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WORK OF THE NATIONAL RESEARCH COUNCIL[1]

THE National Research Council has had a year of much activity and, as it seems to the secretary, of creditable achievement. The work has been carried on along the lines and by the methods which have gradually come, through experience, to be recognized as probably the most advantageous ones which the council can adopt. These lines of work and methods involve and maintain a very wide contact on the part of the council with the scientific organizations and men of this country and of various foreign countries, these organizations and men representing both fundamental science and its applications. The actual membership of the council, which democratically controls the council's policies and work, is chiefly composed of accredited representatives of more than seventy national scientific and technical societies. Relations with foreign workers and organizations are closely maintained through the International Research Council and its affiliated International Unions, representing different special fields of science. Certain of the National Research Council's special divisions of science and technology are the officially recognized American sections of the International Unions.

Contact with the colleges and universities of the country is maintained by the council especially through its division of educational relations; with the government's various scientific bureaus through the division of federal relations; and with the activities of the various state scientific boards and bureaus through the division of states relations. Relations with the industrial research laboratories of the country, and with applied science in general, are maintained through the council's divisions of engineering, research extension, physics, and chemistry and chemical technology.

The council has been entrusted during the year with the responsibility of expending considerable sums of money given by various foundations, industrial concerns and individuals for the support of various special undertakings in the way of promotion, organization and carrying out of scientific work and research.

[1] Statement of activities for the year July 1, 1922–June 30, 1923, based on a fuller report made to the Carnegie Corporation of New York, from which the Council, through the National Academy of Sciences, derives an annual income.

These will be specifically referred to later in this report. The total budget for the year, not including the money spent in constructing the new building for housing the National Academy of Sciences and the Council, has been about half a million dollars.

NEW BUILDING

Work has gone forward steadily on the construction of the monumental new building in Washington for the joint use of the academy and the council, and the building should be ready for occupancy in the late autumn of this year (1923). The building is situated on the block of land lying between 21st and 22nd and B and C streets, and faces the Lincoln Memorial. The land was purchased at an expense of about $185,000 provided by gifts from twenty private donors. The total cost of the building and equipment will be about $1,350,000.

RESEARCH FELLOWSHIPS

Perhaps the most outstanding new undertaking of the council during the past year, and that one supported by the largest new gift of money, is the establishment of a series of post-doctorate research fellowships in the biological sciences, including zoology, botany, general physiology, anthropology and psychology. For these fellowships the Rockefeller Foundation has pledged to the council $325,000 to be expended during the five-year period, July 1, 1923–June 30, 1928, no more than $75,000 to be expended in any one year.

These fellowships in the biological sciences, added to those already similarly provided for by the Rockefeller Foundation in physics and chemistry ($500,000 to be expended during six years) and by the Rockefeller Foundation and General Education Board, jointly, in the medical sciences ($500,000 to be expended during five years), constitute a most important addition to the possibilities of actual research work in this country as well as an opportunity for the development of a group of carefully selected, highly trained and eager research workers. The total sum of $1,325,000 available to the council for the maintenance of these fellowships will provide comfortably for the work, for a number of years, of about 100 competent fellows each year.

The selection of these fellows and the general supervision of their work and the administration of the special funds for their maintenance are in the hands of three special boards of eminent scientific men chosen by the council.

SPECIAL CONFERENCES

One of the most satisfactory methods used by the council in connection with the promoting, planning and organizing of new undertakings or research projects, especially those in which a considerable cooperative effort is aimed at, is the calling together of special conferences of selected experts from all over the country to meet with officers and members of the council for the consideration of the best methods of attacking special problems and for planning and organizing the research needed in connection with them. Out of such conferences have grown a considerable number of permanent or temporary special organizations, or active major committees which carry on, under the general sponsorship of the council, the actual work of research and organized undertaking.

Among such conferences held during the past year may be mentioned one arranged for by the Advisory Board on Highway Research (November 23, 1922); one on Problems of Human Migrations, with special consideration of the scientific aspects of immigration into America (November 18, 1922); one on Occupational Terminology and Specifications, called by the special request of the Secretary of War (January 6, 1923); one on Vocational Guidance (January 26, 1923); one composed of Scientific Instrument Makers and Users (March 23 and 24, 1923); one on Scientific Bibliography in general and the work of the Concilium Bibliographicum in particular (March 31, 1923); and one of workers in Cattle-breeding (April 27–28, 1923).

