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AGRICULTURAL EDUCATION  
1916-1918

By

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FEDERAL AGENT FOR AGRICULTURAL EDUCATION, FEDERAL  
BOARD FOR VOCATIONAL EDUCATION

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## AGRICULTURAL EDUCATION, 1916-1918

By C. H. LANE,

*Federal Agent for Agricultural Education, Federal Board for Vocational Education.*

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### AGRICULTURE IN SECONDARY SCHOOLS.

In the passage of the Smith-Hughes Act another important step has been taken by the Federal Government in its relations to education. Under the new measure, Federal appropriations ultimately aggregating over \$7,000,000 per annum have been made available for cooperation with the States in the promotion of vocational education in agriculture, the trades and industries, and home economics, including the preparation of teachers. The principle of Federal aid through the States in education in institutions of subcollegiate grade has been established and an additional set of administrative machinery has been devised to operate the new system of education which is provided.

As a pioneer measure, the new legislation inevitably recalls the original Morrill Act. Primarily both laws were apparently intended to provide training in agriculture and the industries, the one in collegiate, the other in subcollegiate institutions. They were thus both designed to develop a type of education of the utmost importance to our country, but previously never directly supported by the Federal Government and to only a limited degree by the States and local communities. Likewise both acts involved the introduction of a new system of education into the existing system.

It is somewhat remarkable that these two measures, separated in time by a period of over half a century, should both have been enacted in a period of great national crisis. The Morrill Act of 1862 was of course signed in the midst of the Civil War, while the vocational education act of 1917 antedated by only a few weeks the formal

entrance of the United States into the present conflict. The coincidence is the more striking since both measures were designed to foster agriculture and the industries, foremost among the arts of peace, and since both had been pending in Congress for years before the outbreak of hostilities.

The measure ultimately adopted was introduced into the Sixty-fourth Congress by Senator Hoke Smith on December 7, 1915, and was passed by the Senate with amendments July 31, 1916. Its early enactment was strongly urged by President Wilson in addressing Congress at its reopening in the following December, as—

of vital importance to the whole country because it concerns a matter too long neglected, upon which the thorough industrial preparation of the country for the critical years of economic development immediately ahead of us in very large measure depends . . . . It contains plans which affect all interests and all parts of the country, and I am sure that there is no legislation now pending before the Congress whose passage the country awaits with more thoughtful approval or greater impatience to see a great and admirable thing set in the way of being done.

As an expression of educational policy, the new act embodies some important departures from previous legislation. It makes provision for the training within the schools of a large group of our population hitherto unreached directly by the Federal Government. On the one hand, by offering instruction along vocational lines and of subcollegiate grade, it supplements the Morrill Act, the expressed purpose of which is to maintain colleges "to teach such branches of learning as are related to agriculture and the mechanic arts . . . in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." On the other hand, since it contemplates a system of training in the schools, it also supplements the agricultural extension act of 1914, in which the service provided is "the giving of instruction and practical demonstrations in agriculture and home economics to persons not attending or resident in State colleges in the several communities." Since it imposes definite requirements as to the training of teachers, it also represents a material extension of authority over the purely permissive provisions of the Nelson amendment of 1907.

The most radical innovation in the act deals with the method of its administration. Previous legislation along these lines has regarded the college of agriculture and mechanic arts as the State unit, whether for college instruction under the Morrill Act and acts supplementary thereto, the preparation of teachers under the Nelson amendment, the conducting of research in agriculture under the Hatch and Adams Acts, or the carrying on in cooperation with the United States Department of Agriculture of extension work in agriculture and home economics under the extension act. The administration of

those measures dealing with college instruction has centered in the Department of the Interior, and of those dealing with research and extension work in agriculture in the Department of Agriculture. The vocational education act in both respects establishes a new administrative system.

As its head there is provided a Federal Board for Vocational Education. This board consists of seven members, including the Secretaries of Agriculture, Commerce, and Labor, and the United States Commissioner of Education, ex officio, with three members appointed by the President and confirmed by the Senate ultimately for terms of three years each. One of the appointed members is a representative of the manufacturing and commercial interests, one of the agricultural interests, and the third of those of labor. The board selects its own chairman each year.

The Federal board is charged with the administration of the act, the details as to the care of funds, the certifying of the States, etc., in general plan resembling the legislation for the agricultural colleges and experiment stations. In addition it is empowered to make, or have made, investigations and reports to aid the States in the establishment of vocational schools and classes, and in giving instruction in agriculture, the trades and industries, commerce and commercial pursuits, and home economics. These studies include agriculture and agricultural processes and the requirement upon agricultural workers, similar studies as regards the trades, industries, and commerce, home management, domestic science, and the study of related foods, and the principles and problems of administration of vocational schools and of courses of study and instruction in vocational subjects. In the discretion of the board, the studies concerning agriculture may be made in cooperation with or through the Department of Agriculture. Similar cooperative arrangements may be made with the Departments of Labor and Commerce for industrial subjects, while the studies of the administration of vocational schools, curricula, and methods of instruction in vocational subjects may be taken up in cooperation with or through the Bureau of Education. An appropriation of \$200,000 per annum, available from the date of passage of the act, is made to the board for its expenses.

To cooperate with the Federal board in carrying out the act, each State when accepting its provisions is to designate a State board of at least three members. The State board of education or some board having charge of the administration of public education or of any kind of vocational education may be designated as the State board, or an entirely new board may be created.

The State board is to prepare plans for the approval of the Federal board, showing the details of the work for which it is expected

to use the appropriations. These plans, it is specified, must show the kinds of vocational education contemplated, the kinds of schools and equipment, courses of study, methods of instruction, and the qualifications and the plans for the training of the teachers and agricultural supervisors. In all cases the work must be conducted under public supervision and control.

The plans of expenditures for salaries in agricultural subjects must in addition show that the controlling purpose of the education is to fit for useful employment, that the training is less than college grade, and that it is designed to meet the needs of persons over 14 years of age who have entered upon or who are preparing to enter upon the work of the farm or of the farm home.

The Federal appropriations to the States are divided into three distinct groups, providing respectively for the payment of salaries of teachers, supervisors, or directors of agricultural subjects; for the payment of salaries of trade, home economics, and industrial subjects; and for the preparing of teachers, supervisors, or directors of agricultural subjects, and of teachers of trade and industrial and home economics subjects.

The main initial appropriation for salaries in agricultural subjects is \$500,000. This is increased by \$250,000 per annum during the next six years and then by \$500,000 per annum during the next two years, making an appropriation of \$3,000,000 for the fiscal year 1926 and annually thereafter.

The main appropriation for preparing teachers and supervisors is likewise \$500,000 for the first year, but increases to \$700,000 and \$900,000, respectively, for the next two years and then becomes \$1,000,000 per annum thereafter. The Federal appropriations for teacher training must be divided among agricultural, trade and industrial, and home economics subjects, no one of these subjects being granted more than 60 nor less than 20 per cent of the State's allotment for that year.

The act embodies a system of Federal and State administration of vocational education which is a compromise between the views of those who thought a separate system of public education should be organized for vocational purposes and those who believed that the unity of our present public-school system should be maintained. Each State is left free to establish a separate system or to make the vocational schools and courses a part of its existing system.

It is probably very fortunate that so much flexibility of organization has been incorporated in this act. This broad measure, which will affect the educational system of our vast country with its great variety of industrial conditions and possibilities, gives an unequalled opportunity for the study and trial of curricula, methods of teaching,

practical work, equipment, etc., adapted to a wide range of vocations and very diverse environments.

The training of the teachers provided for will throw a very heavy burden of responsibility on our higher technical institutions and particularly the land-grant colleges. These institutions have been very successful in training technical experts who have contributed in large measure to the success of our industries. They have not as yet paid any large attention to the training of teachers for secondary schools of the strictly vocational type. The pedagogy of this class of education is yet in its preliminary stages. It evidently will not do simply to copy what has been worked out abroad. There is therefore great incentive for men of original thought and inventive skill to enter this comparatively new field of teacher training.

For purposes of administration and inspection under the Smith-Hughes Act the Federal board has divided the country into five sections or regions. In defining these regions the States are grouped as follows:

I. *North Atlantic*.—Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Delaware, and Maryland. Headquarters in New York City.

II. *Southern*.—Virginia, North Carolina, South Carolina, Georgia, Florida, Tennessee, Mississippi, Alabama, Arkansas, Louisiana, and Texas. Headquarters in Atlanta, Ga.

III. *North Central*.—Michigan, Ohio, West Virginia, Indiana, Kentucky, Wisconsin, Illinois, Minnesota, Iowa, and Missouri. Headquarters in Indianapolis, Ind.

IV. *West Central*.—North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Montana, Wyoming, Colorado, and New Mexico. Headquarters in Kansas City, Mo.

V. *Pacific*.—Idaho, Utah, Arizona, Nevada, Washington, Oregon, and California. Headquarters in San Francisco, Cal.

An agent of the Federal board for the fields of agriculture, trade, and industrial subjects is assigned to each region; the agents for home economics remain in Washington. These Federal agents are, in general, to act as administrative representatives of the Federal board in the field, to gather information regarding methods adopted by the several State boards for the administration of the act, and to inspect the work of the State boards in so far as it has to do with the requirements of the law; with the decisions and policies of the Federal board, and with the approved plans for the States.

Up to January 1, 1918, 48 States have accepted the Smith-Hughes Act either by specific provisions of the legislatures or by act of the governor, and up to January 1, 1918, the plans of 48 States had been examined by the Federal Board for Vocational Education, approved,

and the board had certified to the Secretary of the Treasury that these States were entitled to receive the allotments for the year 1917-18, apportioned by the terms of the act.

Over 500 agricultural schools and classes were approved by State and Federal boards for carrying on the work in agriculture under the provisions of the Smith-Hughes Act.

