A HISTORY OF THE NATIONAL RESEARCH COUNCIL 1919—1933

VII. DIVISION OF BIOLOGY AND AGRICULTURE[1]

By Professor FERNANDUS PAYNE
CHAIRMAN

THE Division of Biology and Agriculture was organized on a peace-time basis in 1919, having been preceded by an Agricultural Committee established in 1917. While certain definite objectives were formulated in the beginning, the division has not hesitated to deviate from them or to formulate new ones whenever conditions demanded change.

There was one very definite principle which the division adopted early in its existence from which it has not deviated, and that was that the division should not be an operating organization. By this is meant that projects were to be started, fostered for a time, and then expected to become entirely or for the most part independent. This principle was essential, for if the division had continued to carry all its projects congestion would have resulted and there would have been no opportunity for initiation of new ones.

In any consideration of the work of the division, it should be kept in mind that the several biological societies and, in final analysis, the individual biologists with memberships in these societies, constitute the division. While the work of the division has been carried out by a small group of biologists, they were nothing more than the representatives of the larger group, from whom most of the suggestions for the work of the division have come. The immediate responsibility for the conduct of the affairs of the division has been vested in the chairmanship, which has been filled by the following persons:

1918– —Vernon Kellogg
1919–1921—C. E. McClung
1921–1922—L. R. Jones
1922–1923—F. R. Lillie
1923–1924—R. A. Harper
1924–1925—Maynard M. Metcalf
1925–1926—B. M. Duggar
1926–1927—L. J. Cole
1927–1928—William Crocker
1928–1929—Lorande L. Woodruff
1929–1930—C. E. Allen
1930–1931—W. C. Curtis
1931–1932—Duncan S. Johnson
1932–1933—Fernandus Payne

In the brief presentation which follows only a small part of the work of the division can be given, but this may suffice to give some conception of the many activities in which it has engaged.

The division initiated the National Research Fellowships in the Biological Sciences in 1923, in collaboration with the Division of Anthropology and Psychology. These fellowships are competitive and are awarded by a representative board of fifteen members. During the ten years of its existence a total of 184 appointments (exclusive of anthropology and psychology) have been made. Of these, 47 are serving now. To estimate with any great degree of accuracy the good accomplished by these fellowships is impossible, for many of the values are hidden and they will extend throughout the lifetime of the fellows. It is significant that these fellowships are given for the development of the individual rather than for the completion of a given piece of research, although much valuable research is actually done during their terms of service, as is attested by the number and quality of the papers published.

In addition to the National Research Council Fellowships in Biological Sciences, the division has administered special fellowships. For example: thirteen National Live Stock and Meat Board fellows have been appointed for the investigation of the place of meat in the human diet; eight Sulphur fellows have been appointed for the study of the use of sulphur in the control of plant diseases and insects, and in the improvement of soils for various plant crops; two Seed Germination fellows have been given opportunity to study germination requirements of flower seeds and methods of storage for flower and vegetable seeds. The special Rosenwald Fellowship has also been administered by this division.

By means of grants-in-aid, varying from $70 to $1,500, the division has encouraged 76 different research projects within a four-year period. As in the case of the fellowships, an exact evaluation of the good done is impossible, but the number of mistakes in award has been small, and the quality as well as the volume of the research aided has proven very gratifying.

One of the most comprehensive and significant accomplishments for the aid of research in biology has been the establishment of *Biological Abstracts* in 1926, a task undertaken by the division in cooperation with the Union of American Biological Societies. While perhaps not fully covering all fields at present, the

[1] This is the seventh of a series of ten articles prepared to describe briefly the nature of the activities with which the National Research Council has been engaged during the past fourteen years.

Abstracts present annually a résumé of 30,000 biological contributions.

Before the world war, American biologists were almost wholly dependent upon Germany for biological stains. During the war and immediately afterward, American products were of varying quality. To aid in the improvement and standardization of stains, a joint committee with the Division of Medical Sciences of the Council was first formed; and later an independent commission, which is still functioning, took over the work. This commission has contributed much to strengthening the scientific resources of the United States by encouraging the manufacture in this country of biological stains of high grade and reliable quality. The commission has published a handbook, entitled "Biological Stains" (second edition), and the quarterly *Journal of Stain Technology*.

The division does much of its work through committees, some of which serve for a brief time, while others serve for longer periods. In some cases these committees are formed to initiate and carry through definite pieces of work; in others they may pass from one phase of the subject to another, thus acting as permanent committees. As an example of the first type, the committee on the Marine Biological Laboratory may be mentioned. This committee was formed for the specific purpose of helping to secure funds to place the laboratory on a better and more secure basis. The laboratory has now adequate accommodations for a large number of biologists who may wish to utilize its facilities, and the library is rapidly being developed into one of the best in the country. The results on biological research are incalculable.

The Committee on Effects of Radiation on Living Organisms has succeeded in obtaining a considerable sum of money for a study of the effects of radiation on living organisms. By means of grants to individual investigators, more than 48 researches in this field have been aided, and the committee is still active. Grants have also been made to the Biological Laboratories at Woods Hole and at Cold Spring Harbor. To date, 61 papers have been published as a direct result of these grants. Since the committee has been in operation only four years, the number of papers gives an inadequate conception of the amount of work done. Results will continue to appear over a period of several years. In addition to administering the program of special grants, the committee is making a comprehensive survey of the problems of research in the fields of radiation of light, x-rays and radium emanations, both on animal and plant tissues. This survey is considering especially the application of research in radiation to problems of genetics, general physiology, embryology, growth and development, photosynthesis, photo-periodism and motor response.

