

Special Committee on Fertilizers.—The following members have been appointed on this Committee and a plan for publicity work to educate the people on the subject has been formulated:

A. F. Woods, Chairman, E. W. Allen, F. J. Alway, S. Avery, K. F. Kellerman, W. G. Lipman, B. E. Livingston.

Moved: That the Special Committee on Fertilizers be allotted the sum of \$1,000 or such part thereof as may be necessary to meet the general expenses of that Committee, from the allotment for the Division of Agriculture. *(Adopted.)*

Moved: That the Special Committee to undertake a determination of Physiological Salt Requirements of certain Cultivated Plants be allotted an appropriation of \$2250 or such part thereof as may be necessary for the general expenses of that Committee, from the allotment of the Division of Agriculture. *(Adopted.)*

Moved: That the Special Committee on Problems of Protein Metabolism in Animal Feeding be allotted \$500 for current expenses from the allotment of the Division of Agriculture. *(Adopted.)*

Mr. Woodward *Moved:* That the above acts of the Interim Committee be approved, ratified and confirmed. *(Adopted.)*

The Board adjourned at 12.45 a.m.

PAUL BROCKETT, *Assistant Secretary.*

MINUTES OF THE MEETING OF THE EXECUTIVE BOARD

AT THE NATIONAL RESEARCH COUNCIL BUILDING, AUGUST 13, 1918, AT 9.35 A.M.

Present: Messrs. Dunn, Mendenhall, Merriam, Noyes, Southard, Washburn, Welch, Woods, Woodward, and Yerkes.

The Acting Chairman reviewed the work of the Research Council since the last meeting; a general statement of the activities of some of the Divisions is appended.

The holding of a joint meeting of the Executive Board with the Council of the National Academy on Monday, September 9, to consider matters to be presented to the conference of Academies in London on October 9, was approved.

Committee on Reconstruction Problems.—Mr. Merriam presented a report from the special committee brought together to consider plans for reconstruction work after the war.

Moved: That the following recommendations of the Committee be approved:

That a committee be constituted on Reconstruction Problems, to be appointed by the Acting Chairman.

That this committee be empowered to increase its membership by associating with itself experts in each line investigated and to cooperate with other organizations engaged in reconstruction work.

That an appropriation of \$5,000 be made to cover necessary clerical and traveling expenses, procuring of documents, and reports, provided funds are available.

That the committee be instructed to map out the whole field of reconstruction, and ascertain what agencies are now working in each portion of the field.

That the committee make plans for research into important reconstruction problems, within the scope of the activities of the National Research Council not now being covered and to indicate the agencies which should undertake this work. (Adopted.)

The Chairman read the following letter of July 25, 1918, from Ralph Barton Perry, Executive Secretary of the Committee on Education and Special Training of the War Department to the Acting Chairman, Mr. Noyes:

I beg to submit the following vote passed at a meeting of the Executive Committee on College Training, held Tuesday, July 23, 1918:

"Voted to invite the National Research Council to form a committee for the purpose of reviewing cases of research men who may be candidates for the Enlisted Reserve Corps."

Moved: That the Chairman of the National Research Council be authorized to appoint a committee of five, of which the Chairman shall be a member, to recommend to the Committee on Education and Special Training men of draft age engaged in research of such importance that it seems desirable to have them assigned to scientific work rather than to purely military service. (Adopted.)

The Chairman appointed the following committee: J. C. Merriam, Chairman, R. A. Millikan, R. M. Pearce, Vernon Kellogg, A. A. Noyes.

Section on Relations with Educational Institutions and State Committees:—

Resolved: That the administration of the Section on Relations with Educational Institutions and State Committees be extended by arranging the work for the United States so that it will be related to four districts representing approximately the North Atlantic, Southern, North Central, and Pacific Coast-Rocky Mountain regions, and that under the direction of this Section a representative resident in each of these regions be appointed to confer with Chairmen of local committees, to promote the interests of research, and to care for the relations between the Research Council and the local committees. (Adopted.)

Division of Chemistry and Chemical Technology.—At the preceding meeting of the Executive Board the matter of the discontinuance of the Committee on Gases Used in Warfare was taken up, but it was decided to defer definite action until a recommendation from Mr. Van H. Manning, Chairman of the Committee, should be received. Mr. Manning wrote recommending that this Committee be discontinued, and it was

Moved: That in accordance with the recommendation of Mr. Manning, the Committee on Gases Used in Warfare be dissolved. (Adopted.)

The meeting adjourned at 11.45 a.m.

PAUL BROCKETT, *Assistant Secretary.*

General statements as to the recent activities of some of the Divisions are appended.