The chief handicap in the promotion or introduction of vocational agricultural instruction was the lack of qualified teachers. This was due largely to the present war emergency—many of the agricultural teachers being drafted or volunteering for service in the Army.

In practically every State the State board for vocational education has provided a State supervisor of agriculture. In some cases this supervisor is a part of the organization of the State board and in some cases he acts in a dual capacity as head of the teacher-training work under the provisions of the Smith-Hughes Act and State supervisor of agriculture. This arrangement is due largely to a lack of funds on the part of the State boards for carrying on supervisory work.

In every State but one the State board for vocational education has designated the land-grant college as a teacher-training institution in agriculture. As a result of their designation as teacher-training institutions under the provisions of the Smith-Hughes Act, they have organized departments of agricultural education and are proceeding along very definite lines to train vocational teachers of agriculture.

#### THE ELEMENTARY SCHOOLS.

There has been continued effort on the part of many agencies to promote the various phases of elementary agriculture in the common schools.

*Minnesota.*—The work in agriculture in the rural schools has practically all been in the form of boys' and girls' club work. The majority of county superintendents have acted as county club leaders directing the work. The work has been taken up along 10 lines of home projects—corn, potato, pig, calf, garden, canning, poultry, cow feeding, bread making, and sewing. Something like 5,000 boys' and girls' clubs were organized in the rural districts in 1918. Most of these come from the rural schools as a unit, with the teacher as the local leader and the county superintendent as county club leader.

*New Hampshire.*—For the past five years efforts have been made and plans formulated for converting the old-time nature study in rural schools into elementary agriculture of a practical type. During the year 1918, that effort has culminated in enrolling 32,000 school children in home-project gardening. This has been directly under school management through the State department, local superintendents, and teachers.

*California.*—The California State Board of Education passed the following regulation relative to agricultural instruction in normal schools: "For students entering after June 30, 1919, one unit shall be required in manual training or household arts or both, and one unit in the elements in agriculture, including practical work in gardening, floriculture, and plant propagation."

*Massachusetts.*—As a result of the appointment of county club leaders in each one of the county farm bureaus in the State, a thorough canvas of the rural schools has been made in an effort to interest them in both home and school garden work and junior extension club work. From 75 to 85 per cent of the rural schools have been reached during the past two years through these agents. In a few instances this has resulted in the establishment of some definite course in agriculture or home economics in these schools.

The extension division of the college of agriculture during 1918 made an effort to arrange a course satisfactory to high-school men that would be accepted by the college for credit on admission. It is felt that this would lead to steps to establish the work in elementary schools to fit the work in the high schools.

*Wyoming.*—The only teacher-training institutions below college grade in the State are some high schools offering one year of normal training. These schools were established in the fall of 1917, and the only work in agriculture offered in such schools is a short general course in agriculture that is designed to prepare pupils to teach in the elementary schools.

*Michigan.*—Three new county normal training classes have been established in the State in the past year and a few for the purpose of training rural teachers, making in all 53 such institutions. A law was passed in 1917 requiring all persons who are teaching in the elementary schools to have at least six weeks of professional training before a teacher's license can be issued to them. In all institutions giving training for rural teachers a semester's course in elementary agriculture and in the pedagogy of such subjects is given.

*Montana.*—In 1918 a bill passed the legislature making agriculture a required subject in the elementary schools. A course of study has been prepared including agriculture. Home project work is a part of the course of study and the State superintendent of public instruction has approved credit for project work to the extent of 50 per cent each year.

*Kansas.*—The teacher-training institutions below college grade offering work in agriculture are the high schools which are reimbursed from State funds for normal training work. These high schools are offering either one-half unit or a unit of agriculture as a part of the high-school work for those who are planning to teach. Previous to 1916-17 agriculture was not a fixed requirement, now at

least one-half unit is required in all normal-training high schools. About 90 per cent of them, however, give a full unit of that work. The State grants aid of approximately \$200 for this work in approved high schools. The number of high schools giving the work now is 234, and the number giving the work before 1916-17 was 185.

*North Carolina.*—At the last session of the general assembly a bill was passed providing for a commission to be appointed by the governor for the purpose of preparing leaflets and bulletins containing courses of study, practical outlines in agriculture, to be used by the teachers as supplements to the text. Two bulletins, one for the sixth and one for the seventh grades have been prepared. These bulletins are somewhat in the form of laboratory manuals following the project plan, and it was thought by State officials that they are going to prove a great help to the teachers in making their agricultural work more practical.

*New York.*—An act of the New York State Legislature for 1917 provides for the employment of directors of agriculture in cities, towns, and school districts not maintaining a school of agriculture, mechanic arts, and home making. The purpose of this act is to employ a person who shall devote his time to interesting young people in practical agriculture and to giving technical instruction accompanying their practical work; to encourage cities and villages to employ supervisors for school, home, and vacant-lot gardening. The commissioner of education will apportion to each city, town, or school district employing or joining in the employment of a director of agriculture a sum equal to one-half the salary paid to such director, not exceeding each year the sum of \$600 for each director employed. The purpose of this work is to encourage boys and girls to undertake agricultural enterprises adapted to their home conditions. The projects may include poultry, pig, and calf raising, growing a certain area of general garden or corn, potatoes, or other farm crops. A complete scheme is found in Bulletin 654 of the University of the State of New York.

*Indiana.*—Educational Bulletin No. 32 of the Vocational Series No. 17, entitled, "Supervised Home Project and Club Work," contains what is considered the ideal organization for club work in a county. It is described as follows:

An attempt is being made in Montgomery County to perfect a more complete organization than has been possible heretofore in the State. With the financial assistance of the States Relations Service of the United States Department of Agriculture and the cooperation of all the agencies of the State and county, it is hoped that an organization will be perfected that will serve as a model for other counties.

The work in this county is being directed by the county superintendent of schools and the county agricultural agent, working through a committee representing the board of education and such allied county organizations as the com-

munity association, the county fair association, the home economics association, the chamber of commerce, and the live-stock breeders. The fullest cooperation is assured from the banks, grain elevators, and business men. The teachers and their officials and supervisors are interested and in sympathy with the movement.

Each township will employ at least one teacher as a club supervisor. This local supervision will begin February 1, and while the schools are in session each township supervisor will devote time outside of school hours to visiting schools, arousing interest and getting the enrollment. At the close of school, the time of the township supervisor will be spent in visiting club members and giving instruction.

A county director of club work, giving full time to his task, is employed for the full year. He is to work with the township supervisors and teachers, under the direction of the county superintendent and county agent. He will train supervisors, assist in supervising the instruction in agriculture, distribute literature, and correlate the work generally.

Township and county exhibits, demonstration teams, club meetings, and frequent conferences are planned.

### AGRICULTURAL EDUCATION AT MEETINGS.

#### AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The annual meeting in 1917 of the American Association for the Advancement of Science is one of the great scientific events of the year. It is a vast clearing house for ideas and results in science, and for the testing and molding of views. It presents the largest forum in this country for healthy, tempered but searching criticism in science, without which science becomes self-complacent, lux, and unexact in its requirements.

The section of agriculture confined its program to a single session and was presided over by Dr. W. H. Jordan, of the New York State Experiment Station. Taken as a whole, the discussions were a frank acknowledgement of the present limitations of our agricultural knowledge, especially the full understanding of it, and some of the difficulties in its application in successful farming. It was a somewhat critical analysis of experimental methods, and it sounded a caution against premature generalization from laboratory results to the farm. As Dr. Jordan stated, the stations have been and are still putting too much time on mere variables that have no broad significance, and too little time on broad fundamentals. He called attention to the fallacy and unwisdom of attempting to state results in terms of dollars and cents, since these have no real permanent or scientific significance.

Speaking of the training of the investigator, Dr. E. H. Bailey held that the the research man should be a student in all that the name implies. The investigator in horticulture should have a grounding in chemistry, physics, and physiology, for the grasp they give on

methods and approach. And he should have training in systematic botany, not alone for its knowledge of plants but for its key system, for the drill in comparing things that are actually comparable. His training should also give him a contemplative, reflective habit of thought; and he should always continue to be a student. Unless he continues to acquire much of his preparation as he goes, his research spirit has got its growth. The investigator must prepare himself for each separate piece of work.

In addition to this training in the sciences, emphasis was laid on the need for much study of English, to give familiarity with words and terms in order to make sharp discriminations and comparisons, and to enable clear expression of thought and deduction. This is an all too frequent lack at present. Science is exact, in expression as well as in essence. No worker has a right to be understood except in the terms of his own language. Good training in logic was also advocated, in weighing of evidence, because ability in that line is one of the prime essentials of the investigator.

#### ASSOCIATION OF AMERICAN AGRICULTURAL COLLEGES AND EXPERIMENT STATIONS.

Following the general policy adopted many years ago of meeting in alternate years in Washington, D. C., the Association of American Agricultural Colleges and Experiment Stations held its thirtieth annual convention in that city November 15-17, 1916. The selection of the Nation's capital this year seemed especially appropriate, in view of the predominance in the program of questions of nationwide significance, the important relationship developing with various branches of the Federal Government, and the plentiful evidences of the growing realization of the essential kinship and community of purpose of the institutions comprising the great Federal system of education and research for whose interests the association stands.

