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DEVELOPMENT OF
AGRICULTURAL INSTRUCTION IN
SECONDARY SCHOOLS

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PREFATORY STATEMENT.

This bulletin represents a thesis presented by the late Harry Percy Barrows to the faculty of George Washington University in 1919 for the degree of doctor of philosophy. It furnishes an historic record that should be very helpful in the future development of instruction in agriculture in this country. Since secondary instruction in agriculture was developed first in the institutions that later became the colleges of agriculture, this paper covers in a masterly way the early development of collegiate agriculture.

Soon after the manuscript for this bulletin was presented for publication the author suffered a severe attack of influenza, which was followed by pneumonia and later resulted in his death at Berkeley, Calif., May 3, 1920. It should be understood, therefore, that the author was not permitted to examine the printer's proof nor to make such changes in the text as frequently suggest themselves upon reading the printed copy.

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July 15, 1920.

DEVELOPMENT OF AGRICULTURAL INSTRUCTION IN SECONDARY SCHOOLS.

Chapter I.

HISTORY OF AGRICULTURE IN SECONDARY SCHOOLS.

EARLY DEVELOPMENT.

Lines not clearly drawn.—It is not easy to trace the development of agriculture in the secondary or high schools as such, because in the earlier days of our educational history distinctions were not made between elementary, secondary, and collegiate instruction as they are made now. The development of much of the agricultural instruction in the agricultural colleges should be classed as secondary agriculture when judged by present-day standards. In establishing the land-grant colleges there was not so much the intention to establish schools of college rank as to give some direct aid to the farmers. The discussions of the Morrill bill in Congress bring out the fact that many of those who voted for it did not realize that they were voting to establish colleges, just as some of the Members of Congress who voted for the Smith-Hughes Act thought they were voting to aid the elementary schools. A consideration of the early development of secondary agriculture must be of necessity a review of the general effort to improve agriculture by means of education.

Agricultural societies.—Probably the first organized effort to improve agriculture was by means of agricultural societies and fairs. George Washington and Benjamin Franklin were members of the first society for the promotion of agriculture, which was organized in Philadelphia in 1775. About the same time a similar society was organized in South Carolina, which proposed, among other things, to establish the first experimental farm in the United States. In 1792 a small volume representing the transactions of the New York Society for the Promotion of Agriculture was published. This society, organized in 1791, was followed by a similar organization in Connecticut in 1794.

The establishment of fairs and exhibits was an outgrowth of the work of the agricultural societies and the desire of men going to ex-

¹ See Dabney, C. W., *Agricultural education*. In Monograph No. 12. Butler's Monographs in Education. New York, American Book Co., 1910. Pp. 5-8.

pense in importing improved types of farm animals from Europe, to exhibit their importations. The first fair was held in Massachusetts in 1804. In 1809 the Columbian Agricultural Society, composed mostly of farmers in Maryland and Virginia in the vicinity of the National Capital, was organized to further agriculture by means of fairs.

From the beginning the various State and local agricultural societies and fair associations have been strong factors in the direct improvement of agriculture and in securing additional means for improving the lot of the farmer. There have been, however, several movements of a national nature, which have had a wide-spreading influence. Most notable of these are the National Grange (Patrons of Husbandry), organized in 1867, and becoming a national society in 1873, and the Farmers' Alliance. While these organizations spread their influence chiefly in the North and West, their place was filled in the South by such organizations as the Brothers of Freedom and the Farmers' Educational and Cooperative Union.

Many of the societies have been instrumental in securing national and State aid for the promotion of agricultural instruction in the schools.

*Development of the land-grant colleges.*¹—The first proposal to have the Federal Government aid in the training of farmers was made by Representative Justin S. Morrill, of Vermont, in 1857. Due to the able plea of Mr. Morrill in behalf of the farmer, and to his skill in parliamentary procedure, the bill passed the House by a narrow majority, but was held up in the Senate. The bill finally passed both House and Senate in 1859, only to be vetoed by President Buchanan. Soon after the Thirty-seventh Congress met, in December, 1861, the bill was again introduced and finally passed both Houses. On July 2, 1862, President Lincoln signed the bill which has been since known as the Morrill Act.

This act provided for Federal aid as a stimulus to State aid in establishing colleges of agriculture and mechanic arts. Inasmuch as the Federal aid given was in the form of grants of public land, the institutions established have become known as the land-grant colleges.

Agricultural colleges had already been established in the following States: New York, Pennsylvania, Michigan, Connecticut, and Maryland, before the land-grant act was passed. In other States, notably Kansas, Iowa, Wisconsin, Massachusetts, and New Hampshire, departments of agriculture were established in connection with existing institutions, which departments afterwards developed into colleges which secured the benefit of the land-grant act. Such institutions

¹ See Kandel, I. L., Federal Aid for Vocational Education. Carnegie Foundation for the Advancement of Teaching. Bulletin No. 10, 1917. Pp. 3-58.

as Harvard, Yale, and the Universities of Virginia and Georgia made some advancement in agriculture as a science before the Federal-aided agricultural colleges were established.

The act of 1862 was soon accepted by the legislatures of the States then loyal to the Federal Government, and, after the war, it was extended to and accepted by the States out of the Union during the war. Many of the colleges established were not colleges when judged by present-day standards for other lines. They were not strictly agricultural and mechanical colleges in that they did not confine their work to the training of farmers and mechanics. A perusal of the curricula of those colleges of earlier days shows that some of them did not approach very closely to practical agricultural training. Nevertheless, they performed a needed function in extending public education of a more or less special nature to a greater number of the common people, performing for a relatively small number the function performed now by rural high schools to great numbers of farm boys and girls. Yet a relatively large number did not receive training in agriculture and did not return to the farm, hence in a large measure these institutions failed in filling the mission for which they were established. The fact that they were appreciated, however, is shown by the increased appropriations made for these institutions. No sooner had the colleges become established than Senator Morrill and his colleagues began a campaign for additional funds. Their efforts were unsuccessful, however, until 1890, when the so-called second Morrill Act was passed. This act provided for each college then established an additional sum of \$15,000 for that year and an annual increase of that amount thereafter of \$1,000 until the annual appropriation should reach \$25,000 for each State. These funds were further supplemented in 1908 by what is known as the Nelson amendment, which provided for an additional sum of \$15,000 to be given that year and additional sums of \$5,000 for four succeeding years; united, the total appropriation from the Federal Government would be \$50,000 each year.

The agricultural experiment stations.—At the time several of the first agricultural colleges were established provision was made for investigational work to go hand in hand with the instruction of students. The act providing for the establishment of the Maryland Agricultural College also provided that the college should establish a model farm upon which a series of experiments might be conducted. It may be remembered that the early settlers of this country spent a great deal of time and effort as individuals in attempting to secure crops suited to the New World. They were very willing to let the State do this work. A great deal of the foundation for real investigational work was done by Dr. Samuel W. Johnson, who was ap-

pointed professor of agricultural chemistry in Yale. Many of the early leaders in research in agricultural science were Dr. Johnson's students.

Although many of the States established experiment stations in connection with the agricultural colleges, the greatest impetus was given this movement by the passage of the Hatch Act in 1887. This act provided \$15,000 each year of funds from the sale of public lands toward the establishment and support of an agricultural experiment station in each State.

The Hatch fund was supplemented further in 1906, by the passage of the Adams Act. This act appropriated an annual sum of \$5,000, with an increase of \$2,000 each year until the total sum per year should be \$30,000 for each State. The individual States now appropriate more money each year than does the National Government for research work.

*The United States Department of Agriculture.*¹—George Washington, as President, favored congressional aid for agriculture, and so recommended it, but Congress at that time did nothing by way of direct aid for the farmer. In 1836 the Patent Commissioner, Henry L. Ellsworth, received a considerable quantity of seeds and plants from representatives of the Government abroad and distributed them to progressive farmers in this country. Although this work was begun without authority or financial aid, it led to an appropriation of \$1,000, made for such purpose in 1839. The Patent Office soon began collecting and disseminating statistics and other information as well as seeds. The work grew in this office until, in 1862, the same year the agricultural colleges were established, a separate department was organized, with a commissioner of agriculture at its head. In 1889 this department was raised to the first rank in the executive branch of the Government, and was put under the direction of a Secretary of Agriculture, a Cabinet member.

The Department of Agriculture in its phenomenal growth has without doubt branched out into lines of work undreamed of by those who worked so hard for its establishment. Its work is chiefly along three lines, viz: Research, regulatory supervision, and direct instruction. From the beginning the department has done a great deal in the way of directing investigation as well as to direct the agricultural research carried on in the States with Federal funds. As Government control of agricultural production and marketing has increased, the police duties of the department have been added upon. Through direct contact of its corps of trained specialists and by extensive correspondence and publications, the department has

¹ See Greathouse, C. R. Historical Sketch of the United States Department of Agriculture. U. S. Department of Agriculture, Division of Publications. Bulletin 3, 2d Rev., 1907.

aided the agricultural colleges in the direct education of the people. It has done a great deal to aid the colleges and schools of lower grade in their problems of instruction as well as research.

Agricultural extension work.—Largely as a result of the work of the experiment stations and the Department of Agriculture, a beginning was made in this country toward developing agriculture as a science. A great mass of scientific material pertaining to agriculture has been accumulated, while the most valuable resources of the country were being wasted by poor methods of farming. The agricultural colleges reached a relatively small number of students, and a large percentage of them did not return to the farm. Early in the history of the colleges, however, an effort was made to take their information directly to the farmer. Farmers' institutes¹ developed along with agricultural societies and fairs. It became evident in time that a more comprehensive program and a better organized plan were essential in reaching the men and women on the farm. Once again Federal aid was sought and secured in what is known as the Smith-Lever Act. This act, passed in 1914, provides for Federal aid to State agricultural colleges for agricultural extension work in co-operation with the United States Department of Agriculture. The money was not to be spent upon resident instruction, but provided for various means of instruction away from the college. At the beginning \$10,000 for each State was appropriated, a total of \$180,000. This sum increases year by year until an annual appropriation of \$4,100,000 is reached. This sum is divided among the States in the proportion that rural populations bear to the entire rural population of the country. The States must meet the Federal appropriation, dollar for dollar.

Inasmuch as this extension work has reached a large number of people and has secured direct results, it has been on the whole very well received. In the extension service an organization has been effected under the direction of the Department of Agriculture through which additional funds may be spent effectively as a war measure in increasing efficiency in the production and consumption of food.

It has been the experience of many extension workers in agriculture and home economics that time and money were more effectively spent upon boys and girls than upon mature farmers and their wives. In many cases it was found to be easier to reach the fathers and mothers through the boys and girls; hence the boys' and girls' club movement and other forms of extension work among young people have been given an increasing amount of attention. There is a strong tendency at the present time to link such work as closely as possible with the public school system.

¹ See History and Status of Farmers' Institutes in the United States and Canada. U. S. Department of Agriculture. Office of Experiment Stations. Bulletin 79.

SECONDARY SCHOOLS OF AGRICULTURE.

