

firmed. Dr. Aleš Hrdlička was elected as vice-president of Section H.

On motion, the sum of four thousand (4,000) dollars was appropriated to the committee on grants, with the suggestion that the committee use this amount with especial care. On motion, the treasurer was authorized to invest spare funds in government Liberty Bonds, the amount reported by him being in the neighborhood of one thousand (1,000) dollars.

After extended discussion as to the time and place of the next meeting, in which letters from President Lowell, of Harvard, and President MacLaurin, of the Massachusetts Institute of Technology, were read, and in which the permanent secretary reported the result of his visit to Boston to consult with leading Boston members, it was resolved that the place of the next meeting be changed from Boston to Baltimore, provided satisfactory arrangements can be made with the authorities of Johns Hopkins University.

On motion, it was resolved that a subcommittee be appointed to consult and report on a general plan for the next meeting. The permanent secretary and Messrs. Humphreys and J. C. Merriam were appointed as members of this committee, with authority to consult with other individuals and to add to the committee if found desirable.

A letter from Dr. S. A. Curtis was read relative to the Emergency Council of Education and the permanent secretary was authorized to ask Dr. E. F. Buchner to represent the Association at the next meeting of that organization.

The requests of the Seismological Society of America and the Optical Society of America for admission to affiliation were acted upon favorably and it was resolved that non-members of these societies be admitted to the Association during this year without the payment of the entrance fee.

On motion, it was resolved that the New Orleans Academy of Sciences be admitted to affiliation with the association or, if the Academy prefers, the permanent secretary was authorized to arrange for its establishment as a local branch of the association.

On motion, the permanent secretary was authorized to accept for the association "organization membership" in the American Metric Association and to pay the \$10 fee for the association.

After some discussion, the permanent secretary was authorized to have the composition of the responsible editorial committee of the journal *SCIENCE* completed by the substitution of the newly elected vice-presidents for those of last year and to add the name of Henry B. Ward to the representatives of Section K, and the permanent secretary was authorized to have this list manifolded to send to members who request information concerning the composition of the committee.

On motion, the committee resolved that the committee on grants consist of nine (9) members to be elected by the council at the next annual meeting: three for one year, three for a term of two years, and three for a term of three years; thereafter, three members to be elected annually for those whose terms expire, with the proviso that not all of the three shall be reelected, and that the council shall designate the chairman and the secretary of the committee.

At 9.15 P.M., the committee adjourned, to meet at the call of the chairman, with the understanding that it may be desirable to hold the next meeting during the third week of November at Baltimore in case emergency does not demand an earlier meeting.

L. O. HOWARD,
Secretary

SECTION M—AGRICULTURE

THIS Section held two sessions at the Pittsburgh meeting, in Thaw Hall, University of Pittsburgh, one on the afternoon of December 28 and the other on the morning of December 29, 1917. At the latter session the address of the retiring Vice-president of the Section, Dr. W. H. Jordan, was presented, the subject being "The Future of Agricultural Education and Research in the United States."¹

The feature of the session on the afternoon of December 28 was a symposium on "Factors Concerned in an Increased Agricultural Production."

¹ *SCIENCE*, N. S., Vol. XLVII., p. 125.

Considering the subject from the standpoint of "The present status of production," Dr. John Lee Coulter, of West Virginia, reported that of the total land area of continental United States, 1,900,000,000 acres, approximately 900,000,000 acres, or less than half, is in farms. Of the latter only about half is improved land, much of the balance not even being used for pasturage. Of the improved land, about 90,000,000 acres is used for pasturage, some 20,000,000 acres around buildings is not productively employed, and another 40,000,000 acres annually lie fallow; *i. e.*, some 150,000,000 acres are not employed to their limit.

Improvement, he felt, should begin with these areas, and he did not favor at this time expansion into new areas requiring heavy expense and labor for development through drainage, irrigation, removal of stumps and stones, etc. There was ample opportunity for all the necessary and possible increase within the limits of farms already in active operation. In an emergency like the present, state and national governments should encourage concentration of effort, especially labor, in the more productive agricultural areas, in order that the largest amount of farm products may result. The drainage of improved farm lands was advocated as one of the effective means of making efforts more productive, and also liming to sweeten the soil on millions of farms. It was advocated that during the war the government "devote all funds which can be intelligently expended in the promotion of agriculture on farms already in active use. This will include help in the matter of drainage, lime, fertilizers, seed, machinery and, above all, agricultural labor."

Referring to the effects of the tenant system, it was argued that more studious care on the part of the land owners through supervision could do more toward increasing production than most any other means.

The "Obstacles to enlarged production" were set forth succinctly by Professor W. D. Hurd, of Massachusetts. These cover a wide range and their enumeration showed the great extent to which the producers of the country are required to cope with difficulties, some of which inhere in the status of the industry and many of which are outside of human control.

Conspicuous among the obstacles to enlarged production are the systems of management which farmers are following, unwise and inefficient marketing, the enormous losses from plant diseases and insects and other pests such as rodents in the fields and storage buildings, the ravages of animal

diseases, and the lack of adequate supply of farm machinery and equipment. The inadequacy of good farm labor, which has become very acute in many sections, was instanced as one of the chief obstacles at the present time. The possible means of relieving this situation and the efforts which the state and federal governments and other agencies are making in that direction, were detailed.