CROP PROTECTION INSTITUTE

This institute for the promotion and maintenance of research in connection with the insect and plant pests of American crops, which was developed by the initiative and assistance of the council, and comprises a membership of nearly 300 professional economic entomologists, plant pathologists and agricultural chemists, together with representatives of 41 chemical and general industrial companies interested in the manufacture of fungicides, insecticides and apparatus for their use, is now a permanent and self-supporting organization of much vigor and activity. During the past year it has had about $35,000 to spend on research projects and has, in addition, maintained three special research fellowships.

Another scientific institute, similarly set up largely by the initiative and under the sponsorship of the council for the promotion of more scientific methods in the making of chronometers, watches and other related instruments of precision, and known as the Horological Institute, is now on a permanent and practically independent basis, and is showing a praiseworthy activity.

CONCILIUM BIBLIOGRAPHICUM

This institution of biological bibliography, established in Zurich, Switzerland, in 1895 by a well-

known American zoologist, Dr. H. H. Field, and which had developed a useful system of prompt bibliographic service in both card and book form for zoologists, anatomists, physiologists and paleontologists, was nearly wrecked by the war and the sudden death of the founder and manager. As about one third of the subscribers to its bibliographic service were American universities, libraries, scientific organizations and workers, it seemed advisable to try to bring special American effort and support to bear on the situation.

The National Research Council, with the financial assistance of the Rockefeller Foundation to the extent of $85,000, has been able to rehabilitate the concilium and to arrange to assist in its maintenance through a period of five years. The concilium, with Dr. J. Strohl, of the University of Zurich, at its head, has been thoroughly reorganized during the past year under the direction of a special commission representing the National Research Council and the Swiss Society of Natural Science, and has nearly caught up with its preparation and distribution of bibliographic references to papers and books published during and since the war.

UNION OF AMERICAN BIOLOGICAL SOCIETIES

There is nearly a score of major American national biological societies, each representing the interests of a special limited field of biology, but there has been little affiliation or cooperation among them to advance the interests of biology in general. Yet there has been constant need of this, in connection particularly with such general interests as proper means of publication and of the abstracting and indexing of publications and of biological bibliography in general.

The National Research Council, through its division of biology and agriculture, has, on request, interested itself energetically in this matter, and has materially helped in the formation of a Union of American Biological Societies, to which eighteen major societies, including Sections F, G, N and O of the American Association for the Advancement of Science, have now formally given their adherence.

After several preliminary conferences, official representatives of all these societies met in the council's rooms in Washington on April 26 of this year and organized a council of the union and then appointed a smaller executive committee. At this meeting, also, a Joint Publications Committee of the Union and the division of biology and agriculture of the National Research Council made a report on the problem of providing all of biology with adequate abstracting and indexing facilities.

RECENT IMPORTANT PROJECT COMMITTEES

Among the recent major committees of eminent important research undertakings is one on research men of science set up to organize and develop certain on sex problems, composed of members representing the special sciences of biology, physiology, psychology, psycho-pathology and sociology. This committee was organized in 1922 and made a preliminary report on policy and program for its work in March of that year. A sum of $25,000 was made available for the support of the work during the year July 1, 1922–June 30, 1923 by a private donor and the committee has outlined and supported a series of specific investigations during the year, most of which have yielded substantial results. The committee has formulated a program of work for the next two years, which has been assured of financial support to the extent of $50,000 a year.

Another important committee of distinguished membership, representing various fields of biological science and of sociology, has been established by the council for the study of scientific problems of human migrations, with especial regard to American immigration problems. The organizing work of this committee has been supported during the past year by a gift of $5,000 from the Russell Sage Foundation. The committee has carefully prepared an extended program of biological, psychological, sociological and economic special investigations, to carry out which the Laura Spelman Rockefeller Memorial has given $60,000 to the council.