Schools affiliated with agricultural colleges.—Attention has been called to the fact that lines have not been closely drawn between agriculture of a secondary grade and collegiate agriculture in the land-grant colleges. Some of the institutions, however, have seen fit to draw the line closely from the standpoint of administration and have organized secondary schools and colleges in the same institution. Minnesota established the first school of agriculture in 1888. This school was established on the campus of the college of agriculture, which is a part of the State university, at St. Anthony Park, between Minneapolis and St. Paul. Although the buildings, equipment, and faculty of the agricultural college are used in the instruction of the secondary students, the school is maintained as a separate institution. Almost from the beginning the school has been successful and popular. It has furnished the people of Minnesota the type of education they have demanded to the extent that until very recently it has overshadowed the college of agriculture in the same institution. Although Minnesota established a similar school at Crookston in 1908 and another one at Norris in 1910, there has been a demand for secondary agriculture in the high schools of Minnesota unequalled in any other State.

Following the lead of Minnesota, in 1896 Nebraska organized a similar school in connection with the college of agriculture of the State university at Lincoln. Over half of the States have since organized special schools in connection with the agricultural colleges. In some States these schools use the same equipment and teaching force as the college, following the example of the first school organized in Minnesota. In other States the schools have a separate organization in a different part of the State. Such is the case in California at the University Farm School at Davis. This school, however, serves the university proper, in giving the courses which demand farm practice to students of college grade in addition to giving courses of a secondary grade.

District and county agricultural schools.—The independent schools of agriculture established through State aid may be classed largely as county schools and district schools. The districts served, however, vary from the congressional district to an indeterminate district which means that the school may serve the State at large.

Alabama was the first State to establish a system of agricultural schools. In 1889 the State provided for a school in each of the nine congressional districts. At each school a branch experiment station was established under the direction of the State College of Agriculture. Although these schools have not given courses of a distinctly vocational nature, they have furnished some practical

work along with an academic training to a great number of young people who otherwise would not have received instruction beyond the elementary school.

Following the lead of her sister State, Georgia established agricultural schools in each of her 11 congressional districts in 1906. These schools have had much the same service as those in Alabama. Wherever they have been in charge of agricultural men there has been a strong leaning toward agricultural education, but in a number of cases the term "agricultural school" has been a misnomer, as practical agriculture has been subordinated to academic work. This criticism applies even more strongly to the congressional district agricultural schools established in Virginia in 1908. In most cases these schools have been very weak agricultural departments added to ordinary high schools, which until very recently have made little attempt to adapt their curricula to the needs of the rural community.

In 1909 Arkansas established four agricultural schools, each to serve a district comprising approximately one-fourth of the State. These schools were established upon a bigger, broader basis than the schools which serve a smaller district in other Southern States. They have been from the beginning more nearly real agricultural schools than any of the special schools of agriculture in the South. They have become ambitious in the growth, however, and at times there appears a rivalry between these schools and the State college of agriculture. Oklahoma also established schools to serve a large district, but as these schools have not had the support given the Arkansas schools, they have not prospered so well.

Wisconsin led out in the county agricultural school idea in 1901, when funds were provided for county schools of agriculture and domestic economy at Wausau and Menomonie. Since then such schools have been established in many other counties. County agricultural schools have later been established in several States.

The following States have established schools to serve the State at large or an indeterminate district: California, New York, Nebraska, Vermont, Colorado, and Pennsylvania. In Nebraska the State agricultural school at Curtis has definite connection with the State university. The State agricultural school at Fort Lewis, Colo., is also a part of the State agricultural college. In California, while the university farm school at Davis is a definite part of the State university, the California Polytechnic School at San Luis Obispo is an independent State institution.

Public high schools.—Although it is a relatively simple matter to trace the development of agricultural schools as such, it is very difficult to secure definite and accurate information concerning agri-

culture as taught in the ordinary high schools. The instruction may vary from the application of courses in botany or chemistry in the direction of agriculture, or the use of an elementary textbook for a portion of a year, to the full-fledged department of agriculture giving a four years' course, taking more than half of the entire time of the student. In some cases these departments employ more than one teacher, have better equipment and offer more complete courses than so-called agricultural schools. One of the marked tendencies in recent progress in agricultural education is the getting away from the idea that a consideration of secondary agriculture is necessarily a consideration of a special school of agriculture. Classifications of institutions into agricultural courses may mean little as to the nature and extent of the agriculture taught. Agriculture has not dominated in the curriculum of the majority of secondary agricultural schools established in the past. A mere statistical study may have some value in showing progress made, but it will need a great deal of explanation based upon first-hand study to show the real nature of the work given.

A few years ago there was a tendency to judge the progress in agricultural education by the number of institutions offering courses and the number of students taking the work. While much of the superficial teaching which went under the name of agricultural instruction has been eliminated and real progress made in the character of the work given, the apparent decline in interest shown in the following statistics is due largely to a more careful inquiry into work reported as agriculture.

The following is from the report of the Commissioner of Education for the year ending June 30, 1913:¹

According to the most reliable information obtainable there were about 2,300 high schools in the United States teaching agriculture in 1912-13. This indicates an increase of about 300 over the previous year. This number includes 47 State agricultural schools, 40 district agricultural schools, 67 county agricultural schools, 18 agricultural departments of high schools, and the remaining ordinary schools giving courses in agriculture.

The following tables were compiled from reports made to the Commissioner of Education showing the progress in the next two years:

Report for 1914.

Institutions.	Courses.	Schools reporting.	Number of students.		
			Boys.	Girls.	Total.
Public high schools.....	Agriculture.....	1,853	21,702	10,319	32,021
Private high schools.....	do.....	124	1,767	579	2,346
Total.....	.....	1,877	23,469	10,898	31,367

¹ Chapter IX, Progress of Agricultural Education, pp. 213-214.

Report for 1915.

Institutions.	Courses.	Schools reporting.	Number of students.		
			Boys.	Girls.	Total.
Public high schools.....	Agriculture.....	4,665	51,677	39,031	90,708
Private high schools.....	do.....	253	2,579	1,861	4,440
Total.....		4,918	54,256	40,892	95,148

These statistics were compiled from general data sent by the schools to the Bureau of Education. In the spring of 1916 the bureau attempted to gather more complete and definite information concerning the teaching of agriculture in the public high schools and in special agricultural schools of secondary grade. The following is a brief summary of the schools reporting:¹

Agriculture in secondary schools, 1915-16.

Number of public high schools reporting teaching agriculture.....	2,175
Established before 1901.....	19
Established from 1901 to 1905.....	83
Established from 1906 to 1910.....	413
Established since 1910.....	1,710
Reporting teaching agriculture primarily:	
As informational subject.....	1,521
As vocational subject.....	566
Number of persons teaching agriculture:	
Male.....	2,007
Female.....	247
Number of these with any special training in agriculture, including those with full four-year agricultural college courses, short-term courses, normal school agricultural courses, summer courses, etc.....	1,021
Number of students of secondary grade studying agriculture:	
Boys.....	24,743
Girls.....	16,312
Number of schools using school land for instructional purposes.....	392
Number teaching through home-project method.....	837
Number in which instruction consists wholly of classroom work.....	416
Number in which instruction consists of classroom work, with laboratory exercises and observation on neighboring farms.....	1,064
Number of special secondary agricultural schools supported in whole or in part by the States.....	68
Total cost of maintenance.....	\$766,000
Total number of teachers:	
Male.....	276
Female.....	140

¹ From Report of Commissioner of Education for the year ended June 30, 1916, pp. 237-38.

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Total number of pupils:

Elementary—

Male ----- 615

Female ----- 464

Secondary—

Male ----- 3,893

Female ----- 2,408

This summary does not include special schools of agriculture maintained by the State colleges of agriculture on the college campus.¹ Schools of this type are maintained by the State agricultural colleges of California, Colorado, Idaho, Kansas, Mississippi, Nebraska, Montana, North Carolina, North Dakota, and Washington (school of science). Agricultural courses of secondary grade are given to special students in 20 other State colleges of agriculture.

In a publication¹ which gives the final returns from this investigation, 2,981 public high schools are reported as giving instruction in agriculture in 1915-16. Of these, 2,250 schools gave information as to the character of the work given. Only 2,166 of this number, however, were really teaching agriculture in a serious way. To understand the nature of the agriculture taught in these schools, we may consider the following facts:

(1) Date of introduction: Less than 1 per cent of these schools taught agriculture before 1900, and less than 1½ per cent introduced the subject between 1900 and 1905. Over 97.6 per cent of the schools introduced the subject since 1905, and 78.5 per cent since 1910.

(2) Nature of instruction: The schools were asked to indicate whether they were teaching agriculture with a vocational aim as definite preparation for farming, as information about agriculture, or for general cultural purposes. As many of the schools reported that they were teaching agriculture for two or all three reasons, it is evident that they did not have a distinct purpose in their instruction. Although 25 per cent of the schools reported the chief aim as being vocational, the character of the work indicates that many of the teachers have little conception of the meaning of vocational training. The instruction in many cases was confined to classroom only, or supplemented with some laboratory work. Some teachers thought their textbook instruction was vocational, as their students lived on farms. The summary of replies shows that 20 per cent of the schools confined their instruction to classroom work; 50 per cent supplement the classroom instruction with laboratory exercises and observation trips to the farms; and only 30 per cent combine classroom instruction and laboratory work with practical

¹ Monahan, A. C., and Dye, C. H. Institutions in the United States giving instruction in Agriculture, 1915-16. Bureau of Education. Bulletin, 1917, No. 34.

farm work. Three hundred and thirty-seven were using the home-project plan, although in only 261 schools was the home work given supervision by the instructor in agriculture. The schools reporting, however, did not include many of the State-aided schools which are using this plan. Eighteen per cent of the schools reported school land for agricultural purposes. Of these schools 134, or about one-third of the number, had less than two acres.

(3) Training of teachers: There is a close relation between the nature of the instruction and the training of the teachers. Only 15 per cent of the teachers in the 2,166 reporting were graduates of agricultural colleges. In addition to these, 21 per cent had some training in agriculture in colleges or normal schools. In some cases this work was taken only in summer school or as short winter courses.

Private high schools.—Since the time that secondary schools were first developed in this country many of these schools have been organized outside the city with private funds. At such of these schools as have owned farms upon which students have lived away from home there has been more or less direct relation between the instruction of the school and farm life. Definite instruction in agriculture was inaugurated in a few of these schools before it was attempted in the public high schools. In a few cases the agricultural instruction has been of a vocational character from the beginning, as the instruction has been based largely upon the work of the farm. In placing the agriculture of our public schools now upon a vocational basis we may learn much from these private schools which have been working for a number of years upon problems connected with the use of land in agricultural instruction. We have learned considerable from such schools as the National Farm School, at Doylestown, Pa., the Baron de Hirsch School, at Woodbine, N. J., and the Berry School, near Rome, Ga. Where these schools have had a real vocational aim they have had a decided advantage in making their work practical, as the students are living on the school farm throughout the year.

