which has just been made public by the council, shows a great diversity as to types of work, agencies cooperating, nature of cooperation, terms of agreement and extent of participation of the parties to it. The inquiry revealed 553 separate cooperative projects, involving more than 1,100 cooperative undertakings, since many of the projects involve the work of several cooperators. Of the 553 separate projects, 360, or nearly two thirds, fall under the head of research, the acquisition of new knowledge by the method of systematic scientific investigation; others deal with routine testing and technical service; gathering of statistics; enforcement of regulatory laws or measures; and the like.

The federal agencies engaged in the cooperative work included some 23 bureaus and independent establishments of the government, and the outside cooperating agencies included various branches of the state governments, municipalities, chambers of commerce, state and endowed universities, agricultural colleges and experiment stations, botanical gardens, and similar institutions, as well as associations and societies of various kinds and numerous industrial concerns and private individuals.

The forms of agreement or understanding entered into between the cooperating parties are very diverse. As a rule, however, they are quite definite, and in general, "convey the impression of having been developed in the spirit of cooperation and with a view to avoiding misunderstanding."

The combined cost to federal and outside cooperators of the definitely organized scientific work in which the government is concerned aggregated, as far as the available data show, more than $41,000,000 for the year under consideration. Of this, over $14,000,000 came from the federal government and nearly $27,000,000 from outside agencies. If the assistance other than money is included, it appears that the outside cooperating agencies are putting in fully two dollars for every one supplied by the government. As the report states, however, "the influence of the federal government in stimulating new movements for the application of science can rarely be measured by the amount of funds it has contributed. It has served to nationalize many types of effort important to the intelligent advancement of the country, and has greatly hastened the development of such measures."

Of the federal agencies concerned, the United States Department of Agriculture has the largest number and the widest range of coopera-

tive undertakings. The report shows that the cooperative work covers the entire country and includes broadly "the study of the principles of agricultural science, the determination of agricultural resources and special adaptations, the discovery and introduction of improved or better-suited methods, the establishment of new crops, the improvement of plants and animals, the marketing of products, and the safeguarding of agriculture from a long list of enemies."

The cooperative enterprises to which the department of agriculture is a party, excluding cooperative extension and experiment station work, road building and management of forest reserves, involved in 1921 a total expenditure of nearly $15,000,000, of which the department supplied $5,844,307.

Leading purposes of the central government in fostering cooperation have been to provide for the more adequate scientific investigation of matters of general interest from a national or regional standpoint and to promote nation-wide movements of various kinds. As pointed out in the report, "the scientific work which the government, the states and local institutions are called upon to perform is so vast and so varied that it is beyond the ability of a local or national agency to accomplish, working alone. Much of it is regional or national in importance or is for the benefit of science as a whole. To prevent its being fragmentary and disconnected, systematized effort is manifestly important."

The survey shows that cooperative scientific work is on a large scale and steadily increasing. In fact it is evident, as the report states, that such cooperation "has become a recognized principle of government." The number and range of the cooperative projects make it clear that "the states have no hesitation in joining hands with the federal government in carrying on research and development work of interest to them. . . . And that there is a manifest tendency on the part of the states to seek the aid of the federal government in measures of general or regional interest, and to link their efforts with those of the central agency, is shown by the fact that such proposals frequently originate locally."

SCIENTIFIC EVENTS

SCIENTIFIC RESEARCH IN AUSTRIA IN 1922[1]

IN a short report to the government, which demonstrated the meagerness of the regular appropriations to the scientific research institutes, Professors Becke and Rademacher asked for larger appropriations, and enumerated the most important investigations conducted last year in this country. Apart from the publications dealing with the geographic and ethnographic researches in the Balkans in 1915-1918, when our armies occupied these countries, the results of which were made known in 1922, one of the most important papers was that by Dr. Schedler, who made geomagnetic surveys in thirty different places and found marked differences and changes from the values heretofore accepted.

The Vienna Radium Institute, a private concern, has done excellent work in the investigation of radioactive substances. It has been shown that the age of certain mineral deposits can be estimated according to the proportion of transformation or decay of the radioactive substances contained in them. While the uranium-pitchblende of Bohemia is about 200 million years old, in Norway there are minerals at least twice as old, and in Ceylon the layers of thorianite have been found to be at least 500 million years old.

A tremendous amount of work is still going on in the biologic institute (Vienna). Here the problems of transplantation have attracted the attention of a number of gifted investigators. The pupils of Przibram study especially the physiology of transplanted eyes, hearts and legs. Koppanyi has succeeded in transplanting eyes in rats, and these eyes seem to be functioning. At a recent meeting of the Vienna Ophthalmologic Society, his experiments were vehemently attacked by the oculists, but just as vehemently defended by the physiologists. Dr. Weiss transplanted entire limbs in amphibia, exchanging, for instance, arms and legs, and demonstrated that these transplanted limbs functioned normally after

[1] From the *Journal* of the American Medical Association.