The program of the association was by no means restricted to agricultural lines. The interests of the association are, of course, considerably broader in scope, and this year, in particular, much emphasis was put upon what may be termed its nonagricultural phases. In the general sessions especially, aside from the addresses of the Secretary of Agriculture and the president of the association and the presentation and discussion of the reports of the standing committees, attention was centered quite largely on the proposed establishment by the Federal Government of engineering experiment stations, the development of military training in the land-grant colleges, and the best ways of conducting extension work in home economics and similar lines of interest to farm women. This trend of the convention, however, in no sense betokened a diminution of interest in

agricultural education and research. On the contrary, it may be questioned whether the realization of the outstanding importance of these phases, and especially the need of adequate and systematic provisions for research, was ever more strongly in evidence. For example, it was the dominating note in the presidential address, given by Director C. E. Thorne, of the Ohio Station, upon the subject of "Progress of education and research in agriculture." Director Thorne reviewed the history of the land-grant colleges, especially in their relations to the experiment stations, and sounded a note of warning that the temptation to neglect the work of the stations in order to take care of the great pressure for educational work must be strongly resisted if permanent progress is to be made. As he pointed out—

Science can not stand still. Every extension of the horizon of our knowledge only expands the boundary of the unknown, and makes yet more imperative the necessity for further research, and the institution which contents itself with present knowledge will soon find itself forgotten.

College instruction in agriculture was discussed from several points of view. The report of the standing committee on instruction in agriculture dealt with the question of college credit for high-school agriculture. This included a study of existing conditions by D. J. Crosby, which indicated that agriculture is now accepted as an entrance subject in 44 of the 48 States, but that only one institution allows advanced credit. It was found that agriculture is now taught in 19 per cent of the high schools of the country, and the committee considered this a factor which might well be taken into account in college instruction to a greater degree. Certain fundamental principles of agriculture, it pointed out, might be taught as effectively in the high schools as in the freshman class, or even better if the college instruction is delegated to fellows and assistants of limited years and experience.

Some obstacles, however, were recognized to the acceptance of high-school agriculture, especially the wide variation in the grade of work accomplished. Care is needed in the selection of textbooks and apparatus and the outlining of courses, and it was suggested that the colleges might here render a useful service. In 28 States there is no systematic supervision of high-school instruction in agriculture. In some States the college and the State board of education cooperate, but it was believed that the efforts of the colleges in this field should be suggestive rather than arbitrary, and should scrupulously avoid the appearance of domination.

"Methods of improvement in teaching college agriculture" was discussed by Dean W. W. Charters, of the school of education of the University of Missouri. Dean Charters pointed out that the im-

portant thing in education is not apparatus or buildings or equipment, but the classroom intercourse of teacher and student. He believed that the present teaching of agriculture is very uneven in quality. One difficulty is that the results of teaching are less tangible than those of research and therefore easy to judge in a comparative way. The code of professional ethics which bars instructors of equal rank from the classrooms of others also hinders improvements and obscures the merits of efficient teachers. More attention to the formulation and application of pedagogical principles of agricultural instruction was earnestly advocated. It is of interest to note that very similar views were expressed in the section on engineering as regards instruction in that subject, and that close cooperation with schools of education was a suggested remedy.

The thirty-first annual convention of the Association of American Agricultural Colleges and Experiment Stations, held in Washington, D. C., November 14-16, 1917, seems likely to be long remembered as one of the most interesting and inspiring in the history of the organization.

The important service of the land-grant institutions in this country was attested by several speakers. Thus Secretary Houston declared that while at the time the country entered the war the Nation was not fully prepared for war in any respect—

it was fortunately circumstanced in the character of its agricultural organization and the number and efficiency of its expert agencies. In fact, in efficient machinery for directing agricultural activity as represented by the land-grant colleges, the Federal Department of Agriculture, farmers' organizations, and its alert and patriotic rural population, it excelled any other two or three nations in the world combined.

"The Nation may well pride itself," he said, "on the fact that it had had the foresight generations ago to lay deep its agricultural foundations." He congratulated the representatives of the land-grant colleges on the fine opportunity for service presented to them and on the splendid way in which they had seized it:

The Department of Agriculture has had great comfort in the thought that these institutions, ably planned and wisely directed, existed in every part of the Nation and stood ready not only to place themselves at the service of the National Government but also to take the initiative in a vast number of directions.

The duty of the agricultural colleges in teacher training was pointed out by the standing committee on instruction in agriculture in its report on college teaching in agriculture, with particular reference to the improvement of methods. In this report the committee expressed the view that:

Strong departments of agricultural education will be needed under the administration of the Smith-Hughes Act in order to give the colleges of agricul-

ture the positions they should occupy in the training of teachers of agriculture. Unless these colleges take up the teacher-training work actively at the present time, the funds provided for this work under the Smith-Hughes Act are likely in many States to be divided among a number of institutions, including some of relatively low grade and poor equipment, with the result that our whole system for training teachers of agriculture will be fundamentally weak. The agricultural colleges ought to have a clear leadership in this field, and they can not have this unless they adequately equip their departments of agricultural education.

The committee also urged the development of such departments as a means of improvement of college teaching in general. It was recognized that in the past a large proportion of college graduates without special pedagogical training have done well as teachers, but—

they have succeeded in spite of the lack of professional training, and the percentage and degree of successes might have been much larger if the professional training had been provided. No matter how well manned and equipped the subject matter departments of the colleges of agriculture may be, they need the help of strong departments of agricultural education, not only in the training of undergraduates for teaching positions but also in improving the quality of teaching within the subject matter departments.

The 1917 convention revealed how closely the war has been brought home to the land-grant institutions, depleting the faculty and student body, interrupting many well-established projects, and compelling a redirecting of their entire program and point of view. More strongly, however, did it indicate how largely the Nation is relying on these institutions in the present emergency, and how important are the functions which are theirs to fulfill. It put this great body of public-service institutions, already conspicuous for a season's successful endeavor, formally on record as enlisted for the war, and with their full resources mobilized in the national service.

#### NATIONAL DAIRY SCHOOL.

The first New England meeting of the National Dairy Show was held at Springfield, Mass., October 12-21, 1916, on the grounds of the Eastern States Agricultural and Industrial Exposition. All previous records for attendance, exhibits, and profits are said to have been broken. Nearly 1,000 entries of dairy stock were on exhibition, and the attendance is estimated as averaging close to 30,000 per day.

Much prominence was given to educational features at the show. The United States Department of Agriculture gave special attention to its extension work among boys and girls, with several thousand exhibits of their work and many demonstrations by boys and girls illustrating methods in canning, bread making, dairying, selection of seed corn and potatoes, gardening, treatment of plant

diseases, etc. A working dairy was also in operation by the department.

The intercollegiate stock judging contest was participated in by 18 institutions, many being represented for the first time. The highest rating for all breeds was attained by the University of Nebraska, with New Hampshire first on Ayrshires, Kansas on Guernseys, Massachusetts on Jerseys, and Nebraska on Holstein-Friesians.

There was also an intercollegiate butter judging contest, arranged for the first time. In this contest nine institutions were represented, first place being awarded to the Pennsylvania College.

After a lapse of three years, occasioned by the foot-and-mouth disease situation, the Fourteenth International Live Stock Exposition was held at Chicago in December, 1916. The agricultural colleges were again strongly in evidence, both the grand champion and the reserve champion in the bullock section coming from the University of California.

A new feature of the show is to be a special exhibit each year from some one agricultural college. The institution selected to initiate this practice was the University of Illinois, which depicted in miniature its campus and buildings and likewise a model farm divided into fields supporting a profitable and soil-building rotation as well as much other illustrative material.

At the students' stock judging contest, 16 institutions were represented, 3 for the first time. The first place was awarded to the team from Purdue University, second to the Iowa State College, and third to the Ohio State University.

Following a meeting called by the American Pomological Society, a National Congress of Horticulture was organized at Washington, D. C., in November, 1916, to serve as a central clearing house of horticultural interests. Active membership is to consist of delegates appointed by affiliated horticultural organizations on the basis of membership, and it is hoped thus to enroll representatives of from 50,000 to 60,000 members.

#### AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF AGRICULTURAL TEACHING.

The seventh annual meeting of the American Association for the Advancement of Agricultural Teaching was held in Washington, D. C., November 14, 1916. Two main topics were presented for discussion, the content of the course in the college of agriculture for prospective high-school teachers of agriculture and the high-school course in agriculture.

Under the first of these, Dean C. F. Curtiss discussed the relation of the sciences. He thought that the science taught ought to be

applied science, which will directly connect up with the work of the farmer and the community in which the teachers will serve.

As to general professional subjects, K. L. Hatch held that psychology is the basis of the professional preparation, but that whether or not there should be a course in general education is doubtful. The student's time is so taken up with technical work in agriculture that an effort should be made to reduce the professional preparation to the minimum. The course in agricultural education ought to include the principles of general methods. A certain amount of practice work should be required with real students, with real classes and conditions, and with problems teachers are going to meet. Prof. Hatch also discussed at length the growing demand for a course in the college known as general science or elementary science. In discussing this paper R. W. Stimson laid stress upon the importance of training college teachers of agriculture, if for no other reason than that the prospective teachers coming under their influence may imitate good teaching.

G. A. Works took up "The content of the methods course for high-school teachers of agriculture," outlining the work given in the New York State College of Agriculture. This course, which is given three or four times a year, is open only to seniors. It runs for a term with two discussion periods and one laboratory period  $2\frac{1}{2}$  hours in length each week. The class is limited to 50 and each laboratory section to 12 students. The laboratory and lecture work are closely correlated throughout the course, and special attention is given to the selection of material adapted to the high-school pupil and to its arrangement in seasonal sequence. Other topics taken up are the place of the home project and the organization of study material for the recitation-lesson, the laboratory, and the field trip. A visit to a near-by high school is made for the purpose of studying equipment, library, and home projects, and some work is done in chart making and bulletin collecting and cataloguing.

In a paper on "How to connect the high-school work with practical farm operations," A. K. Getman suggested (1) a seasonal distribution of the topics studied, the study to coincide with the operations on the farm; (2) provision for field and laboratory work; and (3) the use of the home project properly planned, accounted, summarized, and supervised.