It is very difficult to secure accurate statistics concerning private schools and especially to grade the work done. Although a number of private colleges and State institutions other than the Federal-aided colleges are giving courses in agriculture, in few cases is the instruction given of more than secondary grade when judged by the standards of the land-grant colleges. As the equipment and instruction for college agriculture is so expensive, few colleges attempt to compete with the Federal-aided institutions in college courses. Only 18 of these colleges and 160 secondary schools reported the nature of the work to the Bureau of Education in

1916. These schools reported 3,393 students taking courses in agriculture. A number of schools having a relatively large number of students did not report the number of agricultural students.

Normal schools.—Normal-school training in agriculture is mostly associated with elementary agriculture, as in most cases it is training for elementary schools. Methods of teaching most subjects in normal schools are often superior to those used in the high schools. As the teaching of agriculture is not an exception to this rule, we may very well give some attention in pages to follow to normal-school instruction in this subject. At this time we shall consider briefly the development of normal-school instruction in agriculture in the United States.

Many of the States have made agriculture a required subject in rural schools without providing for special training of teachers in that line. As a result, agriculture as taught in many of the elementary schools was a very perfunctory perusal of a textbook which in most cases was adapted neither to the pupils nor the section in which they lived. To overcome this difficulty some States have required agriculture as a subject for examination for the teacher's certificate, others have made special effort to provide for the training of teachers, some have done both, as will be noted in the data following:

Legislative enactment has made the teaching of agriculture a requirement in all common schools, or at least in rural schools, in each of the following States: Alabama, Arkansas, Florida, Georgia, Indiana, Iowa, Louisiana, Mississippi, North Carolina, North Dakota, Ohio, Oklahoma, South Carolina, Texas, West Virginia, Wisconsin, and Wyoming. Agriculture is one of the subjects for examination for teachers' certificates in the following States: Alabama, Arkansas, California, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Louisiana, Michigan, North Dakota (alternative), Mississippi, Missouri, Nebraska, New Mexico, North Carolina, Ohio, Wisconsin, Oklahoma, South Carolina, Tennessee, Texas, Virginia (alternative), West Virginia and Wyoming. About half the States have had printed outlines of courses in elementary agriculture, prepared either by the State agricultural college or the State department of public instruction. Up to the present time approximately 75 texts in elementary agriculture have been prepared. But with all the aid given teachers in service, nothing has taken the place of specific training as a part of the teacher training course. The following will indicate that some States have sensed their duty in training teachers for rural schools: Maine, Oklahoma, and Tennessee require instruction in agriculture in all State normal schools. Instruction in agriculture is a requisite for State aid to normal training in the high schools of Iowa, Missouri,

and Nebraska. Nebraska also requires her normal schools to establish a course for rural teachers, including agriculture, household economy, and rural sociology. Kansas provides State aid for agricultural instruction in high school normal training classes, while elementary agriculture is required in the course of study in the county normal classes in Michigan, Nebraska, and Oregon.

In most cases the instruction involves subject matter only, and for the most part there is but one course in agriculture, and that is of an elementary nature. Some schools have been more recently paying more attention to the pedagogy of the subject and have been developing courses involving subject matter of a more specialized character. In a recent study¹ made by the United States Bureau of Education about half of the 114 schools reporting required agriculture of all students, the amount of required work ranging from only 20 hours, in the case of the New Jersey State Normal School, at Newark, to 190 hours required in the State normal school at Spearfish, S. Dak. The first district State normal school, at Kirksville, Mo., offered 1344 hours of agriculture. The author, having visited this school, can testify as to the high standard of the work offered.

As a rule the normal schools have confined their efforts to training teachers of elementary agriculture, but in a few cases the department of agriculture in connection with normal schools have become ambitious to compete with the agricultural colleges in training teachers for secondary schools. This has meant duplication of extensive farm and school equipment. In a few cases normal schools and agricultural colleges have cooperated in the training of secondary teachers, the normal schools or school of education given the professional training and the agricultural colleges the technical training.

Schools for Negroes and Indians.—It is difficult to classify schools for Negroes according to grade of work done. When measured by standards set for schools for white people, the colleges for Negroes give instruction in agriculture mostly of secondary grade. In 1915-16 there were 17 of these institutions with a total of 2,053 students taking regular four-year courses in agriculture. Ten of these institutions serve also as State normal schools. In addition to these schools, 67 other institutions for Negroes above elementary grade reported agriculture as a part of the curriculum and 43 reported courses in gardening. Much of the agriculture as well as gardening given in the secondary schools is of a decidedly elementary character. Although the classroom instruction of both colleges and secondary schools for Negroes may not measure up to standards for institutions for white people, in many cases the colored schools have led in the

¹ Institutions in the United States giving instruction in agriculture, 1915-16, U. S. Bureau of Education, Bulletin, 1917, No. 34, pp. 6-8.

amount and character of practical training given. This is especially true of such institutions as Hampton Normal and Industrial Institute at Hampton, Va., and Tuskegee Institute at Tuskegee, Ala. Although education has been unfortunately associated with the idea of emancipation from labor in the minds of many Negroes, in these institutions the industrial spirit predominates. Students who will not work are not allowed to remain at the school. Combining farming and industrial interests with the school, the students may work their way through school in a large measure, having work which fits well in the course of study pursued.

Established soon after the Civil War by Col. Armstrong, and since his death conducted until 1919 under the able leadership of the late Dr. H. B. Frissell, Hampton has been a wonderful factor in developing Negro leadership. It was in this institution that Booker T. Washington secured the inspiration and training which enabled him to develop at Tuskegee a larger one. In both institutions training for agriculture and the industries predominate. At Hampton the instructors are mostly white people, while at Tuskegee the teachers are of the colored race. At both institutions older students are used as assistants in the training of the younger ones. As an example of the practical and helpful character of the instruction given, the following account of a course in dairying at Hampton is given:

The well-equipped dairy is run as a commercial creamery making the butter used at the institution from milk obtained from two large dairy herds maintained by the school. There were 12 students in the class, each of whom was given two months' practical work in the creamery, one month as assistant and one month as foreman. As it took but two men to do the work, it was arranged for a new student to enter each month, so that the dairy was always in charge of a student with one month's experience. The student entering one month as assistant became foreman the next month when the man over him left. The plan worked well in developing initiative, resourcefulness, and self-confidence. The students interviewed felt competent to take charge of a small dairy when they left the school. The students in charge of the dairy at the time the school was visited in 1915 were both Indians.

There has been considerable development in vocational agriculture in some of the Indian schools maintained under direction of the Department of the Interior. Such schools as the United States Indian Industrial School at Carlisle, Pa., were given practical instruction in agriculture before public high schools were making very much progress in that direction. Recently the Bureau of Indian Affairs has been making an effort to reorganize and standardize the agricultural instruction given to Indian students.

Schools for delinquents.—Industrial education has been so closely associated with schools for delinquents in the past that even now when the term "industrial school" is used many people think of a reform school. All of these schools which have been located on farms have required farm work of the inmates. In line of progress in the education of delinquent youth, over half of the State reform schools have now provided for definite classroom instruction to accompany the farm work of the students. Such schools as the one located on Thompsons Island, in Massachusetts, have been pioneers in vocational agriculture and have pointed the way for public schools to follow.

Definite agricultural instruction is becoming a part of the educational work of a number of State prisons. In 1914 the author assisted in the introduction of agriculture into the California State prison at San Quentin. Before the year was over nearly 300 students were enrolled. Correspondence courses in agriculture prepared by the college of agriculture of the State university were made the basis for the instruction given. The men organized an agricultural club which met weekly for a general session, usually under the direction of a specialist from the university. The general session was made up of sections, each pursuing a special course. As some garden work was done at the prison and a herd of swine kept, some of the work was made practical. A number of agricultural books and large numbers of bulletins were added to the library, which was used extensively for reference purposes. Illustrative material, including colored charts, mounted pictures, and lantern slides, were prepared by the students, some of whom showed marked ability in this line of work. In some States the agricultural instruction is given as a regular phase of prison instruction, while in others it is conducted as a phase of extension work under the direction of the State college of agriculture.

Chapter II.

STATE AID FOR SECONDARY AGRICULTURE.

PROGRESS IN STATE AID.

Chronology of State aid for secondary instruction in agriculture, and home economics.

[Compiled by Miss M. T. Spethmann, U. S. Department of Agriculture.]

Laws passed.	State.	System adopted.	Initial amount to each school for maintenance.
1881.....	Alabama.....	Congressional district.....	\$4,000
1881.....	California.....	Indeterminate district.....	250,000
1881.....	Wisconsin.....	County.....	4,000
1885.....	Minnesota.....	Indeterminate district.....	4,000
1886.....	Georgia.....	Congressional district.....	10,000
1887.....	New York.....	Indeterminate district.....	10,000
1887.....	Michigan.....	County.....	12,000
1888.....	Oklahoma.....	Judicial district (supreme court).....	12,000
1888.....	Virginia.....	Congressional district.....	2,000
1890.....	Texas.....	High school.....	2,000
1890.....	Arkansas.....	District.....	40,000
1890.....	Maine.....	High school or academy.....	(*)
1890.....	Minnesota.....	High school.....	2,500
1890.....	Louisiana.....	do.....	1,250
1890.....	Nebraska.....	Indeterminate district.....	40,000
1890.....	Maryland.....	High school.....	800
1890.....	Vermont.....	Indeterminate district.....	10,000
1890.....	Mississippi.....	County.....	\$1,500-3,000
1890.....	New York.....	High school.....	\$300-2,000
1891.....	Massachusetts.....	Public high school.....	(*)
1891.....	.....	Independent agricultural schools.....	(*)
1891.....	Kansas.....	Normal training high school.....	\$250
1891.....	North Carolina.....	County.....	2,500
1891.....	North Dakota.....	do.....	3,000
1891.....	.....	High school.....	2,500
1891.....	Wisconsin.....	do.....	\$500-700
1891.....	Colorado.....	Indeterminate district.....	15,000
1891.....	Maine.....	High school.....	500
1891.....	Utah.....	Rural high school must teach agriculture to secure general State aid.....	
1892.....	Arizona.....	High school.....	2,500
1892.....	Louisiana.....	County.....	\$1,000-1,500
1893.....	Kansas.....	Normal training high schools.....	(*)
1893.....	Indiana.....	High school.....	(*)
1893.....	Iowa.....	Consolidated schools, teacher training.....	750
1893.....	Nebraska.....	High school.....	1,250
1893.....	New Jersey.....	County.....	10,000
1893.....	Pennsylvania.....	Indeterminate district.....	5,000
1893.....	Tennessee.....	County.....	1,500
1893.....	Vermont.....	High school.....	200
1893.....	.....	do.....	150,000
1895.....	Texas.....	do.....	150,000
1895.....	Virginia.....	Congressional district.....	125,000

(*) Total.

(*) Two-thirds cost of instruction; \$500 maximum.

(*) Two-thirds salaries.

(*) One-half net maintenance.