Division of General Relations.—*Section on Relations with Educational Institutions and State Committees.* The Section has secured and transmitted reports to the War Department Committee on Education and Special Training, on the

matter of instruction in scientific subjects with a view to making a recommendation as to the best organization of courses to meet emergency needs. These reports have been discussed with the members of the above Committee and they will be transmitted to the educational institutions with the recommendations of this Committee relating to the organization of instruction for the coming year. The Division of Geology and Geography is working on the preparation of a text book and syllabus to follow the report transmitted and it will probably be desirable for other Divisions of the Council to prepare similar detailed reports on instruction for emergency work.

The Section has been receiving information from the research committees in educational institutions and now has sufficient data to enable it to prepare a preliminary report on the present state of emergency research in the universities and colleges of the country. It has also kept in close touch with the American Emergency Council on Education which is doing important work in bringing together the educational institutions of the country. Of special importance at the present time is the organization of a group of prominent educators to consider the reconstruction policy of this country, a question which involves the matter of research in educational institutions.

Division of Engineering.—Section on Mechanical Engineering. This Section has taken possession of the machine shop and laboratory of the Carnegie Institute of Technology at Pittsburgh for its work. It has about seven men now at work there and expects to increase their number to twenty or thirty very soon. The Section is preparing to develop several new types of light engines, and to experiment on the more efficient use of gaseous fuel.

Section on Metallurgy. This Section is arranging for the manufacture and ballistic testing of lots of several hundred each of helmets made from five types of steel, which in the preliminary tests have given the greatest promise. It has made encouraging tests with some new types of gun. In coöperation with the Bureau of Standards, Bureau of Mines and the Geophysical Laboratory it is making investigations looking towards the economy of manganese in ore-smelting and in steel-making, with the purpose of releasing vessels now used in bringing manganese ore from abroad. It is arranging to coöperate with the Production Division of the Ordnance Department in standardizing the manufacture of fire-arms. In connection with the Section of Electrical Engineering and the Emergency Fleet Corporation it is seeking to improve the electric welding of ships.

Division of Chemistry and Chemical Technology.—Changes in the Executive Committee of the Division. Since the last report of the Division the following changes have occurred in the Executive Committee: Dr. Samuel Avery has resigned as Vice-Chairman and Dr. E. W. Washburn has been appointed to fill the vacancy. At the direction of Colonel Bogert, Majors Avery and Rogers of the Chemical Warfare Service have been assigned to represent this service at the meetings of the Executive Committee. Owing to the resignation of Pro-

fessor S. A. Tucker from the War Industries Board a vacancy has been created in the Executive Committee of the Division which has not yet been filled.

Activities of the Sub-Committees. The following sub-committees of the Division have been especially active: (1) The Committee on Synthetic Drugs; (2) The Committee on Ceramic Chemistry; (3) The Committee on Glue and Other Colloids.

The Committee on Synthetic Drugs has been in close coöperation with the Federal Trade Commission, has initiated several investigations dealing with the manufacture of special drugs, and has arranged to have a number of these drugs recently unobtainable manufactured by American firms.

The Committee on Ceramic Chemistry is engaged in the preparation of two manuscripts dealing respectively with (a) the formation of an organization for coöperative research in the subject of refractory materials, and (b) the formation of a similar organization for the investigation of the washing, blending, and preparation of clays. Under the auspices of this committee a conference was held in Pittsburgh in June, and an organization formed for undertaking a coöperative survey of the ceramic raw materials of the country. This coöperative survey has been inaugurated and is being carried out under the direction of the American Association of State Geologists.

The Committee on Glue and Other Colloids has taken up the question of the standardization of Government specifications for glue.

The Sub-Committee on the Chemistry of Soils and Fertilizers has been discharged and a new fertilizer committee organized under the Division of Agriculture, but with representatives from both divisions, has been constituted with the following personnel: Messrs. Allen, Alway, Avery, Kellerman, Lippman, Livingston, and Woods, Chairman.

University Research on War Problems. The work of collecting and assigning war problems to university laboratories for investigation is proceeding satisfactorily. The Vice-Chairman has established relations with the Chemical Warfare Service, the Surgeon General's Department, the War Industries' Board, the Nitrate Committee, the Explosives Committee, and the United States Signal Corps, for the purpose of securing such problems. Thus far, 25 problems have been formulated and 11 have been assigned.

The Training of Chemists for Government Service. At the request of the War Department's Committee on Education and Special Training the Vice-Chairman has undertaken to collect data concerning the numbers of chemists required for Government service, together with data concerning any special training which such chemists should have to fit them for Government work. On the basis of these data recommendations concerning any desirable modifications in or additions to collegiate courses in chemistry will be formulated and transmitted to the colleges and universities.

International Cooperation in the Publication of Chemical Abstracts. On the initiative of the Division a conference was held recently in Washington and plans were formulated for the presentation to the English Chemical Societies

of a scheme for international coöperation in the collection and publication of chemical abstracts.