C. H. Lane, in a paper on "The content of high-school courses in agriculture," said that it is not merely a question of what is worth teaching and studying, but what is best considering all local conditions, equipment, time, teacher, community interests, adaptations, etc. Thus, the determination of the content and arrangement of a course in agriculture becomes a local problem and no general solution can

be given that will apply equally well to all localities. The following outline of work was, however, suggested: First year, practical work on how plants grow, soils and fertilizers, and field crops or fruits and vegetables, the choice depending upon local conditions as regards available material and interest in home project work. The second year should be given to the study of live stock. After such general courses the student is prepared for more special work. In sections where horticulture is important the third year may well be spent in such specialized branches of plant production as fruit growing, practical work on soils and fertilizers, cover crops, etc., as relate to the production of fruit, or market or vegetable gardening, and one-third of a unit on improvement of home grounds and ornamental planting.

Similar specialized courses should be provided in districts where one or more field crops, dairying, or some other special phase of animal husbandry predominates. In districts having broad interests in agriculture the school should be equipped to offer a number of special courses during the third and fourth years. While the subject of tools, implements, and machinery is necessarily considered in connection with crop production, the subject of farm mechanics is deemed sufficiently important to receive special attention during the fourth year. A half unit in rural economics and farm management should not preclude careful accounting in connection with the projects of each of the previous years nor the study of simple methods of accounting in connection therewith.

#### NATIONAL EDUCATION ASSOCIATION.

The usual attention was given at the meeting of the National Education Association at Portland, Oreg., July 7-14, 1917. The general topic considered by the National Council was "Agricultural preparedness and food conservation." W. H. Campbell, representing the Farmers' Educational and Cooperative Union of America, presented a paper at the section of the Department of Rural and Agricultural Education on "The rural people a strong factor in rural education problems," which dealt with the revision of the whole educational system of this country from the top down and with the building of a centralized school and its development into a community center for the people in Johnson County, Nebr. The speaker urged that the universities and normal schools be put on a full year, four-quarter plan, and have a department that will receive mature students who have completed the rural school. These universities and normal schools will then be in position to release students for winter vacations for the purpose of teaching short winter terms in the country. These terms should include a course strong in agriculture and domestic science, farm accounting, manual training, and mathematics.

In an illustrated address on "Results achieved in secondary agriculture and methods pursued in actual practice," H. N. Goddard of the Department of Education of Madison, Wis., indicated the progress in the development of secondary agricultural instruction. He stated that two viewpoints have developed in relation to the work, the informational or cultural and the vocational. The latter has gained in relative importance while the informational idea lacks sufficient motive and fails to give vocational training.

In the opinion of the speaker the school plot is a valuable school project and is desirable wherever it can be made certain that it can be well cared for during the summer vacation. The school farm of large size offers many difficulties and should not usually be undertaken in high-school departments. Among successful school or group projects, aside from the school plot, are steer fattening, keeping dairy cows, cow testing, poultry work, shopwork, and construction of all kinds of farm buildings. The school plot should be used for crop production demonstrations, illustrative material, and out-of-door experiments. Home or individual projects, regarded as the more fundamental, have included practically every phase of farm practice that can be carried out on the home farm or garden. Exhibits and contests have been very commonly developed in connection with the projects. Most important of all is the annual school fair held in most high-school departments, where the productive results are rounded up in direct connection with the school community. A large amount of extension work has been carried on. A large general result of all the work has been evident in greater interest and intelligence in the best farm practice and in rural life. A large per cent of the boys and girls in these courses are actually going back to the farms with minds awakened and trained for enthusiastic and efficient work. Many city boys have also been directed to the farm for their future occupation.

It is the unanimous opinion of this department of the association that the time has fully arrived for the establishment of special normal schools whose sole function is the study of industrial, social, and educational rural problems, and the training of teachers who are able to cope with these problems.

#### AGRICULTURAL EDUCATION IN OTHER COUNTRIES.

##### AMERICA.

A fifth school of agriculture has been erected at Glen, in the Orange Free State, the opening of which has been postponed because of the financial stringency created by the war. It has a farm of 4,000 acres, acquired at a cost of \$97,200, and school and farm buildings erected at a cost of \$104,400.

The schools, which are located at Elsenburg, Middelburg, Cedara, and Potchefstroom, and the new school at Glen, are located on large, well-stocked, and well-equipped farms, and offer the following courses: A one-year certificate course including theoretical and practical instruction in agriculture and live stock, farm economics and bookkeeping, agricultural engineering, veterinary science, poultry husbandry, horticulture, viticulture (at Elsenburg), and dairying; a two-year diploma course, including, in addition to the preceding subjects, agricultural chemistry and geology, agricultural botany and bacteriology, and agricultural zoology and entomology; a three-year advanced diploma course; a special course in dairying at the Grootfontein school at Middelburg, followed by practical work in a factory dairy; a two-week short winter course open also to women. At the request of the university council of the Cape of Good Hope, courses have been prepared and submitted for the third and fourth years at the agricultural schools for the degree of B. S. in agriculture.

#### BRITISH ISLANDS.

In 1916 the Board of Agriculture and Fisheries, dealing with the agricultural education work of the various institutions and local authorities in England and Wales, decided as a measure of war economy, to suspend the grants to the Harris Institute, Preston, and to the Royal Horticultural Society's School at Wisley. The Royal Agricultural College, Cirencester, and the Agricultural College, Uckfield, Sussex, were closed in the summer of 1915, owing mainly to the serious decrease in attendance. All of the institutions have suffered as a result of the war. The new buildings at the Armstrong College, Newcastle, have been wholly utilized as a hospital since the beginning of the war, and rooms in the School of Agriculture, Cambridge, and in Wye College, were occupied for a time for military purposes. The Royal Veterinary College, London, is the only institution whose activities have not seriously diminished. To encourage cheese making instead of butter making, with a view both of conserving the food supply and the economical utilization of surplus milk, the board developed a scheme of establishing traveling cheese schools, under which it loaned sets of apparatus to local authorities who agreed to make new and additional provision for itinerant instruction in this subject. Nineteen authorities availed themselves of this offer, and 33 new schools were created in addition to 5 previously in existence.

A report in 1916 on the question of education in its relation to agriculture, with special reference to the problem of how to increase the annual output of skilled cultivators of and workers on the land, by the education committee of the Central and Associated Chambers of Agriculture of Great Britain shows that 50 years ago the number of men working on the land in the United Kingdom was greater by

1,000,000 than it is to-day and to the concurrent steady decline in the production of the land. The committee recommends that the instruction of the elementary schools be made more practical and more truly based upon surrounding life; that new schools of the following types be created: (1) Centralized continuation day schools of the type existing in Canada, (2) the creation of a system of lower-grade instruction centers with courses that would review, complement, and give a more directly vocational bearing to the practical work already done in the schools for boys and girls, (3) a new type of farm school for boys and girls between 13 and 18 years of age to continue the instruction from the elementary school and definitely prepare them for settling on the land either in the United Kingdom or in the British Dominions, and (4) farm lads' clubs; that definite measures should be taken to interest the children in town schools in country life and to induce more poor law children to become interested in the cultivation of the land; that as far as possible all reformatories and industrial schools should have farms attached and the pupils be more directly encouraged to study agriculture; that continuation instruction should be compulsory; and the development of training to enable country children to enter the teaching profession.

Plans are under consideration for the establishment by the Board of Agriculture and Fisheries and the Board of Development Commissioners of Great Britain of a research institute for problems relating to agricultural machinery at Cambridge University in connection with the existing schools of agriculture and engineering.

A movement is on foot to raise a fund of \$750,000 for the erection of new science buildings at the University College of North Wales "as a memorial to the men of North Wales who have fallen in the war." A gift of \$100,000 has already been secured. It is announced that special prominence is to be given in the new buildings to agriculture and forestry.

The Southeastern Agricultural College at Wye, England, has organized a research and advisory department distinct from the teaching side of the college and governed by a separate representative committee, composed in part of research workers at the institution and in part of other scientific men. Some of the work in progress and in contemplation includes problems connected with the general practice of fruit growing, the biological study of flax, the conservation of fruits and vegetables, pasture studies, diseases of sheep, hog breeding, and fungus diseases and insect pests and their treatment by spraying.

The tropical school of agriculture which was opened at Peradeniya, Ceylon, January 25, 1918, received 77 students during its first year of operation. Each student had to cultivate one-sixteenth acre and grow three crops on it, a pulse, a grain, and a vegetable, conducting

all the operations himself. The average age of the students was 21 years. The school staff consisted of a registrar and four agricultural teachers who held the diploma of the Pooma Agricultural College and who carried out the ground work in all subjects. Ceylon had a total of 327 school gardens in 1916, an increase of 40 over the previous year. Government grants were received by over 160 schools for school-garden work.

#### CANADA.

In the four years that the agricultural instruction act has been in operation it has contributed a total of \$3,400,000 to the Provinces. With the year 1917-18 the grants reach their maximum of \$1,100,000 a year to continue until the completion of the act on March 31, 1923.

In the Province of Prince Edward Island, \$2,500 is set aside for bonuses to teachers who give instruction in nature study and agriculture. Teachers especially trained in two sessions of the summer school receive \$7 for the first half year and \$5 for the second; those especially trained in one session of the summer school receive \$6 and \$4; and those who have not attended summer school but are doing creditable work receive \$5 and \$3. The requirements for grants include: (1) Systematic instruction in rural science in the school every week throughout the term; (2) a written report on the provided form to the department of education at the close of the term showing the instruction that has been given; (3) pupils' records of the work systematically kept in special rural science notebooks; and (4) supervised projects or gardens at the pupils' homes, or a well-kept school garden in which there are some valuable demonstrations and experiments with vegetables or field crops, or with both, as well as attractive flower beds and borders. A school garden neglected in the summer holidays will disqualify for part or all of the bonus.