(*) \$250 (making total of \$500).

(*) Two-thirds cost of vocational instruction.

(*) Total additional aid.

The foregoing table does not show the progress that has been made in matters of administration and in getting results in general.* Due

to the lack of any organized system of agriculture for secondary schools, much money has been spent by the States without getting results in better-trained farmers. It will be noted that for the first 10 years of this period of independent State aid that all of the money went to the support of some form of special agricultural school; in fact until very recent years many have discussed the problem of secondary agriculture as if it had to do only with these agricultural schools. Because some of the districts in which they were established had no rural high schools of a general character, and because a system of vocational training in agriculture had not been developed, these schools have not been agricultural schools in a strict sense. Their history has been in a sense similar to that of the land-grant colleges; without restrictions as to their field and without a guide to follow, they have adapted themselves to immediate service along lines already laid down. In more recent years many of the States have turned more toward aiding existing high schools in establishing departments of agriculture. Money appropriated for this purpose has not always been spent strictly for the purpose for which it was appropriated. The chief reason for this is that States have appropriated the money without establishing a standard and without providing a State organization and a means of supervision and inspection so that a standard could be maintained.

More recently some of the States, having profited by the experience of these other States, have provided for a more definite system of vocational agriculture with State aid. They have not only provided money for establishing schools and for paying a part of the salaries of teachers in agricultural departments, but they have also provided adequately for State supervision. The work has been developed toward a definite end, definite standards have been set, and means have been taken to see that they were reached. The experience of most of the States has justified the belief that State aid and supervision is needed mostly in the teaching of vocational agriculture. In putting the work upon a vocational basis, it meant teachers with better training, hence more equipment and more expensive and better supervision of both teachers and students, all of which mean a greater outlay in money than ordinary instruction. Placing agriculture upon a vocational basis should mean more immediate returns in the increased capacity of the student in production. Local communities have not felt able to bear the added burden of expense, hence the State has come to their aid. Before a national program for aiding secondary schools in vocational agriculture was outlined there was a definite system of vocational agriculture established in the following States: Massachusetts, New York, Pennsylvania, New Jersey, and Indiana. As the national law giving Federal aid to vo-

cational agriculture and the policy of the Federal board in its administration have been determined to a great extent by the work in these States, we shall consider them more in detail.

MASSACHUSETTS.¹

In 1911 the Commonwealth of Massachusetts passed an act governing the establishment and maintenance of State-aided education in vocational agriculture as a part of its State plan for vocational education. The act provided a State fund to reimburse local boards of control for two-thirds of the salaries of instructors in high-school departments of agriculture and one-half the net sum expended in the maintenance of county schools of agriculture.

The provision of the act made it possible for departments of agriculture to be established in existing high schools under the control of the regular school authorities.

To avail itself of the act the city council or town meeting must pass an ordinance authorizing the school committee to establish such a department. While such a department is a part of the regular high school, it must meet a standard set by the State board of education and submit to direct supervision of the agents of that board. An advisory committee of 5 to 15 members is expected to aid in direction of the work in the local community. The instructor employed for such a department is expected to have a well-rounded training in practical agriculture, that he may aid in community work among farmers and supervise farm work of the students. He must devote all of his time to agricultural work. As a rule the instruction and supervision are rather intensive, 1 teacher not having over 20 students. Should as many as 30 students enter the department two instructors would be employed. With two teachers there is opportunity for division of work which permits of some specialization. Fifty per cent of the student's time in such a department is to be spent in vocational agriculture, the other half of the time being devoted to regular high-school subjects.

To establish a county school of agriculture there must be in each case a special act of the State legislature providing for a board of trustees, bond issues to cover the first cost of the school plant, and a tax levy for yearly maintenance. The first cost is estimated at from \$75,000 to \$100,000, and \$20,000 for the first year's maintenance. Such an act must be submitted to the county concerned for referendum vote in the November election. The controlling board of such schools consists of seven members—three county commissioners serving ex officio and four members appointed by the governor, all serv-

¹ See Massachusetts Board of Education. Bulletin 72. Information Relating to the Establishment of County Agricultural Schools and Agricultural Departments. All yearly reports of State-aided vocational agricultural education.

ing without pay. The board employs a director of the school, who serves as its executive officer and who is responsible to the State board for the management of the school.

These county schools having 100 or more pupils and employing a number of instructors afford a degree of specialization not possible in the high school department. The entire curriculum of these schools is more dominantly vocational. Eighty per cent of the time must be vocational agriculture, 50 per cent being productive farm work. Of the 20 per cent of the time devoted to general education one-half of that time, 10 per cent of the entire time, must be given to instruction in citizenship, personal hygiene, occupational diseases, and accidents. These schools, like the high school departments, do not provide dormitories, as they are supposed to take students living at home on farms. The county schools, however, are all located on farms which are used for instructional purposes.

The home-project plan.—In giving instruction in agriculture to students living upon farms, the home-project method has been worked out in Massachusetts. This method is essentially an effort to apply the part-time idea to the teaching of agriculture. An effort is made to organize and direct the home work of the student and to connect it with the instruction of the school in such a way that its educational value is increased. When such work is so organized and directed it is made a part of the instruction of the school and accredited as such. As the practical work of the students' project is made an approach to the study of the principles involved, the project plan is a working out of the problem method on a rather extensive scale. To have the highest educational value a project should have the following essentials: It must involve new experience and the working out of new problems, extending over a considerable period of time; it should have direct supervision by competent authority; the work should be carefully planned at the outset and accurate records and accounts kept of the finance and methods involved; this record is made on the basis of a written report of the work. Each student before entering the work in agriculture must have provisions for carrying on suitable projects to be directed by the instructor in agriculture. A written agreement between the student, his parents, and the teacher is required. The student is expected to have individual responsibility for his project and to participate in the profits and losses. There is a definite relation between each project and the instruction offered. A course in poultry husbandry is based upon a poultry project, while a course in vegetable gardening is based on a garden project. If a student can not secure a suitable project at home he may be allowed as a substitute for a project the privilege of working upon a suitable farm; providing such work may link up in a definite way with the instruction of the

school and may be given some direction by the instructor. A student in dairy husbandry may have no opportunity for dairy practice at home but secure a position to work mornings and evenings on a dairy farm: such work is considered to be as valuable from an educational point of view in some cases as the care of one or more cows on the student's own account at home.

The instructors are employed for 12 months and spend their summers supervising the student projects, aiding the boys' and girls' club work, and rendering general community service along agricultural lines.

From the standpoint of school administration the home-project plan has the advantage of securing farm practice under normal conditions with a minimum of equipment at the school. If adequate supervision is given the home work one instructor can direct relatively few students, especially if they are scattered over a wide area. In such cases transportation of the instructor or supervisor becomes a big item of expense. When the Massachusetts plan was being developed for the first year or two the overhead expense seemed all out of proportion to the results obtained, but as the work has developed, not only the number of schools and departments have increased, but the number of pupils per instructor as well, so that the overhead cost per pupil has been lowered. The State board has insisted, very wisely, upon records from which it is able to show that the money spent by the State has yielded immediate returns in dollars and cents. The following table will show the development of the work in the increase of students and the money earned:

Earnings of vocational agricultural students.

Year.	Number of students.	Earnings.
1912	70	\$11,100.17
1913	89	17,982.51
1914	235	42,000.73
1915	413	56,254.75
1916	497	84,173.43

NEW YORK.¹

When New York, in 1913, amended its laws relating to industrial schools passed in 1910, it had the benefit of some of the work done in Massachusetts. The plan worked out for agricultural education is modeled in a large measure upon the Massachusetts plan. New York has a number of special schools of agriculture of secondary grade which are to be in a greater extent independent in their organization and administrations. These schools are not included in the

¹ See University of the State of New York. Bulletin No. 626, 1916. Schools of Agriculture, Mechanic Arts and Home Making.

schools of agriculture, mechanic arts, and home making. These schools are of two types: Intermediate schools which base four years of vocational work upon six years of elementary training, and high schools which base their four-year courses upon eight years of elementary work. In both cases, although known as schools of agriculture, mechanic arts, and home making, they are, in reality, vocational departments of ordinary high schools under the direction of the principal of the general school. The law provides that the commissioner of education shall apportion from the State school money to each of these schools a sum equal to two-thirds of the salary of the first teacher and one-third of the salary of each additional teacher, provided:

(1) That the time of such teachers is devoted exclusively to such school. (2) That the school has at least 15 pupils. (3) That the school maintains an organization and course of study and is conducted in a manner approved by the commissioner of education through the division of agriculture and industrial education. In a city, the board of education may establish one of these schools, but in a common school district the question of establishing such a school must be determined by vote in the annual district meeting or a special meeting called for the purpose. If the school authorities are not capable of giving the teacher and students technical aid with agricultural problems, it is suggested that an advisory board shall be appointed.

At the time the system was studied in 1915 these boards did not appear to be especially active and as helpful as it was hoped for.

Although the New York plan is in many ways similar to that of Massachusetts, it is not quite so intensive and a great deal more is left to the local communities. In 1916, 64 schools had availed themselves of the provisions of the law. In some cases the classes were much larger than in Massachusetts. With more schools and a larger number of students there was less intensive supervision of both teachers and pupils. Regarding the courses of study, it will be seen from the following that while the State sets a standard it allows leeway for adaptation:

COURSES OF STUDY.

The classroom and laboratory instruction in these schools and departments is to be based upon practical experience gained on the farm, at home, or elsewhere. It is therefore impossible to prescribe courses of study or to prepare adequate outlines for particular subjects. This does not mean that the course of study is to be changed to suit the whims of pupils who do not know exactly what they want or need. A definite course of study should be formulated at the beginning and followed until there is urgent need for a change. A well-balanced general knowledge of the whole field of agricultural science and practice should be represented in the course.

The following courses are not prescribed, but it is expected that any school desiring to make any change will secure the approval of the commissioner of

education before doing so. Other subjects may, after approval, be substituted for those indicated below. It is expected that the arrangement of subjects and the content of those subjects will be suited to the community in which the school is located.

A suggested course in agriculture for intermediate schools of agriculture.

FIRST YEAR.		THIRD YEAR.	
	Hours, a week.		Hours, a week.
English.....	5	English.....	3
Arithmetic.....	5	Mathematics, including bookkeep- ing.....	5
American history.....	2	Biology.....	5
Mechanical drawing and shop- work.....	3	Soils and fertilizers.....	5
Commercial and industrial geog- raphy.....	5		18
General agriculture.....	3		
	23		
SECOND YEAR.		FOURTH YEAR.	
	Hours, a week.		Hours, a week.
English.....	5	English.....	3
Mathematics.....	5	Agricultural physics and agricul- tural chemistry.....	5
American history.....	3	Animal husbandry and dairying.....	5
Mechanical drawing and shop- work.....	5	Special agriculture to suit local conditions:	
Plant husbandry (growing clubs in the line of home project with plants).....	5	Fruit growing.....	5
	23	Grape culture.....	
		Market gardening.....	
		Poultry, etc.....	
			18

A suggested course in agriculture for high schools of agriculture.