Other obstacles were noted which have arisen out of war conditions, such as the shortage of seed of various kinds, the lack of fertilizers in sufficient quantity, the shortage and high price of feeding stuffs, transportation difficulties, etc. Again, lack of necessary working capital and the absence of efficient organization among farmers to meet the organized forces with which they have to contend in their outside dealings, are elements of weakness which tend to restrict production and to make an increase more difficult.

Among uncontrollable factors are those of climate and season, the effects of which were cited, for example, in the large percentage of soft corn the past year, and the reduction in the area of winter wheat which it was possible to sow or bring through the past winter.

Professor Hurd gave many interesting illustrations of what is being done to overcome many of the difficulties under which farmers are laboring and to aid them in meeting such as can not be eliminated or reduced. This made a remarkable showing of organized effort for relief and assistance, extending over the whole range of the agricultural industry, from which much was predicted in increasing the output of the nation's agriculture.

In discussing "The limiting factors in production" Director Charles E. Thorne, of Ohio, pointed out that increased production must be accomplished either through increase of area or by increased yield per acre. Increase in area involves a corresponding increase of capital and labor and is limited by the land which may be profitably added. The latter limit, it was felt, has been nearly or quite reached. The chief limiting factors in crop production were stated as (1) inadequate drainage of lands in cultivation, against which two obstacles have been removed, by providing capital through the farm loan banks and machinery to simplify the labor problem; (2) deficiency of lime in many soils, the remedy for which is associated with problems of labor and transportation; (3) neglect of crop rotation, which both scientific research and actual farm practice have demonstrated to be necessary in growing cereals economically;

(4) phosphorus hunger, a fundamental factor, since "in no other way can the production of wheat be increased as quickly and as effectively as by placing an abundant supply of acid phosphate within the reach of the farmers [east of the Mississippi] at a reasonable price"; (5) insufficient transportation—to meet the needs of drainage, liming, fertilizing and other supplies, as well as the movement of products; and (6) labor deficiency, which limits improvement in all directions.

Despite the development of farm machinery and scientific methods of farming, human labor is indispensable, and "each improvement in machinery or in method has made it more and more necessary that that labor be something more than mere brawn." Even common labor unskilled in farm work, it was pointed out, is not to be had at wages which the prices of farm products justify. It was maintained that the increased production of food is dependent chiefly upon such coordination of wages and prices of farm produce that the cost of the increased production may not be greater than its market value, and upon such coordination of transportation activities that the farmer may obtain the tile, lime and fertilizers essential to an enlarged production. The thesis was laid down that "in the present emergency the production of food is not less important to the nation's life than the production of munitions or carrying the rifle," and further that, "if food production is to be maintained the prices of farm products must be such as to permit the payment of wages corresponding to those paid in the production of munitions." To meet the necessities of war, the speaker went so far as to advocate selective conscription of labor for the production, manufacture and transportation of food and munitions, contending that selective conscription for the necessary support of the military service is equally defensible with selective conscription for military service.

In considering the subject from the broad standpoint of "The human element," Mr. Herbert Quick, of the Federal Farm Loan Board, developed a strong, logical argument for education suited to the agricultural industry and its environment. Starting with the now recognized fact that the hands are controlled by the mind, and that the mind back of the operation is far more important than the body, he contended that this faculty must be trained and guided to make it effective and to develop in it a proper attitude toward its occupation and environment. Men are bound to their occupations by a variety of elements, and it is not

alone the financial side which makes a calling attractive. Traditional respect binds people to an occupation, as in the case of the professions. Public appreciation of what one is doing is another factor in binding men to their work, and agreeable environment is often another important consideration. But the thing that most of all binds a man to his occupation is that it engrosses all of his powers, that it brings into action every power of his being.

Farmers have been largely deprived of these stimulating influences. They have been looked down upon historically, as is shown, for example, by the origin of many common words in our language. Their art has been based largely on tradition and experience. Their environment has been hard and neglected. And schools have been prescribed for them and books employed which have educated children away from farming and caused them to look to other walks of life for careers which would engross their powers, bring appreciation and position, and return a large measure of satisfaction.

Conditions are now changing. Already the attempt at agricultural teaching has shown its advantage in making the farming occupations more attractive, more gratifying, and a source of pride, and in producing more effective workers. Where the country school is right the children stay in it longer and feel a real pride in it. Where properly developed, it was predicted that it will turn the tide and retain the children in the country. Its position is a fundamental one and it will affect all rural industries and institutions. The permanent basis of increased agricultural production is the development of the farm people and especially the children; and most important of all, for permanent advancement "we need in this country a farm population engaged in a grapple with its own problems." The accomplishment of these ends was placed back on the country school.

The officers of the Section elected for 1918 were as follows: Vice-president, Dr. H. P. Armsby, director of the Institute of Animal Nutrition, State College, Pa.; Member of the General Committee of the Association, Dr. R. A. Pearson, Assistant Secretary of Agriculture; Member of the Council of the Association, Dr. C. E. Marshall, Massachusetts Agricultural College, Amherst, Mass.; Member of the Sectional Committee (for five years), Dr. John Lee Coulter, dean of the college of agriculture, West Virginia University.

E. W. ALLEN,
Secretary