In 1916 the provincial ministry of agriculture of British Columbia, which until then had always been united with some other ministry, was made a separate and distinct department.

Agricultural instruction has recently been introduced into the high schools of British Columbia in a systematic way. The first class in the Province was organized in September, 1915, and was followed by similar instruction in four other high schools in September, 1916. The instruction is being given by agricultural specialists, and is attended by a total of about 130 boys and girls. A two-year course has been outlined for these schools.

Equipment costing about \$400 is available in each school, with from one-half to one acre of land for experimental and demonstration plots. The salary of the instructor is paid by the provincial department of education, and the remaining expenses by the local authorities.

The Alberta Department of Agriculture began extension work in agriculture last spring with district agents in the field at various points in the Province. The minister of education is cooperating to the extent of making the time of the classes in school available to the agents for the carrying on of the work in cooperation with the teacher and inspector. The plan is to have the pupils take actual part in the growing of garden crops, the raising of chickens, and the feeding and management of young stock on their own farms. Initial group instruction in the laying out, planning, and general cultivation of the home garden is given in the schools, where leaflets and bulletins, seeds, and a limited number of eggs are distributed. Competitions in caring for stock are carried on and the season's program culminates in a fall fair held in conjunction with the district fair or at the most convenient school or village center. The work is being conducted in five centers and about 100 schools are taking part in it.

In a special effort to populate and bring under cultivation large areas in northern Ontario, an agricultural high school and demonstration farms at New Liskeard, a government creamery at the same place, a 50-acre demonstration field near Matheson, and a plant breeding station at Fort William are to be established.

Plans are also under way for the necessary buildings and equipment for a new agricultural school to be established, through the Ontario Department of Agriculture, near Kemptville in eastern Ontario. It is intended to give useful and practical instruction in agriculture to young men between the ages of 16 and 25 who have left school. It is not proposed to duplicate anything already being done in the Province unless to some extent the first two years of the course at the Ontario Agricultural College. The regular course will not be longer than two years and there may also be a number of short courses.

Special provision has been made in Ontario for furnishing homesteads to returning soldiers. These soldiers will first be sent to an agricultural training depot being established at the Government experimental farm at Monteith, where they will receive instruction. When a sufficient number have been trained, a farm colony will be opened at some point along the railway in charge of a competent superintendent. Farms containing not over 80 acres will be laid out and so planned as to bring the various farm houses as closely together as possible. A 10-acre tract will be cleared on each farm, and when this is completed the farm may be allotted free of charge to a soldier. He may also receive machinery, live stock, etc., to the value of \$500, this being reimbursable within 20 years. The final title to the land will be given after five years. The community system will be fol-

lowed in supplying horses, other stock, and implements, and cooperative methods of buying and selling will be used.

Other plans for placing soldiers on the land are also under consideration.

The chief of the Military Convalescent Home of Sans Brûit, Quebec, has made arrangements for teaching agriculture to convalescent soldiers, the courses being in charge of a district agricultural representative. Instruction has been given in practical work in drainage surveys and rotations on the hospital farm, commercial poultry keeping, market gardening, and beekeeping. Some of the convalescents have also helped in field husbandry, soil preparation, harvesting, etc.

What are known as the royal agricultural schools, incorporated by the legislature of Quebec, are designed to give instruction to the sons of soldiers. These schools and farms are situated in the township of Howard, Argenteuil County, and are open to the sons of all soldiers who have taken part in the war. The property of the schools consists of 3,468 acres, with a large residential building to accommodate 25 boys, a residence for teachers, and a number of cottages for workmen. The parents of the boys will be under no expense for their sons while they are at the schools, and when of sufficient age the boys will be assisted in making a start for themselves.

#### CHINA

Considerable attention is now devoted in China to agricultural education and experimentation in various classes of institutions. An experiment station was located at Peking in 1907, under the control of the board of agriculture, industry, and commerce. An experimental tract of nearly 300 acres is available, and departments of crops, soils, animal husbandry, horticulture, floriculture, entomology, botany, forestry, bacteriology, and biology have been put in operation. In 1907 an agricultural college was organized in connection with the station, but this was disbanded in 1915.

Subsequently an agricultural college and experiment station was established at the capital of each Province along much the same lines as at Peking, and many other stations in addition. There are now reported to be 130 stations in the 22 Provinces, of which 31 are in Chihli, 25 in Szechwan, 15 in Hu-Long-Kiang, 7 in Hupoh, and 7 in Kwangtung.

Among these are two cotton-experiment stations, one at Cheng Ting Hsien, Chihli, and one at Nan Tung Chou, Kiangsu, with a third under consideration at Tung Hsing Chou, Hupoh. Experiments are being conducted at these stations in seed selection, seed distribution, plant harvesting, soils and manures, treatment of pests, and cotton weaving. A corps of students is also being trained at these stations.

Stock-raising experiment stations have been established at Kalgan and Shih Men Shan, Anhui. These are expected to study the improvement of breeds of domestic animals, promote the breeding and sale of stock and stock-raising enterprises, and the cultivation of forage crops.

Considerable attention is also being devoted to forestry in China. A department of forestry was organized in January, 1916, with a forestry commissioner in each province. Forestry-experiment stations and training schools have been established at Ch'ang Ch'in Hsien, Shantung, and in the Temple of Heaven at Peking.

The university at Nanking has maintained a college of agriculture and a school of forestry for several years. This is an American-supported institution, and in 1915 had enrolled about 70 students in agriculture. A colonization association has been organized under its auspices, with provision for the reservation of about 35 acres in each colony for a model farm. A tract already purchased on Purple Mountain, just outside Nanking, is to be used as an experiment station in connection with the different colonies.

An agricultural experiment station was opened at Nanksuchou, Anhwei, in 1915, as a part of the American Presbyterian mission station. Agricultural work was taken up at this institution partly as a practical way to teach Christianity, partly to make friends, and partly to improve economic conditions. The station is located on the railway between Nanking and Tientsin, and attempts to serve an area of about 6,000 square miles and from 1,500,000 to 2,000,000 people. The farming methods in use are those of from one to two thousand years ago. Special prominence is being given in the experimental work to seed selection, better tillage methods, more and better fertilization, drainage, and animal husbandry. The work is to be largely of a demonstration nature during the present pioneer stage, and will also include an agricultural school, a school farm, and short winter courses for farmers.

#### LATIN AMERICA.

According to the Bulletin of the Pan American Union a practical school of agriculture has been opened at Aconcagua, in Chile, and steps have been taken to found an agricultural school for women in the Province of Aconcagua.

The agricultural school at Challapata, Bolivia, for the instruction of the natives has been moved to Rosario Plantation, near the town of Challapata, and enlarged.

A recent executive decree in Colombia provides for the establishment of a tropical agricultural station annexed to the national institute of agronomy in the municipality of San Lorenzo, Department of Tolima. General instruction is expected to be given in various branches of agriculture and allied sciences, including veterinary science, and courses will also be arranged for students who desire to

specialize along certain lines. Particular attention will be paid to teaching students how to distinguish beneficial from injurious insects met with in practical agriculture. The government of the Department of Antioquia has taken preliminary steps to establish a laboratory for the manufacture of vaccine to be used by stockmen in the prevention of murrain and similar diseases of cattle. A recent executive decree places the national meteorological service, established in 1917, under the department of public instruction.

The school of agricultural mechanics at Bahía Blanca, Argentina, which admits pupils of not less than 17 years of age, had an attendance of 32 in 1916. The shops of the school have been equipped with new machinery.

The Department of Agriculture of the Dominican Republic has provided a traveling agricultural instructor to recommend measures for obtaining more abundant yields of staple crops. An agricultural school was recently organized at Charpentier, Haiti.

An agricultural experiment station of the coeducational schools of Amatitlán, Guatemala, recently began operations, the equipment having been donated by a philanthropic citizen of the community.

In Mexico a school of agriculture was opened in Hermosillo, the capital of the State of Sonora, in March, 1917, under the direction of the governor of that Commonwealth. In the same month a national forestry school was inaugurated at Coyocacán, a suburb of the City of Mexico. The agricultural experiment stations in the States of Vera Cruz, Puebla, San Luis Potosí, Oaxaca, and Tabasco have been supplied with modern machinery and appliances, as well as improved seeds, and instruction by experts will be given to farmers in these States. A publication entitled *Revista Agrícola* has been founded in the national capital.

An agricultural school has been established in the Department of León, Nicaragua, with Manuel Godoy as president. The Government has also formulated a plan for a course of instruction in the new national school of agriculture, according to which there will be a section for the instruction of laborers or farm hands, a section for agriculturists or farmers, and a section for agronomists or agricultural engineers. The governor of each Province is to select by competitive contests two boys who have passed the fourth grade of primary instruction and are over 13 years of age for entrance into this school at the expense of the State. A school for boys not over 16 years of age who have studied agronomy for at least a year was opened recently at Chinandega City, with an appropriation of \$5,000 for its installation. It is equipped with up-to-date machinery and implements necessary for the proper cultivation of cereals and other crops, and makes a specialty of teaching its pupils the practical use and advantages of machinery in agricultural operations.

The Government of Uruguay has granted 10 scholarships in its agricultural school to young Paraguayans who desire to continue their studies in Uruguay.

An executive decree in Uruguay places its agronomic stations under the immediate supervision and control of the Department of Fomento. At the suggestion of the park commission of Montevideo, a school for gardeners has been established in the national capital for the purpose of supplying special skilled labor of this kind.