FIRST YEAR.		THIRD YEAR.	
	Hours, a week.		Hours, a week.
English.....	4	English.....	3
Algebra.....	5	History.....	3
Biology.....	5	Economics.....	2
Farm mechanics.....	5	or.....	5
and.....	7½	History.....	5
Poultry husbandry.....		Animal husbandry, including dairying.....	5
	21½	Fruit growing.....	5
			18
SECOND YEAR.		FOURTH YEAR.	
	Hours, a week.		Hours, a week.
English.....	3	English.....	3
Plane geometry.....	5	American history with civics.....	5
Soils and fertilizers.....	5	Chemistry or physics.....	5
and.....	10	Farm management.....	5
Farm crops.....			
	18		18

Methods of teaching.—The home-project plan, as operated in New York, is somewhat of a modification of the plan as developed in Massachusetts. In Massachusetts the study of agriculture grows out of the project. In one class students may have a number of different projects, hence the project study is to a great extent individual study. In New York the project grows to a greater extent out of the course. A project may be started in the spring and an increasing amount of time given this practical work until by the time the summer vacation begins instructor and students are putting in a large share of their time upon the home-project work. The commissioner of education is empowered to give each school district an additional fund of \$200 to extend the employment of the agricultural instructor through the summer months. Most of the teachers are so employed. Their chief duty in summer is to supervise the home work of the students, but in addition to this they render a great deal of community service to the farmers and collect material for teaching purposes during the winter months.

PENNSYLVANIA.

In 1911 the school code of Pennsylvania made the teaching of agriculture obligatory in all township high schools. Although much of the instruction under this requirement was perfunctory, it developed a feeling that agricultural instruction could be made well worth while if established on a different basis. The vocational education act, passed in 1913, provided State aid for departments of agriculture in high schools and for special vocational schools with agriculture and home-making dominating in the curriculum. These departments and schools are under the direct supervision of the bureau of vocational education, which is a part of the State department of public instruction. In 1916-17 there were 17 vocational schools and 18 vocational departments in high schools. There is little difference in the courses of study and method of instruction in the two types of schools. Local districts are encouraged to establish a department in connection with an existing high school. If such a school does not exist in a community which wishes the vocational work, or the existing school can not meet the requirements, a vocational school may be established. Such a school is in reality a general high school adapted to the needs of rural life. Districts which can establish neither schools nor departments may send their pupils to other districts for vocational training at State expense for one-half the tuition. The State reimburses local districts with vocational schools and departments for two-thirds the salary of the vocational teachers.

In giving aid to local communities the State makes it clear that the money must be used specifically for vocational education. It recognizes the fact that agriculture has value in general education, but defines vocational agriculture as follows:¹

Vocational agriculture has a specific purpose, that of preparation for useful and efficient service in occupation connected with the tillage of the soil, the care of domestic animals, forestry, and other wage-earning or productive work on the farm. Moreover, this training is given to the individual who has already indicated an occupational aim in life, which aim this particular form of training is designed to meet.

The State requires that all teachers of agriculture shall be employed for 12 months and that their entire time shall be spent in teaching and supervising agriculture. The following suggestions are given with regard to the selection of teachers:

*Qualifications of teachers.*²—Great care must be exercised in the selection of teachers who are qualified to take charge of vocational agriculture in the public schools. In all cases the success or failure of this type of training will depend very largely upon the selection of a teacher. Only such teachers as understand the purpose and aim of vocational training and are familiar with vocational methods will be successful in this work.

Such teacher should have an equivalent of a high-school education. He should be a graduate of an approved agricultural college, or, in lieu thereof, should have at least two years' training in a higher institution of learning, supplemented with at least four short terms or an equivalent in approved agricultural courses of study.

He must have had sufficient practical farm experience to make him familiar with farming methods. This should have been such as to put him in sympathy with rural life and to make him appreciate its problems.

A teacher having a general well-rounded knowledge of agriculture is better prepared to meet the problems arising in such a school or department as is here contemplated than one who is a specialist in a limited field.

It is highly desirable that the teacher of agriculture should have had some experience in teaching in the public schools previous to his entering upon this work.

Ability to make and use working drawings is a valuable qualification, as is also a knowledge of the use of tools and the use of the forge.

Course of study.—In addition to the regular course of study, outlined for students over 14 years of age who may spend the entire 12 months in school work and related home project, both vocational departments and school provide part-time and evening classes for those who are spending all or a large part of their working day in farm labor. An effort is made to link the study of agriculture in both part-time and evening classes as closely as possible with the work in which the student is engaged. In the regular day-school courses the students are expected to spend half their time upon agri-

¹ Commonwealth of Pennsylvania. Department of Public Instruction. Vocational Division. Bulletin 1, 1913. Vocational Education in Pennsylvania. P. 9.
² Ibid., Bulletin 2, 1913. Agricultural Schools and Departments. P. 9.

cultural and related practical work. All courses must be approved by the department of public instruction. Although it is expected that courses will be adapted to meet local needs, the schools which have been studied follow quite closely the following course suggested by the State department:

Outline of suggested course of study.

FIRST YEAR.		THIRD YEAR.	
	Hours		Hours
English	4-5	English	4-5
History and civics or other academic subject	4-5	Physics or other academic subject	4-5
Drawing	1	Drawing	2
Shop work	2	Farm animals, including dairying	5
Soils	5	Fruit raising	5
Poultry raising	3	Agricultural projects.	
Farm forestry	2		
Agricultural projects.			
SECOND YEAR.		FOURTH YEAR.	
English	4-5	English	4-5
One academic subject	4-5	Chemistry or physics	4-5
Drawing	1	Farm mechanics	4
Farm crops	5	Rural law	2
Vegetable gardening	3	Fertilizers	2
Ornamental gardening	2	Farm management	3
Farm bookkeeping	1	Agricultural project.	
Agricultural project.			

The nature of the work in agriculture given will be indicated by the description of the courses in the catalogue of the Lake Township Vocational School.

AGRICULTURE.

Poultry.—The study of poultry as a farm enterprise, including a study of poultry-house construction, the more important breeds of poultry, incubation, brooding, methods of rearing chickens, and the general care and management of the farm flock.

Vegetable gardening.—The work in this course includes practice in the management of hotbeds and cold frames, seed sowing, transplanting, and raising of early vegetable plants. The more important vegetables are started in detail and the planning of home gardens considered.

Soils.—During the last half of the freshman year a study is made of the origin, formation, classification, and physical properties of various soils, together with the relation of these to soil moisture, heat, and methods of soil management.

General science.—This course introduces the pupils to the fundamental facts of the common sciences so as to give the pupils this general knowledge before science work can be studied in detail in the junior and senior years.

Fruit raising.—Under this head the planting, training, care, fertilization, spraying, harvesting, and marketing of both tree fruits and small fruits are thoroughly studied. Laboratory work includes practice in grafting, mixing of spray materials, and field trips during which pruning is taught by having the pupils prune trees under supervision.

Dairying.—A general survey of the dairy industry, including a study of the separation and handling of milk, cream ripening and churning, and use of the Babcock test.

Animal husbandry.—A study of the history and characteristics of the different breeds of horses, cattle, sheep, and swine. Practice in judging animals and a study of feeding practices.

Farm crops.—A course including the study of the history, production, improvement, cultivation, harvesting, and marketing of cereals, hay, forage, fiber, and root crops.

Forestry.—The relation of forestry to agriculture, identification of tree characteristics, and uses of the various kinds of wood.

Ornamental gardening.—A study of the ornamentation of home grounds, including methods of planting and the selection of planting materials.

Mechanical drawing.—The study of methods of laying out to scale, inking, and tracing; reading of working drawings, etc.

Shop work.—The use of woodworking tools is taught by having the pupils make useful articles for the home and farm.

Farm bookkeeping.—The study and practice of double-entry bookkeeping as applied to business transactions of the farmer.

Farm mechanics.—Rope splicing, knot tying, lacing belts, study of gas engines, and farm machinery.

Fertilizers.—A study of the different kinds of fertilizers, proper mixtures for various crops, time and rate of application.

Farm management.—Planning the work of the farm, study of crop rotations; layout of fields, and other problems, including the making of financial statements of farm operations.

Rural law.—An elementary consideration of the law in its relation to the farmer.

Project work.—Each pupil is required to work out some project such as raising of some crop, poultry, or live stock each summer on his home farm under the supervision of his instructor.

Methods of teaching.—The home-project plan is in vogue in all of the schools and departments of vocational agriculture in Pennsylvania. The teachers of agriculture are known as supervisors and employed for 12 months in the year with the understanding that one of the most important phases of their work will be the summer supervision of projects. The project is preceded by a study of the subject in the classroom. The schools are encouraged to have classroom shops and a greenhouse equipped to give practical instruction to the students while at school. They are not encouraged, however, to supply farms or any land at the school for instruction in agriculture, as it is considered that the project work upon the home farm offers training under conditions more nearly normal and that an ordinary rural community is rich in resources of educational value in training for farming and rural life. As in Massachusetts and New York, an advisory board may be appointed. It is significant to note that it is advised that farmers be appointed who will cooperate with the teacher by allowing their farms, herds, and flocks to be used for teaching purposes.

NEW JERSEY.¹

It was in 1913 also that the State of New Jersey established a system of State-aided vocational schools and departments. In brief the plan established is for the State to give money for the equipment and maintenance of approved vocational schools on a dollar for dollar basis in proportion to the amount spent by the local community out of funds raised by local taxation to the amount of \$10,000 annually.

The following is summarized from the rules of the State board of education which govern the establishment of vocational schools and departments:

1. Advisory boards must be appointed by the local boards of control, subject to the approval of the commissioners of education. The advisory boards should be made up of persons who have had actual successful experience in the occupations for which the school prepares. The efficiency of vocational schools should be measured largely by the ability of their pupils to meet the demands of the trades, industries, and occupations for which these schools give preparation. Whether the schools give instruction in agriculture, home economics, or industrial subjects, the vocational work must be such as to prepare the pupil for wage earning by participation in actual projects and processes of a very real character. This requires an intimate and practical knowledge of actual conditions and practices in the work as it is carried on outside the school. Only those experienced as employers or employees can furnish this information. The task of establishing and maintaining these schools, on a practical basis, is so important and so difficult that the instructors in the school, who must themselves have had such experience, need also the advice and assistance of those having the practical knowledge of the industry or occupation and the conditions peculiar to it in the locality. The advisory boards have no power except to give advice and assistance to the local school authorities in carrying on the work.

The advisory board of an agricultural school or department must be made up of at least three successful farmers in the area served by the school and should represent the various agricultural activities taught.

2. A separate vocational school must be in a separate building and have a separate organization of curricula, equipment, pupils, and teachers.

3. A vocational department of another school must have a separate organization of curricula, pupils, and teachers as far as the vocational work is concerned.

4. The State board of education will not approve State aid for more than \$10,000 for any district unless the applications from all districts amount to less than \$80,000.