From its beginning, the division has been interested in research in tropical America, particularly the agricultural and phytopathological phases, and several committees have worked toward these ends. The Tropical Plant Research Foundation was an outgrowth of the Committee on Phytopathology in the Tropics, and it was formed to promote, in general, research on the plants and crops in the tropics. The principal research project of the foundation was an investigation of sugar cane production problems in Cuba, in which work it centered its attention mainly on four outstanding problems, namely, the mosaic disease of sugar cane, the root diseases of cane, the moth stalk borer of cane, and cane varieties. An experiment station for sugar cane was established in Cuba and branch stations were maintained for variety testing and propagation. The foundation also conducted studies upon the forestry problems of Cuba and tropical America, and the chicle investigations of Central America. In addition an office was maintained in Washington for general information on problems of tropical America.

The Institute for Research in Tropical America, established by the National Research Council, has sponsored the establishment of the Barro Colorado Island Laboratory in the Canal Zone. The laboratory is a tropical station well located with respect to accessibility and opportunities for biological research in the tropics, and with adequate facilities for a limited number of workers. It has become a station of importance for tropical research.

The Committee on Forestry has been actively interested in methods for the reforestation of cut-over lands, improved methods of silviculture, and statistics on silviculture and forest resources of the world. As a result of their investigations, two volumes have been published on "The Forest Resources of the World" and another on the "Volume, Yield, and Stand Tables for Second Growth Southern Pines." A bibliography of North American forestry is now ready for publication.

An example of a direct cooperation with industry is found in the Advisory Committee of the American Institute of Baking, which helped in the selection and solution of some of the scientific problems which confronted the baking industry.

If space permitted, it would be desirable to discuss in detail the work of the Committee on Food and Nutrition organized in 1919 and engaged in the study of the relationship between fertility and nutrition, growth curves in animals, meat and milk in the food supply, and many other important topics; the work of the Committee on Atmosphere and Man, concerning the effects of atmospheric conditions upon mortality, and particularly upon influenza mortality, and the effects of factory conditions upon mortality; the

activities of the joint Committee of this Division with the Division of Medical Sciences of the Council on Microbiology of the Soil established in 1929, which has for one of its several purposes the study of the fate of certain pathogenic organisms in the soil, particularly the tubercle bacillus; the Committee on Infectious Abortion organized in 1922 and operating jointly with the Division of Medical Sciences in the study of the diagnosis, immunology and chemistry of the organisms of this pernicious disease, and the classification of a collection of 700 strains; and the Committee on Pharmacognosy and Pharmaceutical Botany, which has been preparing a map of the geographical distribution of drug plants in the United States. The Committees on Human Heredity, on Animal Breeding, on Family Records, on Tropical Research, on Marine Piling Investigations, on Forestry, on Botanical Nomenclature, on Agriculture, can only be mentioned. A new Committee on Wild Life was organized in 1931 for the purpose of investigating problems relating to the conservation of wild life. It has been proposed to make surveys of wild life, to establish fellowships and grants-in-aid of wild life research, and to prepare a report on the wild life situation.

In many cases where financial help was not needed, or where it could not be given, the division and the Council have given their endorsement, thus lending their moral support. Examples of this sort are found in the experimental program of the Brooklyn Botanic Garden, and the Biological Laboratories at Cold Spring Harbor, Mount Desert Island, (Gothic, Colorado) and the Glacier Bay National Park. Many other projects have been aided in their initial stages by means of small grants.

The problems of research publications in biology are not for a single editor to solve. Instead, they need the concerted efforts of all editors, and even of the individual biologists who write the papers. The problems of aquiculture are many and complex, involving the fields of zoology, botany, chemistry, physics and geology. Hence, for their solution they need the cooperative efforts of men from these different fields of interest. In these and other cases, groups of workers with similar or kindred interests may meet to plan and outline specific projects, and to consider ways and means of carrying out a given piece of work. They may also meet to discuss, clarify and focus attention upon the more fundamental problems in a given field. The division has fostered many such conferences, and much of its work has been initiated in this way.

Finally, it may be said that now, more than ever, the division needs the active support and cooperation of every biologist, if it is to continue to carry on its work effectively; and it is hoped that this brief sketch will aid them in visualizing more fully its potentialities.

SCIENTIFIC EVENTS

THE AMERICAN STANDARDS ASSOCIATION AND THE BUREAU OF STANDARDS

THE following activities of the National Bureau of Standards are to be transferred to the American Standards Association, a federation of thirty-seven national technical societies, trade associations and governmental bodies, with headquarters in the Engineering Societies Building, New York City, as the result of an arrangement worked out between Secretary of Commerce Daniel C. Roper and President Howard Coonley, of the American Standards Association:

Division of Trade Standards
Division of Specifications
Division of Simplified Practise
Building Code and Plumbing Code Sections of the Building and Housing Division
Safety Code Section

In making arrangements for the transfer, Secretary Roper wrote to Mr. Coonley in part as follows:

The Bureau of Standards is discontinuing most of the work which it has been carrying on in the field of simplification, commercial standards, safety codes and building codes. This step, undertaken in the belief that these functions should be in the hands of industry and consumer groups, is being carried out as a part of the government economy program.

I am pleased that we shall be able to count on the American Standards Association to carry on the essentials of this work, which, as a result of our discussions, I now understand the association will be prepared to do. Its experience and standing as the national clearing house for industrial standardization, and the cooperative methods which it has developed during the past fifteen years fit it for the increased responsibilities and the enlarged program entailed.

Mr. Coonley in reply writes:

You are probably aware that the American Standards Association, as a federation of trade associations, technical societies and governmental departments, depends for financial support on the voluntary membership dues of associations and companies. Our most pressing immediate task, if we are to continue the new work effectively, is to obtain a substantial increase in our financial support. I can assure you that every effort will be made to accomplish this end. And since the department's