School and Society announces that a Pan-American university has been established in the Republic of Panama. The trustees are to consist of the Secretary of Public Instruction of Panama and the diplomatic representatives of the American Republics or their delegates, together with similar representatives of other nations which may maintain chairs in the university. It is hoped that the institution may be of international value, especially along the lines of medicine, law, and agriculture.

In Venezuela, a presidential decree of March 12, 1917, creates an experimental station of agriculture and forestry, with an acclimatization garden, to be located near Caracas, and intended to serve as a model for other such stations to be established in other parts of the Republic. The objects of the station are the improvement of the methods of cultivation of the principal agricultural products of the country; the introduction, selection, and distribution of seeds; experiments in reforestation; the suitability of soils to crops and of crops to the various regions; and practical work for the training of agricultural foremen and forest rangers.

The Council of Public Instruction of Ecuador has arranged to establish an agricultural class connected with the faculty of science of Central University at Quito. The professor in charge of this course is also to edit an official bulletin to encourage the study of agriculture.

#### PHILIPPINE ISLANDS.

Beginning with the school year 1917-18, all schools where a course in farming is given are to be in session throughout the year. This is not entirely a new venture, as for several years all settlement farm schools and most agricultural schools have been in continuous session, and notwithstanding the younger pupils enrolled in them, these schools have maintained the best farms.

The calendar year has been divided into 12 weeks of classroom work, 4 weeks of special field practice, 4 weeks of vacation, and 1 week each for examinations and an annual cleaning up. Each pupil enrolled will be given a vacation of 4 weeks at the time in the year that the farm activities can best spare his services. All teachers assigned to farm schools are required to render service throughout the

school year, except that short vacations may be given when their services can be spared.

It is believed that students should be detailed to definite projects and thereby become factors in a productive enterprise. Each pupil is expected to do field work for not less than 4 consecutive periods (160 minutes) each day for 5 days a week, and daily field work up to 3.5 hours may be required at the option of the principal. Each pupil is required to perform at least 3 hours of field work on every other Saturday forenoon.

#### EDUCATIONAL WORK OF THE DEPARTMENT OF AGRICULTURE.

During the past two years extension education through specialists has become prominent, both at the State agricultural colleges and in the Department of Agriculture. Both at the State agricultural college and in the Department of Agriculture are specialists in various branches of agriculture who aid county agents in their work, and also give direct instruction to farmers in counties where there are no county agents. A specialist is generally an extension agent who has a very thorough knowledge of some particular line of work and who is efficient in presenting his subject to the county agents and the farmers. He may be differentiated from the county agent in that the county agent has to cover in a more or less thorough way the entire field of agriculture, whereas the specialist's field of work is generally limited to a narrow field, such as dairying, horticulture, poultry, etc.

The principal lines of extension work of this character being conducted in the Department of Agriculture are hog-cholera work, pig and poultry clubs, dairying, and animal husbandry, through the Bureau of Animal Industry. All of this work is conducted in cooperation with the agricultural colleges in the several States under project agreements mutually entered into as a part of the general system of cooperation under the general memorandum of understanding between the Secretary of Agriculture and the colleges of agriculture.

In hog-cholera work veterinary field agents have been appointed to cooperate with county agents and demonstrate to them and to local veterinarians and farmers the prevention of loss from hog cholera and of the spread of the disease from herd to herd by the use of the serum treatment and proper quarantine and sanitation of premises.

In the dairy-extension work specialists are appointed to conduct work in the various States through county agents and otherwise by organizing cow-testing associations, bull associations, teaching the keeping of herd records, planning the construction of silos, the remodeling of dairy barns, milk houses, and other dairy buildings, establishing feeding demonstrations, management of herds, and other special dairy-farm problems.

In soils, forestry, plant pathology, marketing and rural organization, etc., specialists are also employed to carry on extension work.

In addition to the fund provided for the regular cooperative agricultural extension work, Congress passed in 1917 the food-production act, which includes an item of \$4,348,400 for increasing food production, eliminating waste, and promoting conservation of food, by educational and demonstrational methods through counties, districts, and urban agents, and others. Under the provision of this act over 1,600 emergency demonstration agents have been employed, and for the first time agents have been designated to take up work in the larger urban centers.

The enrollment in the South in boys' and girls' agricultural clubs increased in 1917 and now approximates 100,000 in the regular clubs. In addition to the regular enrollment, approximately 20,000 were enrolled to assist in meeting the emergency incidental to the war. A large number were enrolled in wheat clubs for 1918, wheat, rye, and oat clubs being organized wherever the growing of these crops was thought to be practicable.

Farm makers' clubs for negro children were organized during 1917 in several States. Much work has been done every year in these clubs among the negroes, but it was systematized as a separate project in 1916.

Pig and poultry clubs promoted in cooperation with the animal husbandry division of the Bureau of Animal Industry are very popular. Poultry clubs which consist largely of school pupils are usually organized in the schools through the direction of the county agents, the teachers serving as local leaders or supervisors of the work. Officers, including a president, vice president, and secretary are elected, meetings held as regularly as possible, and the work carried on in an educational and businesslike manner. The State poultry club agents or poultry specialists working under the supervision of the Animal Husbandry Division, Department of Agriculture, and the director of extension at the State agricultural college, visit these schools and deliver lectures on various subjects as well as give actual demonstrations on selecting, culling, killing, and dressing for market, and other phases of poultry work.

For the fiscal year ending November 1, 1917, 8 States, comprising 281 counties, were carrying on the work, representing 1,010 clubs and 13,664 members. Club members furnishing reports hatched, during 1917, 98,272 chicks and raised 80,310 mature fowls. They sold \$17,908.25 worth of poultry and eggs for market and breeding purposes and the total value of their receipts, stock on hand, and prizes won amounted to \$41,312.42. In addition to other school work, these poultry club members are becoming proficient in the selection and judging of standard-bred poultry, and also demonstrating their ability to carry on various phases of poultry work, such as operating

incubators, preserving eggs, caponizing cockerels, killing and dressing fowls for market, etc.

Boys' and girls' pig clubs are also quite closely interwoven with the rural-school system. The pig clubs are usually organized around a school or community as a unit. The rural teachers are recognizing the value of pig clubs as a vitalizing factor in school work and are heartily supporting it. Many rural teachers are acting as local leaders, and swine extension workers visit the schools and give lectures, demonstrations, etc., on swine work.

The school pig is one phase of the pig club work in which the rural school is especially prominent. A great many rural schools have raised a pig on the school grounds, the pig usually being fed on the scraps from the children's dinner pails.

The progress made in boys' and girls' pig club work has been quite satisfactory. During the past year 35,980 members completed their pig club work, and there are now more than 100,000 boys and girls enrolled for this season's work. The average profit of the members fattening a pig was \$11.38, and that of the members raising a sow and litter was \$72.84. Seventy-one per cent of the members raising breeding stock had pure-bred animals. Pig club work is now carried on in 28 States.

During the year ending June 30, 1917, there were in the 33 Northern and Western States 1,124 paid leaders working in connection with the boys' and girls' club work. In addition to the paid leaders there were 9,748 volunteer club leaders. Two hundred and forty club leaders were paid cooperatively by the State and the United States Department of Agriculture, 133 by the State agricultural college and the local people, 18 by the college only, and 733 by the local people.

During the year ending June 30, 1917, there were in the 33 Northern and Western States a total enrollment of 406,633 members of regularly organized clubs. In addition to this about 400,000 boys and girls were enrolled in the war-emergency projects—growing gardens, canning food products, raising poultry, making war bread, and doing other things of a special character.

During the period from December 1, 1916, to April 1, 1917, 3,589 club members in the Northern and Western States attended the one or two weeks' short courses at the State agricultural colleges; 1,528 of these were champions of their respective counties in the boys' and girls' club work and were sent by the local people free of expense to attend the courses.

The division for agricultural instruction of the States Relations Service continued its project which had to do with the study of the methods of organization and administration of instruction in agriculture in public schools, the training of teachers for this work.

and the relationship of different agencies in promoting such instruction. Under this second project four additional conferences dealing with the problem of teacher training in land-grant colleges (making seven in all) have been held. The aim of these conferences held both in the North and the South was to work out a tentative course which may be taken as a guide for training teachers in agriculture and to cooperate the various forces and agencies which would promote agricultural education.

This division has continued its work in the preparation of courses of study for teachers of elementary agriculture in cooperation with State agricultural colleges, experiment stations, and State departments of education. Bulletins have been prepared and published for the schools of Virginia and Ohio. Similar courses have been prepared for Vermont. In addition to these bulletins others have been issued dealing with the elementary school courses in agriculture; among the recent ones are Lessons on Tomatoes for Rural Schools, Lessons in Poultry for Rural Schools, Lessons on Pork Production for Rural Schools, Lessons in Dairying for Rural Schools.

The publication of the Agricultural Education Monthly has been discontinued and in its place have been issued a series of documents dealing with various phases of secondary instruction in agriculture.

A series of leaflets on how teachers may use Farmers' Bulletins have been prepared. Twenty-one in all have been prepared, of which 18 have been published.

The beginning of the administration of the Smith-Hughes act has brought demands for a large amount of service which has not been in printed or multigraphed form. A memorandum of cooperation between the Federal Board for Vocational Education, the Bureau of Education of the Department of the Interior, and this bureau contemplates a series of investigations under the Smith-Hughes Act, a part of which shall be conducted by the division of agricultural instruction. The committee representing this cooperative work has already begun the plans for such studies. A bulletin on the home project as a phase of vocational agriculture has been prepared by this division at the request of the Federal Board for Vocational Education and submitted to the board for publication.

This division has made an extensive study of the problems of visual instruction in agricultural education and has completed a series of lantern-slide lecture sets dealing with various phases of agricultural education. Among those more recently added to the list are How to Teach Poultry Lessons in Elementary Schools, Lessons on Tomatoes for Rural Schools, and Teaching Garden Practice.