A committee for aiding Russian scientists to obtain American scientific books, journals and papers published since January 1, 1915, was organized by the council, but because of the council's relation to the government through the National Academy of Sciences, was reorganized as a private committee under the chairmanship of the permanent secretary of the council. A cooperative arrangement was established with the American Relief Administration engaged in extensive relief work in Russia under the chairmanship of Honorable Herbert Hoover. By this arrangement all work and expenses of warehousing, repacking, over-sea transportation and final detailed distribution in Russia were assumed by the American Relief Association. Requests were sent by the committee to American publishing houses, government scientific bureaus, national scientific societies and individual scientific men for gifts of scientific publications made since January 1, 1915, with the result that over twelve tons of such scientific publications were received and have been safely sent to Russia and distributed there among the major Russian universities and scientific associations. A host of grateful acknowledgments from Russian scientific organizations and men has been received.

The status and work of various other committees established to plan and undertake research on various problems will be referred to later in this report in connection with reference to the activities of the council's various divisions.

PUBLICATIONS

The council has published thirteen numbers in its bulletin series (major and technical papers usually of considerable length) during the year, and eleven in its reprint and circular series (shorter and usually more general papers). It has now in press five numbers in its bulletin series and two numbers in its reprint and circular series. The total number in the bulletin series is now thirty-one, and forty-three in the reprint and circular series. In addition the council has published a considerable number of miscellaneous papers, of which twenty-five have appeared during the past year.

Among the publications of the year have been an important group (in the bulletin series) prepared by the various special committees of the division of physics, which set out the present status of scientific knowledge in various particular fields of physical science, as magnetism, celestial mechanics, luminescence, atomic structure, acoustics, electrodynamics of moving media, etc. An important study of "Cooperation with the Federal Government in Scientific Work" has been prepared and published at the initiative of the council's division of states relations. Among other important publications of the year is a report on highway research in the United States, being the results of a census conducted by the council's advisory board on highway research in cooperation with the U. S. Bureau of Public Roads. Among the numbers in the reprint and circular series published during the year are two giving important lists of manuscript bibliographies in chemistry, chemical technology, astronomy, mathematics and physics. Also a useful list of research chemicals now manufactured in the United States. Among the miscellaneous papers published during the year is a series of "career bulletins" prepared, at the request of the council's division of educational relations, by eminent scientific men representing different fields of scientific work, setting out the opportunities offered for a scholarly career in each of these fields. These "career bulletins" are furnished in any number on specific request from university presidents and deans for distribution among selected graduate and upper class undergraduate students.

ACTIVITIES OF DIVISIONS AND DIVISIONAL COMMITTEES

Division of Foreign Relations.—The council's division of foreign relations arranged for the appointment and attendance of official representatives of the council at meetings in the summer of 1922 of the International Research Council in Brussels, International Astronomical Union at Rome, International Geodetic and Geophysical Union at Rome, International Union of Pure and Applied Chemistry at Lyons, International Union of Scientific Radio Telegraphy in Brussels and International Geological Congress at Brussels. The council is a member of the International Research Council and all of its affiliated Unions, certain of the council's divisions acting as the American sections of these Unions. The council has recently adhered to the newly established International Union of Pure and Applied Physics. The annual dues to these international scientific organizations are paid by the government through the State Department under authority of a special appropriation item in the diplomatic and consular bill.

The council has taken energetic measures to aid the Australian National Research Council to have a strong delegation of American scientific men at the Second Pan Pacific Scientific Congress which was held under its auspices in Melbourne and Sydney in August and September, 1923.

Dr. Robert A. Millikan, chairman of the division of foreign relations, has been appointed the American representative, succeeding Dr. George E. Hale, resigned, on the League of Nation's Committee on International Intellectual Cooperation.

The division's important committee on Pacific investigations has arranged with the Smithsonian Institution to have made a comprehensive study to be available for use in connection with the renewal and extension of the North Pacific Fur Seal Treaty which expires in 1926. This committee has also assisted in supporting a special expedition of the U. S. Bureau of Biological Survey to the Hawaiian Bird Islands. The Navy Department, the American Museum of Natural History and the Bishop Museum of Honolulu are also cooperating in this expedition.

Division of Federal Relations.—The council's division of federal relations has cooperated with the division of states relations in arranging to have made an important study on the cooperation of the federal government in scientific work with states, municipalities and individuals by Dr. E. W. Allen, chief, Office of Experiment Stations. This report which has been published (December, 1922) as No. 26 in the council's bulletin series discloses a total of more than five hundred separate projects in which the government is a partner with state and local agencies in cooperative scientific work. The funds involved in this cooperative work amount to at least fifty million dollars a year. This estimate does not include contribution in kind, such as land, office or laboratory quarters, special facilities, labor materials, etc., in many of the projects.