5. To receive State aid in any given year, application must be made before January 1.

6. In an all-day vocational school (a) not less than one-half of the time must be given to shop or farm work; (b) the shop must be conducted on a productive or community basis; (c) instruction must tend to become individual; (d) the shop must be carried on like the real shop outside; (e) the product must be useful; (f) the school day must not be less than six or more than seven hours in length; and (g) the agricultural vocational school must have its courses arranged as a series of projects.

¹ See New Jersey Department of Public Instruction. Bulletin No. 1, 1913. State-aided Vocational Schools.

7. The part-time class must give instruction of direct value to the pupil for the work in which he is engaged.

8. To secure approval, the part-time or continuation work must (a) deal with a specific group of workers; (b) add to the technical knowledge and mechanical skill of the workers; (c) provide efficient instruction; and (d) provide adequate amount of time.

9. An evening industrial or agricultural or household arts school must give short unit courses.

10. All vocational schools must provide for (a) shop or farm or household experience; (b) instruction in related subjects; and (c) instruction in academic subjects.

11. Schools must be convenient of location and access.

12. Schools must have adequate general and mechanical equipment.

13. Tuition may be paid by a district sending pupils to vocational schools and be reimbursed to the amount of \$25 per annum for each pupil.

14. Districts may transport pupils either within the district or to other districts and be reimbursed for 75 per cent of the amount expended.

Vocational agriculture in Atlantic County.—The provisions of the State vocational education act for agricultural education have been taken advantage of to the greatest extent in Atlantic County. In this county a rather complete county system has been worked, but under a board of five members. Agricultural schools have been established in four centers: Pleasantville, Cologne, Hammonton, and Minotola, each in charge of a teacher employed for the full year, and all under the supervision of a county director. In these schools the students are classified as follows:

1. *Full time.*—Men and boys above 15 years of age taking at least 3 hours per day, 5 days a week, during the winter.

2. *Part time.*—Students taking less than the time prescribed for full-time students, spending their time mostly on project study. Part-time classes are held mostly at night.

3. *School pupils.*—Students over 15 years of age enrolled in the public schools, above the seventh grade, taking not less than 3 hours per week. Work consists chiefly of elementary project study, which is taken in lieu of a like number of hours of regular school work.

4. *Lecture course.*—For men and women meeting once a week or oftener in the winter to discuss agricultural problems of community interest.

5. *Night classes.*—Composed of men who meet once a week or oftener studying project problems and subjects of interest upon their home farms.

6. *Short course.*—For those unable to attend a full-time course a detailed study of a specific subject is made for a period of 2, 4, or 6 weeks.

As the work was in operation in 1915 when the school at Hammonton was visited, the aims and methods appeared to be more narrowly vocational than the agricultural work conducted in other States.

More mature students were reached and less effort made to link the work closely with other school work. The community is a center of intensive agriculture, including production of small fruits and peaches. Such a community would furnish a wealth of resources for a general education in agriculture, as the student could gain experience in many lines. Instead of encouraging the direction of training and the use of material from this point of view, the students were encouraged to become proficient in a special line. Students were encouraged to stay with a project for several years if necessary to secure the maximum financial returns, although it might be to the neglect of opportunity for new experience in other lines.

The entire county system of agricultural schools was at the service of the farmers of the section to aid them in their problems. In this work it took the place of a county farm bureau. The director in fact did act through a cooperative arrangement as county agent. For the use of the farmers in making analysis of soils, fertilizers, and spraying material, a chemical laboratory is maintained at Pleasantville. The agricultural instructors also aided in the organizations of farmers for cooperative buying and selling. In 1916 the staff took over the entire direction of the boys' and girls' agricultural clubs.

INDIANA.

In Indiana the vocational agriculture of the secondary schools is linked closely with elementary agriculture in the common schools and with the boys' and girls' club work directed by the agricultural extension department of Purdue University. The same act providing for vocational education provides for employing county agents. At the same time the vocational education law was passed in 1913 the legislature made the teaching of elementary agriculture mandatory in the public schools of towns and townships. According to the law the county agent is expected to "aid the county superintendent of schools and the teachers in giving practical education in agriculture and domestic science." The vocational education law provided for establishing either schools or departments which may receive State aid. In 1916 thirteen communities had established departments of vocational agriculture. The departments served the needs of the rural communities so well that there was no demand for special agricultural schools. In addition to the vocational teachers who are employed for 12 months, a number of other teachers are given special training and employed during the summer months to supervise the home project work. Twenty-one such teachers were employed during the summer of 1915, supervising the work of 700 pupils. The greater part of this work is considered a definite part

of the boys' and girls' club work organized as a phase of agricultural extension.

Vocational agriculture may be given in one of the three following classes: (1) All-day vocational schools; (2) part-time classes; (3) evening vocational classes. The all-day school may be organized either as a separate school or as a distinct department of another school. When organized as a department the organization must be distinct from the regular school. The following from a bulletin¹ giving plans for organization shows the point of view with respect to such organization:

Whether vocational education is conducted in a separate building or under the same roof as general education is not necessarily of vital importance. It is, however, absolutely necessary, if State aid be given, that the vocational work be so carried on that it may realize its dominant aim of fitting for useful employment in the shop, in the home, or on the farm. If vocational agriculture is organized under the first plan, the local community will have established a presumption in favor of efficient work in the eye of the department.

The following from the same publication² gives an idea of the nature of the work in the all-day schools or departments:

All-day agricultural schools.—In the all-day agricultural school pupils must give most of their time to practical business. The work in agriculture and its related sciences. Practical problems must be worked out on a real farm under the direction of the teacher. Since most of these activities must take place during the summer months, it will be necessary for the vocational teachers in an agricultural school to be employed for the entire year, with a vacation in the winter. Their entire time during the summer should be taken up with superintending the practical work of the students, while in the winter months their time would be devoted to the home-project work and to teaching the theory and science underlying the art of farming.

Part-time classes give vocational instruction to students over 14 and under 25 years of age, who are regularly and lawfully employed in the field of work for which instruction is provided and where the instruction is complementary to the work in which the pupils are engaged during the time they are not attending school. The Indiana law provides that—

when the board of education or township trustee of any city, town, or township has established approved vocational schools for the instruction of youths over 14 years of age who are engaged in regular employment, in part-time classes, and has formally accepted the provisions of this section, such a board or trustee is authorized to require all youths between the ages of 14 and 16 years who are regularly employed to attend school not less than 5 hours per week between the hours of 8 a. m. and 5 p. m. during the school term.

Evening classes in vocational agriculture are established for students over 17 years of age who are employed in agriculture during

¹ Department of Public Instruction, Bulletin No. 6, 1914. Vocational Education in Indiana. P. 18.

² *Ibid.*, p. 20.

the day. The instruction in an evening class in agriculture must deal with the subject matter of the day's employment, and must be so given as to increase the efficiency of the student in his work.

Local communities desiring to establish any or all of these forms of vocational agriculture in partnership with the State, which pays two-thirds the cost of such instruction, are subject to the following provisions: (1) Local school authorities must provide the necessary money for the purchase or rental of lands and buildings adapted to the needs of the vocational department or school to be established and pay the cost of all necessary equipment. (2) They must assume entire responsibility for the conduct of the work and must initiate its organization. (3) They must accept standards set by the State, submit to State supervision, and receive approval of the work done.

*Standards for agricultural schools and departments.*¹—1. Evidence of proper interest on the part of the community must be furnished the State board of education. There must be an assurance of not less than 15 and not more than 25 students for each day, part-time, or evening class organized. The location of the school must meet the hearty approval of the people of the community as well as the State board.

2. An advisory committee, consisting of five members, shall be appointed to "counsel with and advise the board and other school officials responsible for the management and supervision of" the vocational agricultural school or department. It is recommended that one or two members of the committee be women who are familiar with farm home problems.

3. The teacher of agriculture must be a graduate of a standard high school and a standard agricultural college or prove an equivalent training in technical agriculture. He must devote all of his time during the 12 months to the vocational work.

4. Laboratory equipment must be approved by the State board. There should be apparatus sufficient for thorough work of secondary grade in soils, crops, animal husbandry, dairying, poultry, horticulture, carpentry, and blacksmithing, or for such of these lines of work as are to be taken up. A complete list of books must also be submitted for the approval of the board.

5. The course of study must be worked out in detail and submitted at least 30 days before the beginning of the school term for the approval of the board. The course may be for one, two, three, or four years. Where the school authorities decide upon a four-year course the following is recommended:

¹ See Department of Public Instruction. Bulletin No. 7, 1914. Regulations Governing Vocational Agricultural Schools and Departments in Indiana.

Course of study.

FIRST YEAR.

	Rec.	Lab.
English	4	
Horticulture	3	2
Soils and fertilizers	3	2
Mechanical drawing and woodworking		2
Mathematics	3	
Home-project work		

SECOND YEAR.

English	3	
Civics	3	
Mathematics	2	
Dairying	3	2
Farm crops (not limited to botany)	3	2
Mechanical drawing and woodworking		2
Home-project work		

THIRD YEAR.

English	3	
United States history	3	
Farm accounting	3	
Physics (not academic)	3	2
Animal husbandry	3	2
Carpentry		2
Home-project work		

FOURTH YEAR.

Farm management (including marketing)	5	
Poultry	2	2
General history (elective)		
Farm mechanics and engineering	2	1
Chemistry (not academic)	3	2
Forging and blacksmithing	1	2
Home-project work		

6. Home-project work must be an integral part of the course of study for each student. This work must be carefully inspected and supervised by the instructor. Each pupil must make a written report of each project based upon a careful record. The instructor must not only submit these reports to the State board upon completion of the project but must also submit within three weeks of the beginning of the school term an outline of the work to be done by each student. The following projects are suggested. Feeding swine, sheep, cattle, or poultry for market; feeding poultry for egg production; caring for a dairy cow and her products; caring for a team of horses, or a brood sow; selecting, testing, and grading seeds for farm crops; poultry hatching, etc.; corn growing, gardening, canning fruits and vegetables; marketing farm products; and small fruit growing.

Chapter III.

AGRICULTURE AS TAUGHT IN SOME SECONDARY SCHOOLS.

Representative schools chosen.—The author has had abundant opportunity to visit secondary schools for the purpose of studying their organization and methods of teaching agriculture. From a large number studied the following have been chosen not because they were the best schools visited but because they were fairly representative of the type indicated:—

District schools of agriculture: Fifth District Agricultural and Mechanical School, Monroe, Ga.

County schools of agriculture: Agricultural High School, Sparks, Md.; Bristol County Agricultural School, Segreganset, Mass.

Public high schools: Hannibal High School, Hannibal, N. Y.; Concord High School, Concord, Mass.; Hopkins Academy, Hadley, Mass.

Normal schools: State Normal School, Platteville, Wis.

Private schools for whites: Berry School, Mount Berry, Ga.

Private schools for Negroes: Manassas Industrial School for Colored Youth, Manassas, Va.