Plans have been developed by means of which illustrative material of various types may be made more available to schools in the several States, especially to help State officers prepare duplicates of our material.

The literature on agricultural education has been reviewed and abstracted by this office. Card indexes of the world's literature of agricultural education, as well as American and foreign institutions for agricultural education and home economics, were maintained by the division.

#### THE AGRICULTURAL COLLEGES.

The declaration of a state of war in April, 1917, profoundly affected our system of higher education in agriculture almost immediately. Attendance, which in most land-grant colleges had been steadily rising from year to year was suddenly depleted as the call came for one form or another of national service. Some institutions closed their doors early in May and in others the work went on under greatly changed conditions.

In response to an inquiry from the Secretary of the Interior as to the duty of the land-grant colleges and technical schools during the war, the situation was admirably stated by President Wilson in a letter of July 20, 1917, as follows:

The question which you have brought to my attention is one of the very greatest moment. It would, as you suggest, seriously impair America's prospects of success in this war if the supply of highly trained men were unnecessarily diminished. There will be need for a larger number of persons expert in the various fields of applied science than ever before. Such persons will be needed both during the war and after its close. I therefore have no hesitation in urging colleges and technical schools to endeavor to maintain their courses as far as possible on the usual basis. There will be many young men from these institutions who will serve in the armed forces of the country. Those who fall below the age of selective conscription and who do not enlist may feel that by pursuing their courses with earnestness and diligence they also are preparing themselves for valuable service to the Nation. I would particularly urge upon the young people who are leaving our high schools that as many of them as can do so avail themselves this year of the opportunities offered by the colleges and technical schools, to the end that the country may not lack an adequate supply of trained men and women.

It will be noted that in this statement particular stress is laid upon the need for men trained in applied science. In this group will be included, of course, the graduates of the agricultural colleges. In view of the important and unique functions which these institutions have to fulfill, and the realization that in some ways the conditions regarding their prospective attendance differed from those in other institutions, it was deemed of general interest to ascertain, after their reopening in the fall of 1917, how they had fared as regards enrollment. A general survey of the existing situation showed that the average decrease for the institutions reporting was slightly over 30 per cent and in numerous cases exceeded 50 per cent. Some sectional variation was noticeable, several southeastern colleges maintaining their previous registration and others falling only

slightly below it, while losses were exceptionally heavy in the Southwest and in the Middle West.

On the other hand, the average decrease in mechanic arts was approximately only 15 per cent and did not exceed 36 per cent for any institution.

Analysis of the registration by classes in the agricultural colleges revealed heavy losses at every stage. As would be expected, the senior class was largely effected, decreases from 40 to 60 per cent being not uncommon.

The depletion of the junior and sophomore ranks was found to be somewhat smaller in most institutions.

The entering classes, however, present a special problem for consideration. Before the war steadily increasing numbers of freshmen, in many cases taxing the capacity of the college, had been the rule, but in the fall of 1917, 36 institutions reported losses ranging from 8 to 60 per cent. The Texas College reported an increase of over 12 per cent, resulting in the largest class in its history, and four others showed smaller gains, but the average for the entire group was a loss of about 25 per cent.

Expressed not in percentages, but in actual numbers, the data are even more striking. For the institutions available the freshmen aggregated in 1916, 4,630, and in 1917 only 3,463. This means a decrease of 1,167 freshmen students in agriculture in the 41 States reporting this item.

Another problem before the land-grant colleges to-day is the provision of special courses to meet the emergency needs. Thus, as regards the training of teachers, at the outbreak of the war there were upwards of 1,000 college trained young men teaching agriculture in schools below college grade, the number has now been seriously depleted, while the development of work under the Smith-Hughes Act alone has created a demand for several hundred additional instructors with such training. It is suggested that the colleges can do much to "prevent the serious lowering of standards by increasing their facilities for training undergraduates for the teaching profession, by conducting emergency courses for teachers now in service, and by the intensive training along agricultural lines of college graduates in arts and science courses."

Emergency short courses in agriculture have already been offered by a number of institutions and their further development seems logical.

The committee on instruction in agriculture of the Association of American Agricultural Colleges and Experiment Stations was of the opinion that not within a decade "has there been a time so favorable for giving serious attention to measures for improving the

quality of teaching in the colleges themselves as the present war emergency affords."

If the reduction in enrollment of agricultural students by nearly one-third seems discouraging, it is well to reflect that in England wholesale losses of faculties and students have occurred, that several institutions have closed their doors, and that others have been very seriously restricted in their operations. In our own country no such developments are expected and often the enrollment is far in excess of that of a few years ago. When the importance of trained agricultural leadership becomes thoroughly realized, particularly in its relations to the existing emergency, there need be little doubt that the agricultural colleges, as the training ground for such leadership, will receive and retain the full support in every direction which they will need for this vital service.

#### BUILDINGS.

The new Hilgard Hall at the University of California is an elaborate four-story structure, of reinforced concrete, 60 by 300 feet, costing with equipment about \$370,000, and constituting the second of the three buildings which will complete the agricultural quadrangle. It will serve as the headquarters of the college of agriculture, housing the departments of agronomy, citriculture, forestry, genetics, pomology, soil technology, and viticulture.

The new animal-husbandry laboratory at the Iowa State Agricultural College has been completed. It is a one-story building 74 by 112 feet, costing about \$50,000. It has been devised especially for work in connection with the slaughtering, dressing, cutting, and curing of meats. The basement contains a 10-ton refrigerating plant, coolers, a smokehouse, refining, sausage, lard, and other by-product rooms, offices, etc. The main floor can be divided into three distinct rooms, or used as a whole for demonstration work.

The new beef-cattle barn at the University of Minnesota, to replace the structure burned, is practically completed. It is 60 by 120 feet with a wing 36 by 120 feet. The portion to be used as a stable is built of hollow tiles with reinforced concrete. Two hollow-tile silos adjoin the stable, and the wing contains a laboratory for class work and demonstration. The total cost is about \$25,000.

A two-story institute hall has been completed at the Duluth substation. The first floor contains an auditorium and office space, and the second dormitory accommodations, a kitchen, and a dining room. The new equipment will make possible the holding of community gatherings at the substation, as well as afford a meeting place for various farm organizations of northeastern Minnesota.

Wolf Hall, the new \$280,000 building at Delaware College, will house all the activities of the agricultural department and temporarily the college departments of chemistry and biology.

Plans have been approved by the building committee for the new agricultural building at the Maryland State Agricultural College. The legislature has appropriated \$175,000 for the construction of this building, which will be a three-story and basement structure with a front wing 200 by 68 feet connected with an inclosed bridge with an auditorium seating about 1,000 people and this in turn connected with a rear wing with the same dimensions as the front.

A plant for the curing and drying of meat is to be erected on the New Jersey State Agricultural College farm. The structure will consist of two fireproof and two waterproof compartments, one to be used for the slaughtering of animals and the other for the curing and storing of meat. There will also be a small compartment for smoking meats. This plant will provide facilities for instructing students in the long and short courses in agriculture in home butchering, which will be given due attention as a part of the campaign for the conservation of foodstuffs.

Substantial progress is being made in the construction of a new \$100,000 administration building, auditorium, and museum at the New York State College of Agriculture.

The Oklahoma Agricultural College and station has recently completed a modern two-story grain storage house. The upper story will be used for laboratory work in plant breeding, seed selection, etc. The lower floor has six rooms, three of them designed for storage rooms for small grains and equipped with special appliances for fumigation, and the remainder are designed for a general receiving and work room, a machine room for the graders, ginners, etc., and a general storage room, respectively.

#### APPROPRIATIONS.

A State appropriation in Alabama of \$100 per annum for the years 1915-1918, inclusive, is now available for each county that raises a similar sum to be used for prizes, premiums, and other phases of boys' and girls' club work. These funds are spent under the joint supervision of the State board of agriculture and the county authorities under plans and rules submitted by the professor of school agriculture of the Alabama Polytechnic Institute.

The Arkansas Legislature for 1917 appropriated \$481,000 for the ensuing biennium for the divisions of liberal arts, agriculture, engineering, and education. This is an increase of approximately 50 per cent over any previous appropriation.

The Connecticut General Assembly of 1917 appropriated \$28,000 for the construction of a central heating plant at the State agricultural college, and added \$2,500 per year to the maintenance appropriation of the station. Other appropriations for the biennium included \$12,000 for the State entomologist, \$40,000 for the suppres-

sion of gipsy and brown-tail moths and nursery inspection, and \$15,000 for the control of white pine blister rust.

A law passed by the Montana Legislature in 1917 appropriated \$10,000 for the reimbursement of the cost of transportation to and from their homes of students at the State agricultural college, the State university, the State school of mines, and the State normal college. The purpose of the act is to equalize the cost of attendance at these institutions to students coming from distant parts of the State.

The Delaware Legislature appropriated in 1917 a total of \$285,890.27 to the State agricultural college for the ensuing biennium. Among the items authorized were \$125,000 for the new dormitory at the women's college, \$32,000 per annum for the maintenance of that college, \$32,000 for a new heating plant, \$10,000 per annum for the maintenance of the agricultural department, \$7,890.27 for agricultural extension. Gifts made to the college from an unannounced donor during 1916 amounted to \$1,000,000 and are being utilized largely for buildings.

The Kansas Legislature for 1917 appropriated to the State agricultural college \$80,000 for the purchase of land to be used for animal husbandary, dairy, and poultry farms, and \$50,000 for an addition to the agricultural building.

The Massachusetts Legislature for 1917 appropriated to the State agricultural college \$40,000 to enlarge the power plant, \$33,000 additional for new equipment, and \$10,000 for maintenance and improvement of the market garden substation at Lexington.