Division of Geology and Geography.—The work of the Committee on Geologic Service in the field of military operations has been completed. The Secretary of War reports that the geologic service will be included in the work of the Engineer Corps, and General Black, Chief of Engineers, states that the Corps is taking up geologic work both in the United States and abroad. Appreciative reference is made to the work of our Division which seems to have served a good purpose. At the present time the geologic service of the Central Powers is greatly superior to that of America and our Allies and is very effectively employed; but there is no doubt that we shall soon surpass the German army in this field of endeavor.

The committee on suggestions as to inclusion of materials from geography and geology in the training courses for officers and men, after a carefully conducted examination of the field, has made its report to the War Department. This report is very favorably received and will be acted upon in the near future. Much credit for this work is due Dr. C. P. Berkey.

The committee on preparation of recommendations on the best organization of instruction in geology and geography has reported and this statement is in the hands of the Committee on Education and Special Training.

Division of Agriculture, Botany, Forestry, Zoology and Fisheries.—In the Agriculture Committee special consideration has been given the problem of fertilizers. This Committee has cooperated with the Fertilizer Committee of the Division of Chemistry. In accordance with the joint recommendation of the two Divisions, the fertilizer work has now been consolidated under the Committee on Agriculture with a Special Committee made up of representatives of the two Divisions. Plans are being formulated to bring about coöperation in some of the larger fertilizer questions facing the country. Representatives of the State Colleges of Montana, North and South Dakota, Minnesota, Wisconsin, Iowa, Nebraska and Kansas were asked to form a special organization coöperating with the National Research Council for the purpose of collaborating in the study of the fertilizer problems of that area with special reference to the most economical use of the large deposits of phosphate rock in Montana in connection with the utilization of the large quantities of sulphuric acid that will be available following the war. It is planned also to study the possible utilization of ammonia compounds which will be available as by-products of war industries. It is planned to develop similar coöperative organizations in the study of other fertilizer problems. A special sub-committee has been organized for certain research work in connection with potash substitutes.

A special Committee on Fibers is making a study of the fibers available for binder twine.

The work in Animal Nutrition is being continued in accordance with the project already approved. Plans for a conference of the collaborators of this project have been formulated and the Committee will meet for a special conference early this fall. The work is proceeding satisfactorily.

The Committee on Zoology has been cooperating with the Department of Agriculture in calling attention to the methods of destroying rats and mice to prevent their depredations on stored food products. Through the Council of National Defense an urgent appeal is being sent to all State Councils to utilize the valuable methods recommended by the Department of Agriculture to fight this pest.

The Division is cooperating with the Division of Geology and Geography in gathering information from various colleges in the country as to modifications of courses of instruction to meet war conditions.

MINUTES OF JOINT MEETING OF THE EXECUTIVE BOARD AND THE
COUNCIL OF THE NATIONAL ACADEMY OF SCIENCES

AT THE NATIONAL RESEARCH COUNCIL BUILDING, SEPTEMBER 9, 1918 AT 9.50 A.M.

Present: Messrs. Abbott, Dunn, Gregory, Hale, Howe, Johnston, Kellogg, Lester, Manning, Mendenhall, Millikan, Noyes, Pearce, Pupin, Stratton, Yerkes, and by invitation Durand, Flexner, and Gunnell.

The minutes of the preceding meeting, and of the intervening meetings of the Interim Committee, having been circulated by mail, were approved.

In considering the request of Dr. Schuster of the Royal Society as to the utility of the International Catalog of Scientific Literature, Mr. L. C. Gunnell described the present organization of the International Catalog and the difficulties under which it has been operating since the war began.

Mr. Noyes *moved*: That, before continuing the publication of the International Catalog, full consideration be given to the practicability of securing cooperation and avoiding duplication in the whole field, including the preparation of indexes, bibliographies, and abstracts of scientific literature. *(Adopted.)*

Moved: That the Chairman of the Research Council, Mr. Hale, act as a member and Chairman of the Research Information Service. *(Adopted.)*

Moved: That in the absence of the Chairman, Mr. Noyes, Mr. Merriam act as Chairman of the Division of General Relations and Mr. Johnston as Chairman of the Committee on Nitrate Investigations. *(Adopted.)*

Moved: That a Budget Committee of three be appointed by the Chairman to take charge of the accounts of the National Research Council. *(Adopted.)*

The Chairman appointed the following Committee: John Johnston, Chairman, Whitman Cross, R. S. Woodward.

Mr. Hale *moved*: That a small local committee on submarine research work be appointed in California, with headquarters at Pasadena, with Professor Harris J. Ryan, of Stanford University, as Chairman. *(Adopted.)*

The Chairman, Mr. Hale, asked for a discussion of the plans suggested for consideration by the Inter-Allied Conference, to be held in London on October