FIFTH DISTRICT AGRICULTURAL AND MECHANICAL SCHOOL, MONROE, GA.

*The district agricultural schools of Georgia.*¹—In 1906 the General Assembly of Georgia passed an act providing for the establishment and maintenance of an industrial and agricultural school in each of the 11 congressional districts of the State. The schools were to be definitely affiliated with the University of Georgia as branches of the State College of Agriculture. The university became interested in their supervision. A keen interest was aroused in each district, and sharp competition developed among different localities for the location of the schools. Liberal bids of land and cash were made, the total of the accepted bids amounting to approximately \$139,000, in cash and 3,214 acres of land. Electric lights, water, and sewage disposal were furnished free to each school for five years.

These schools were to be of secondary grade, intermediate between the rural elementary schools and the agricultural college. The law

¹ For a detailed description of these schools, see U. S. Bureau of Education, Bulletin, 1910, No. 44. The District Agricultural School of Georgia.

stipulates that the principal shall be an intelligent farmer and that he shall be aided by a faculty capable of giving practical instruction in agriculture and mechanic arts along with the elements of an English education. The district agricultural schools of Georgia represent the most extensive State-aided system of special agricultural schools in this country.

Buildings and equipment.—The citizens of Monroe bid \$31,000 in cash and 250 acres of land. This bid was accepted and the fifth district school located at Walker Station in Walton County, about 3 miles north of Monroe on the Gainesville Midland Railroad. Although local trains stop at Walker, the school is located in open country, forming a small community by itself. The buildings consist of an academic building and a boys' dormitory, both modern brick buildings valued at \$15,000 each. A frame cottage built for the principal's residence is used at the present time as a girl's dormitory. In addition to the farm buildings, there is a school shop, a smokehouse, a powerhouse, and a laundry, which, with its equipment, is valued at \$2,000.

As the school farm is considered the agricultural laboratory, there is no special provision made for inside laboratory instruction. The chemical laboratory is used for those exercises given. The school shop is provided with benches and tools for woodworking and a forge and anvil for ironworking. A separator and other equipment for handling milk is a part of the kitchen equipment. Likewise a canning outfit is used in putting up fruits and vegetables for use in the school dining room. A relatively large room of the academic building is used both for the principal's office and as a library. The library, having very few bulletins and reference books on agriculture, is used but little for agricultural study.

The school farm.—The 250 acres which comprise the school farm are for the most part excellent agricultural land valued at \$100 per acre. About 30 acres are used for the school buildings and campus. Permanent pasture comprises 50 acres and 45 acres in woodland, leaving 125 acres in cultivation. Fifteen acres of the cultivated land are used for cotton as a cash crop, and all the remainder used to supply food to the student boarding house, either directly or indirectly through feeding farm animals.

The farm buildings include separate barns for horses, cows, and calves; a machine shed, poultry and hog houses. A new concrete silo has been built preliminary to building a modern dairy barn. The farm animals include 2 Percheron brood mares with 2 colts, 3 mules, 1 Hereford and 1 Jersey bull, 13 dairy cows, 18 head young cattle, and 75 hogs. The value of the live stock owned would approximate \$3,500. Farm machinery to the value of \$1,500 is owned.

In addition to the tools and implements commonly found on southern farms, there is a small grain separator, a gasoline engine, an ensilage cutter, a hay press, manure spreader, corn shredder, and an electric motor. The gross income of the farm for 1915 was \$6,600, leaving a net profit of \$1,173.29.

Students.—On September 28, 1916, there were 120 students, 79 of whom were boys and 41 girls. All the students live at the school except 2, who live on near-by farms, and 12 who live in Monroe. The following students are taking courses in agriculture: First year, 36 (8 of these are girls); second year, 29; third year, 13. Although the school was then filled to its capacity for students, registration was not restricted to residents of the fifth district. Students are registered from other parts of Georgia and from three other States.

Course of study.—The course of study¹ adopted for the district agricultural schools of the State in 1915 is in operation as far as equipment and time will allow. The work in poultry husbandry, dairying, and farm management is not given at the present time, nor the agricultural laboratory work suggested for the first year. Students are expected to have completed the elementary school of seven grades before entrance. Boys must be 14 and girls 13 years of age.

Standard of credit.—Although the State standard for graduation is but 14 units, most of the students are taking more nearly 17 units of work. Five class periods of 40 minutes are equivalent to 1 unit. In laboratory work the periods are 80 minutes long. No credit is given for farm practice. The school year consists of 36 weeks.

Methods of teaching.—The classes in agriculture visited were under two different instructors. One of the instructors, an experienced teacher, had excellent interest, as he sought opportunity to connect the lesson of the textbook with the daily farm experience of the students. The other teacher, without previous teaching experience, was called upon to take hold of a class for which he had no preparation. The students dragged through a recitation period by taking turns in reading from the textbook. Although an effort is made to utilize the farm experience of the students in the classroom recitation, there is no definite connection between the course of study and the planning of the school farm and no definite relation between the daily classroom recitation in agriculture and the daily farm labor.

Use of the school farm.—Although there is a lack of definite relation between farm work and class work, the dominating aim of the school farm is to furnish practical instruction to the students. Each student is required to spend 86 hours per week in farm practice. The

¹ For a description of the course of study with class schedule, see Bureau of Education, Bulletin, 1916, No. 44, pp. 19-28.

work consists of the regular labor of the farm in season under the supervision of one of the instructors or the farm superintendent. In order to distribute the work and provide for supervision, the first and third year students have class work in the forenoon and field work in the afternoon, alternating with the second and fourth year students. All of the farm buildings have been constructed by the students. Most of the students do more than 36 hours of farm work a week. A daily record is kept of all work done and the amount beyond the required hours is credited upon their board account at 5 to 10 cents per hour, according to the nature of the work and the age of the student. Surplus work is given to those who are in most need of the money. Several students have been able to pay their way by working on the school farm. A number of students are retained for the summer work, receiving as wages \$18 per month and their board. A few students have paid board and received pay by the hour for their services. The students who remain in the summer secure some practice not to be obtained by most of them who return home. For example, the school cans a good part of its supply of certain vegetables and fruits during the summer.

Although the aim of the school farm is primarily educational, it is depended upon largely to supply the dormitory and as a source of revenue, hence it can not plan its work in such a way and grow such crops as to secure the maximum educational value. The students may know the practice involved in cotton production, hence there may be little necessity from an educational point of view for growing cotton, but the school has soil well adapted to cotton and needs it as a cash crop.

A definite rotation is maintained. The farm has shown continual improvement since the school was established, hence serves well as a general demonstration of good farming methods. The following shows the acreage of crops for 1916: 15 acres cotton followed by rye; 15 acres wheat followed by peas; 40 acres corn (partly for silage) followed by winter oats; 35 acres oats followed by peas for hay; 5½ acres alfalfa; 50 acres pasture; and 8 acres orchard.

It is interesting to note that when the question came up as to using the farm more specifically for educational purposes, the principal thought it could be done better with a farm of only 15 acres.

Social administration.—As most of the students live at the school, the problem of directing their social life is presented. The girls and boys are kept separate for the most part, the girls living in a separate building under the direction of a matron, and the boys living in the main dormitory under the direction of the principal and the male instructors. All of the students take care of their own rooms. They also do most of the other janitorial services and the work of the school.

boarding house. For the latter services the girls are given school credit and pay for overtime as the boys are in the case of farm work. Board and laundry are furnished to the students at the rate of \$10 per month. As no tuition is charged and but one or two small fees exacted, the cost is comparatively low.

As the school is located in the country, the students have little opportunity to spend money. Their entire time is under the direction of the principal. From 7.20 to 4.20 they are supposed to be engaged in the classrooms or engaged in work or study, except for a brief period for dinner. Although the girls are required to dress in a neat uniform, the boys most of the time appear in the classroom and at the table in the same clothes they wear at farm labor. The following is a schedule of the usual work day:

6 a. m.—Arise.
6.25 a. m.—Room and person in order for inspection.
6.30 a. m.—Breakfast.
7.50 a. m.—Chapel.
8.10 a. m. to 12.15 p. m.—School or farm work.
12.15 p. m.—Dinner.
1 to 4.20 p. m.—School or farm work.
4.20 to 6.15 p. m.—Recreation if desired.
7 p. m.—Inspection.
9.30 p. m.—Light bell.
9.45 p. m.—Retire.

Saturday afternoons are frequently taken for athletic sports. At the time of the visit there was a very lively football game in which a team selected from the first and fourth years contested with a team representing the second and third years. Although this was strictly a school affair, there was no lack of interest. In the evening the students assembled for a short program, followed by a social hour in which the boys and girls joined together in simple dances and harmless games. The principal directs these affairs upon the assumption that it is natural for boys and girls of high-school age to come together in a social way, and that there is little danger if there is proper supervision.

On Sundays, Bible classes and simple services of a nonsectarian character are held for all. The problem of finding profitable, harmless pastime for Sunday has not been completely solved, however.

Local extension work.—By an arrangement with the State agricultural college, one of the instructors in agriculture is to spend one-half of his time as a farm demonstrator for Walton County. The man appointed to the position had not gotten his extension work fully under way at the time of the visit. Since the school was first established there has been considerable extension work among the farmers. The principal of the school is a practical farmer who was reared in

the country; hence he is well qualified to act as a farm advisor. The school has cooperated with the farmers in the purchase of live stock and has used its pure-bred live stock for community breeding. The school farm has been a source of improved seed as well as pure-bred stock for breeding purposes. The school has taken active part in the county fairs held at Monroe. During the summer farmers' institutes are held at the school, where both men and women meet with experts from the State agricultural college. At the one held during the last summer there was an attendance of 75. A short summer school was held also for teachers. During the last session there were 130 in attendance. Two teachers of agriculture gave practical courses to rural teachers, preparation for work in canning being a prominent feature. During the coming year this course is to be extended and all supervisors in the district are to take part as instructors. It is not expected that the school will be able to accommodate all who apply.

Each summer the principal undertakes to visit the homes of all students living in the district that he may become acquainted with the parents and the conditions surrounding the home life of the students.

BALTIMORE COUNTY AGRICULTURAL HIGH SCHOOL, SPARKS, MD.

Baltimore County, Md., has for years maintained an efficient school system, the county serving as a unit for administration. Inasmuch as the county has extensive agricultural interests, in 1908 a special agricultural school was established to serve the whole county. This school is located in the open country, not near any city or village, but adjacent to a small railroad station. The school was opened for the year 1908-9 with an enrollment in the high school department of 50 students. A granite building with five classrooms is used for grade students as well as secondary students. At the time the author first visited the school, in April, 1915, there were 99 elementary students and 77 in the high school. Two teachers took care of the grade students in two of the rooms, while five teachers were employed in secondary work.

Although this school was established as an agricultural school, its aim is apparently not to train farmers in any narrow vocational sense, but to give a broad training for rural life without attempting to meet college entrance requirements. The course of study which follows might be adapted to the needs of any rural community.

Course of study.