In 1917 the New York State Legislature appropriated \$779,401 for the State agricultural college for the ensuing year, in addition to an earlier emergency grant of \$55,910 for the present year and \$42,000 for printing.

A bill appropriating 125,000 pesos (\$62,500) for the establishment of an experiment station in connection with the college of agriculture, was passed by the Philippine House of Representatives at its 1917 legislature.

The Porto Rico Legislature at its last session appropriated \$1,000,000 for aid in the growing of food crops. In 1917 about 40 rural teachers were engaged in all sections of the island.

A bond issue of \$1,000,000 was authorized by the Tennessee State Legislature in 1917 for buildings and other improvements by the State university, supplemented by the proceeds of the half-mill tax, estimated to produce about \$336,000 per annum at present and to be used for maintenance. About \$100,000 may be used for the construction of buildings at a substation in middle Tennessee.

The Texas Legislature for 1917 established the West Texas Agricultural and Mechanical College on a grade coordinate with the existing institution at College Station, as well as a junior college located

elsewhere to give two years of high-school agriculture and two years corresponding to the freshman and sophomore years of college work. Provision has also been made by the legislature for establishing a third junior agricultural college to be known as the Northeast Texas Agricultural College. An appropriation of \$250,000 has been made for its establishment and maintenance. Special appropriations were made for the station and substations, aggregating \$225,095.34 for the year beginning September 1, 1917, and \$181,270.40 for the following year.

The 1917 legislature of West Virginia granted an additional \$75,000 for the agricultural building. The legislature also appropriated \$20,000 for buildings on the new farms.

#### EXTENSION AND SHORT COURSES.

Special instruction courses for extension workers were held in December at the University of Arkansas, and a course specially designed to meet the needs of home demonstration agents, including English, gardening, dairying, rural sociology, poultry work, rural social engineering, household conveniences, rural recreation, sanitation, home nursing, care of infants, etc., from January 7 to February 2, 1918.

Four-year professional courses in forestry and forest engineering have recently been established at the University of California. A 12-weeks short course was also given, beginning January 15, 1917, to help practical woodsmen. The work included theoretical training in surveying, log scaling, timber estimating, logging, fire protection, silviculture, forest administration, trail and telephone construction, English composition, grazing, and the work of the United States Forest Service.

A feature of the annual short course in January at the Georgia State Agricultural College was the food-conservation school for farm women. County demonstration and home economics agents who have recently taken up work in the extension departments were also present at these courses.

A four-weeks course in dairying has been offered at Purdue University to women preparing themselves to fill positions in factories manufacturing dairy products. This course included the testing of milk and dairy products, the making of soft cheese and ice cream, dairy bacteriology, general dairying, and lectures on food production.

A special short course was arranged at the Iowa State Agricultural College in November, 1917. This course included instruction in agriculture, home economics, engineering, and industrial science, and was open to young people who have not yet completed high-school work as well as to those prepared for full collegiate instruction.

Evening courses in various branches of agriculture were offered in 1917 at the Maryland State Agricultural College. These courses included special work in beekeeping, poultry raising, and fruit growing for suburban residents of Washington, D. C. College credit was given for these courses so far as practicable, with a system of certificates showing all work completed.

The Annual Farmers' Convention, held at the North Carolina Agricultural College and Station, in August, 1916, under the auspices of the college, station, and extension workers, was one of the most successful meetings of its kind yet held in the State. About 3,000 men and 2,000 women were in attendance. The special subject of the meeting was rural education, which was graphically presented by means of an exhibition in which several booths were grouped around a larger booth in one of the college buildings. The smaller booths represented the activities of the station and extension service, while the larger booth represented a consolidated or farm-life school.

A school of education has been organized at the North Dakota State Agricultural College with four courses covering four years and two courses covering two years for completion. The four-year curricula are designed for teachers of agriculture, the mechanic arts, science, and vocational and rural school administration, while the two-year curricula are for teachers in consolidated schools and special teachers.

#### THE GRADUATE SCHOOL OF AGRICULTURE.

The seventh session of the Graduate School of Agriculture, under the auspices of the Association of American Agricultural Colleges and Experiment Stations, was held July 3-28, 1916, at the Massachusetts Agricultural College. The attempt was made to develop a more systematically organized plan of work at this session than had hitherto been undertaken. This plan involved work in two main lines. One of these included progressive consideration of the fundamental factors involved in the growth of plants and animals. The other dealt with the economic and social factors which enter into the development of profitable systems of agriculture and well-organized rural communities.

At its public opening exercises the school was welcomed to the Massachusetts Agricultural College by President K. L. Butterfield, and the granges of New England were represented by Rev. J. H. Hoyt. Dean A. C. True, of the graduate school, outlined briefly the objects for which the school was established, the reasons for the particular courses of instruction offered at the seventh session, and the intellectual and social advantages to be derived from the contact of instructors and students in such a school.

Dr. True pointed out that in our time

education and research more and more involve the harmonious working together of groups of individuals who are willing to put away selfish ends for

the common good. In a vast country like our own with a population drawn from all quarters of the globe, and with an almost infinite variety of environmental conditions, associations of scholars and investigators from many different regions, whether their work deals with subjects remote from practical affairs or, as in the case of most of us, with matters of vital concern to great industries, is of great importance as an aid to that mutual understanding on which the life of our Nation and the perfecting of our civilization depend. For after all, as recent events in the world's history have shown, public opinion and governmental action depend more largely than is generally recognized on the modes of thought which are developed in the institutions of higher learning.

Such an organization as this graduate school, having behind it the associated universities and colleges represented in the Association of American Agricultural Colleges and Experiment Stations, may also be influential in shaping the ideals and standards of agricultural scholarship and research. If through our discussions here we are able to carry back to our respective institutions suggestions for the improvement of courses of instruction and methods of research and to stimulate faculties and students to more thorough work, we shall have made a valuable contribution to those influences which are to determine the success of the great movement to raise American agriculture and country life to the highest possible level.

Since the last session of our school this movement has made unusually rapid progress. The permanent national system of agricultural extension education, provided for in the Smith-Lever Act of 1914, has already become well organized and attained great dimensions. In over 1,200 counties, spread over the entire country, extension agents are regularly working. Supporting these local forces are about 1,500 extension-specialists and administrative officers maintained by the State colleges and the Department of Agriculture. At least 1,000 teachers are giving instruction in agricultural subjects in our colleges, and the number of students in four-year courses of agriculture has risen from 14,000 in 1913 to 19,500 in 1915. The past year 4,300 secondary schools gave agricultural courses attended by 95,000 students, as compared with 1,400 schools and 30,000 students two years before. The force employed in our agricultural experiment stations has risen to 1,800 and the income of the stations in 1915 was \$5,286,000. The force employed in the Department of Agriculture is over 16,000 and its income about \$25,000,000.

The demand for thoroughly trained and efficient workers in agricultural lines, whether in research, education, or farm practice, has never before run so far beyond the supply. The responsibilities of the leaders in the agricultural movement have never been so heavy. Their encouragements have never been so great. This body of young men, who have already been trained in our higher institutions of learning and many of whom are already engaged in teaching or research, have before them exceptional opportunities for leadership and high success. The incentives to thorough preparation and the most strenuous endeavor are of the highest and broadest character. To discover nature's secrets and thereby advance science and human welfare, to inspire and instruct a vast multitude of men, women, and children in colleges, schools, and millions of homes, to lay a firm and safe foundation for the permanent existence and prosperity of the United States and in large measure of all the world—these are the appropriate tasks of agricultural scholars and scientists.

A week was devoted to discussions of the problems of education with special reference to the training of students along agricultural lines. Dr. W. C. Bagley, director of the school of education of the University of Illinois, gave five lectures on the foundations of peda-

gogy. He argued that not only knowledge but "skill" is a legitimate and important end of education, whether the subject taught is what is ordinarily called cultural, such as language and mathematics, or technical, as engineering and agriculture. The interrelations of technical and cultural aims in education were also dwelt upon. A clear and impartial résumé of the experimental researches on the disciplinary value of various studies was given, with the conclusion that the evidence thus far accumulated indicates that there is a certain disciplinary result which may be transferred from one study to another, but that this is not so large as has been commonly held by the friends of the old classical education.

Dean W. W. Charters, of the school of education of the University of Missouri, presented some of the principles on which methods of teaching should rest. He laid special stress on the principle that the normal mental process in learning is to work from problems toward their solution. A problem arising in the experience of the student or being presented to him by his teacher, the learner may become in large degree his own instructor, especially if the solution is of vital interest to him. The application of this principle would in many subjects result in economy of mental effort, increase of interest, and more permanent results. Good method should always culminate in elaborated and well-organized knowledge.

At the seminars the practices of teaching various agricultural subjects were presented by Dean R. L. Watts, of Pennsylvania State College, on vegetable gardening; Prof. C. G. Woodbury, of Purdue University, on pomology; Prof. C. A. Zavitz, of Ontario Agricultural College, on agronomy; and Prof. J. E. Rice, of Cornell University, on poultry husbandry, as well as by members of the Massachusetts College faculty and others. On Saturday a conference on the training of men for agricultural service was led by President H. J. Waters, of the Kansas Agricultural College, who dwelt on the nature and function of the college course in its adaptation to this end, and by Prof. G. A. Works, of Cornell University, who discussed the relation of the agricultural college to the preparation of teachers of agriculture in secondary schools.

The conference was followed by a round-table discussion by teachers of secondary agriculture on the value of the college courses in agricultural education as a means of preparation for teaching agriculture, this meeting being one of the series of conferences held during the past year through the cooperation of the United States Bureau of Education and the States Relations Service. During this educational week emphasis was often laid on the importance of training in the principles and methods of education for students intending to become teachers of agricultural subjects in colleges or schools.