Division of States Relations.—The council's division of states relations has interested itself in having studies made by competent men of the present status of state activity in scientific research as assigned to and undertaken by the various state boards of agriculture and horticulture, geology and mining, game and fisheries, natural history, etc. Such studies have

been completed and published for California and Illinois, and other studies are planned for Massachusetts and Maryland.

The division has announced as special subject for its attention during the coming year the effect of the present tendency in the government of certain states toward the centralization of administration and particularly the effect of increased financial and commercial control in the progress of scientific matters established under state auspices.

Division of Educational Relations.—The council's division of educational relations, which has for special interest the relations of higher education and general educational methods to research and the training of research workers, has been engaged in making a survey of the research situation in the colleges and universities of the country. This work has been carried on by questionnaires, correspondence and most importantly and effectively by visits to the educational institutions by representatives of the council. Over 200 colleges and universities have been thus visited.

During the past year the division has given a special attention to the important matter of the methods in vogue—and the absence of such methods—in the colleges and universities of the country for the discovery, encouragement and special training of students of superior capacity from among whom alone the future research workers of the country are to be recruited. In connection with this study of "the problem of the gifted student" the division has had a series of special visits made to a total of about 100 institutions by men especially interested in and informed with regard to this problem, and has prepared and distributed to presidents, deans, professors and graduate and upper-class undergraduate students a series of reports and bulletins which have attracted much attention and been, apparently, gratefully received by the colleges and universities. Among these bulletins is the series of career bulletins for distribution to advanced students which are referred to elsewhere in this report under "Publications."

The division has been enabled to carry on its work of survey and stimulation by means of a special appropriation made by the General Education Board.

VERNON KELLOGG
Permanent Secretary

(To be continued)

COLLECTING PERIPATUS IN NEW ZEALAND

EVER since I have read anything about entomology and of the forms of life related to the Hexapoda, I have had a desire to see and to study under natural conditions Peripatus, one of the most primitive of the group to which the insects belong. Since this lowly arthropod does not occur in North America and is more or less circumscribed in its distribution, being confined largely to the South American, West Indian, African and Australasian regions, not many scientists in the United States have the privilege of observing the animal alive. Indeed, I feel sure that a considerable number of entomologists have never seen even a preserved one.

Therefore, it was with a good deal of satisfaction to myself that, as a participant in the South Sea expedition from the University of Iowa in the summer of 1922, I was able, in New Zealand, to do one of the things which I set out to accomplish, namely, to see and collect specimens of this unique and interesting animal as well as to bring back for our collections a goodly supply of examples. Incidentally, the privilege and opportunity thus offered represents one of the reasons for which such expeditions are organized at this institution.

The Dominion of New Zealand, comprising about 105,000 square miles, lies between 34° and 47° south latitude and 174° and 178° east longitude. Its topography is rough, and the soil, largely of volcanic origin, supports a fairly luxuriant and, in many ways, peculiar native vegetation. North Island, the scene of the hereindescribed activities, possesses a bright breezy climate, the mean annual temperature being about 55° Fahr. and the precipitation averaging a little more than 50 inches.

The native forests, many of which have been much depleted of late, consist largely of totari, tawa, remu, matai and beech; they are always green but the introduced trees all lose their leaves during the winter season (our summer).

About one and one half miles northwest of the city of Wellington and seven hundred feet above the sea there remains a remnant of one of these forests some fifty acres in area which is being maintained by the government as a reserve. In Wilton's Bush, as it is called, a considerable tract remains untouched by the forester's ax. Deep valleys, dense, hilly woods and a fine stream lend attractiveness and beauty to the place. The spiny bush lawyer (*Rubus* sp.) is plentiful and affords good beating for insects in the winter season. On the partly cleared hillsides the green, prickly gorse grows abundantly and, with its bright yellow flowers, adds a touch of color to the scene. Here, in the wooded portion of the bush within the damp and much decayed remu stumps and in the moldering down-timber of the cleared areas Peripatus abounds in some numbers.

In company with Mr. Harold Hamilton, of the Dominion Museum, a visit was made to this place on August 3 and again on August 7 for the purpose of securing specimens of this unique arthropod. Armed with sharp, heavy metal instruments the moist, de-