FIRST YEAR.		SECOND YEAR.	
	Units.		Units.
Agriculture	1.0	Agriculture	1.0
Arithmetic	1.0	Algebra	1.0
English	1.0	English	1.0
Botany	1.0	Zoology	1.0
Manual training or domestic science .....	.4	Manual training or domestic science .....	.4
History .....	.6	History .....	.6
THIRD YEAR.		FOURTH YEAR.	
	Units.		Units.
Agriculture or domestic science	1.0	Agriculture or domestic science	1.0
Plane geometry	1.0	Solid geometry and advanced algebra	1.0
English	1.0	English	1.0
Chemistry	1.0	Physics	1.0
Physiology .....	.4	German ¹	1.0
Manual training or domestic science .....	.6	Manual training or domestic science .....	.6

COURSES IN AGRICULTURE.

First year.—Soils. Text: "Soils," by Fletcher. Warren's "Elements of Agriculture," used as a reference. A special laboratory manual is used.

Second year.—Farm crops. (Vegetables to be a part of the course next year.) Texts: "Cereals in America," and "Forage and Fiber Crops," by Hunt.

Third year.—Animal husbandry and dairying. Texts: "Types and Breeds of Farm Animals," by Plumb; "Milk and Its Products," by Wing; "Dairy Laboratory Guide," by Ross.

Fourth year.—Farm management and horticulture. Texts: "Farm Management," by Warren; "Principles of Fruit Growing," by Bailey.

COURSES IN SCIENCE.

Botany.—Text: "Botany for Schools," by Bailey. Herbarium of 50 specimens required.

Zoology.—Text: Last half of course spent in economic entomology. Twenty-five specimens of economic species required as a collection.

Chemistry.—Text: Clark and Dennis.

Physiology.—Text: "The Human Mechanism," by Hough and Sedgewick.

Agricultural instruction.—The principal of the school also serves as instructor in agriculture and is assisted by another man. Both instructors are graduates of the New York State College of Agriculture, the assistant having just taken up the work in place of a man who had accepted a position in the United States Department of Agriculture. The principal proved to be an especially capable instructor and rural life leader, giving good evidence of earning the

¹ German is elective, all other subjects are required. Recitation periods are for the most part 50 minutes long. In all courses in agriculture and all science except physiology there is one double laboratory period per week. Occasionally field trips require a longer period, or a whole day.

relatively large salary he received. The assistant, on less than half the salary, did not give evidence of having special aptitude for teaching. He had not been away from college long enough to get away from college material and methods.

Correlations.—Inasmuch as the science is taught by the men teaching agriculture, there is an excellent opportunity for correlation. There is also an effort to correlate the science with home economics in the case of the girls. The students in mechanic arts work mostly upon farm equipment, although most of the laboratory cases and special equipment for teaching were made by the students. Considerable time was given one year to the making of models of barns and other buildings. The instructor did not think the work worth the time put upon it. He thought the time would have been better spent in making smaller buildings which would be of practical use upon the farm.

The teacher of English believes in basing her work upon the work of the farm and other interests of the students. Some of the papers required in the agricultural classes are corrected as to composition by the teacher of English. The students gain excellent practice in publishing a paper. "The Agriculturist of Baltimore County."

Practical work in agriculture.—Although there are 8 acres of land, it was not used to any great extent as a school farm when the school was visited in 1915. The elementary students used part of the farm as a school garden. A few fruit trees and a few small plats of grasses had been planted as a basis for some work in plant introduction and breeding. In 1917, when the school was visited again, the principal of the school was making a special effort to promote potato production in the community, and about half an acre of the school land was used for tests of varieties and methods of treatment.

The surrounding farms are used extensively for practical work. The classes in horticulture spray and prune the orchards on surrounding farms. Occasionally the class spends a day in Baltimore studying such problems as the marketing of dairy products or in visiting dealers in farm machinery and equipment. For practical work in dairying an arrangement was made with the local creamery to let students come in and secure practice in making butter and in handling milk and dairy products.

At the time the school was established, before the home-project plan was developed, each student was required to carry on an "experiment" at home. All of the students live at home on farms, school wagons and private conveyances bringing those who do not live within walking distance. The early idea of having these

students working out experiments at home has developed into something approaching the home-project plan, although there is no definite attempt to connect the home work with the instruction of the school or to give it adequate supervision. Projects as given in 1915 covered crop production, crop improvement, management of live stock, and farm management problems. A project may run through several years. Corn and potato projects are connected with the club work.

In connection with the course in farm management each student has made a survey of the home farm showing the size and shape of fields, the crops planted, and the location and arrangement of buildings. From the data gathered papier maché models were made showing elevation and slope as well as the size and shape of the fields, worked out to a scale with fair accuracy.

Equipment.—The basement of the buildings is equipped with laboratories for the work in science, home economics, and agriculture. Most of the special equipment in the agricultural laboratory is for somewhat technical exercises in soils and for testing dairy products. There was some farm equipment on hand, but little of it in use. A kerosene engine was used to run a cream separator and a feed mill, but the engine did not work well. A gasoline gas plant supplies gas for cooking, lighting, and laboratory purposes. Practical woodworking is conducted in the basement of the school building. No special metal work is given, although an outside shop is equipped with forges and anvils and such tools as a farm shop should have. Practice is given in the repair of farm equipment.

There is the beginning of a very good museum containing exhibits of seeds and other farm materials for use in the classroom. A stereopticon is used as an essential feature in visual instruction.

A fairly good library of agricultural books gives evidence that it is used. The students have bound many bulletins themselves. The teachers have personal files of bulletins which are used by the students.

Community work.—Inasmuch as the school had become somewhat widely known for the local extension work carried on by a former principal, it was rather to be expected that there would be a possibility of this work being carried on to a neglect of the regular school work. The principal is employed throughout the year and is expected to put in some of his time in extension work; he stated, however, that he considered his duty to his students first of all and that the work among patrons was but a secondary matter. Experi-

¹ See Crosby, D. J., and Crocheron, R. H. *Community Work in the Rural High School*, U. S. Department of Agriculture, Yearbook, 1910. 1p. 177-188.

ence had shown that it was very easy to develop distrust among the farmers and that they did not take kindly to any form of exploitation. It was not considered advisable to have the new instructor do any great amount of work among the farmers until he had been tried out and had developed local experience. The winter short courses for farmers and their wives and the work for rural teachers in the county, inaugurated under a former principal, had been discontinued.

BRISTOL COUNTY AGRICULTURAL SCHOOL, SEGREGANSET, MASS.

The citizens of Bristol County took advantage of the Massachusetts State law, passed in 1912, providing for the establishment of agricultural schools and departments under State aid. The school opened its doors for the year 1913-14 at Segreganset, a small village in the center of the county. The school has a delightful location on a farm of more than a hundred acres on the west bank of the Taunton River.

Purpose of the school.—The school disavows any intention of giving a general education or of fitting students for a higher institution. The prospectus of the school states "this is a school for the farmer's boy who intends to stay on the farm and for any other boy who wants to become an intelligent farmer." The school is more distinctly vocational in its aims and methods than any school of agriculture the author has visited. The law prescribed that students shall be between the ages of 14 and 25 years. No prerequisite schooling or entrance examination is required. Students must show evidence of sincerity of purpose and good moral character before they are admitted.

Course of study.

FIRST YEAR.

Credits.		Credits.	
Spelling	2	Kitchen gardening	1
English	2	Farm practice and shop work	2
Farm arithmetic	2	Project study	5
Agricultural botany	2	Project management and work	7
Woodlot management and ornamental planting	1		25
Small fruits	1		

SECOND YEAR.

Credits.		Credits.	
Spelling	2	Swine husbandry	1
English	2	General farm experience	2
Farm measurements and mechanics	2	Project study	5
Soils and soil fertility	2	Project management and work	7
Poultry husbandry	2		25

THIRD YEAR.

	Credits.		Credits.
English.....	2	Orcharding.....	2
Farm records and accounts.....	3	Project study.....	5
Insect study.....	2	Project management and work.....	7
Plant diseases.....	2		
Market gardening.....	2		25

FOURTH YEAR.

	Credits.		Credits.
English.....	2	Animal husbandry.....	2
Farm management.....	3	Project study.....	5
Farm crops.....	2	Project management and work.....	7
Seminar (subjects elective).....	2		
Dairying.....	2		25

Equipment.—The main building of the school was built at a cost of \$30,000, the second story not having been completed. The building has been equipped for teaching purposes at a cost of \$15,000. Although in practically open country, it is supplied with both water and gas. The school farm comprises 110 acres of land which is much better than the average of the county. In fact, some people have criticized the school because it gives practice to students under much better conditions than those which obtain at home. The land is a sandy loam partly on the river bottom, suitable for working early and late with a variety of crops. A very good dairy barn with two large silos has been built to replace one burned in 1915. This barn and other equipment of the farm, Mr. Gilbert, the director, claims to be within the reach of most progressive farmers in the county. An excellent herd of Ayrshires is being built up in spite of misfortune by way of fire and infectious disease. Both manure and machinery are protected by a long shed. The poultry plant consists of a long laying house, an incubator cellar, and a brooder house, in addition to a group of colony houses located on higher grounds which are used by students for individual projects. The farm is well equipped with modern implements and machinery.

Teaching staff.—The director is assisted by three men in addition to the county agent, who makes his headquarters at the school. All of the men have agricultural training. The director, G. H. Gilbert, although a practical farmer, conducted a commercial school, which may account for the emphasis given at the school on business training.

Practical work.—No outside labor is employed on the school farm. All of the work is done by students under the direction of the instructors. All students who enter without having had farm experience are required to spend two afternoons a week in "farm laboratory work." Before graduation, each student must have two seasons

on some good farm. This work is reported to one of the instructors who is given charge of the supervision of the students' work. Work done on farms other than the home farm of the students is classed as a "substitute for a project." At the time the school was first visited, May, 1916, over half of the 50 boys were working on substitutes for projects away from the school. Twelve to 15 students were boarding at the school. In many ways the school presented the appearance of a well managed farm. Students and instructors ate dinner together in their working clothes. There were individual projects and class projects being carried on in all the common branches of farming. Although the director aims to make the farm fully productive, as he believes it will then serve best for educational purposes, it is not managed as a commercial proposition. As a money-making venture, the farm would be devoted to one or two lines instead of being highly diversified. Although the chief aim is to give students practice in all phases of farming, the farm serves well for demonstration purposes to patrons as well as students. There are a number of highly specialized farms in the community to which the students are taken frequently. When an opportunity is presented to place a student upon one of these farms for the summer, it is taken even though the student is taken out of school before the end of the spring term. The character of the work done upon the school farm is good. During the spring of 1916 and the summer of 1917 when the school was revisited, crops and farm animals were in excellent condition. It is true, however, that certain items must be charged up now and then to educational experience given the students. For example, a number of rows of peach trees were nearly ruined in the school orchard when the spraying was left entirely in the hands of the students.

Methods of instruction.—As a rule the mornings are confined to the classroom, while the afternoons are spent on the farm and in the shop. Although some conventional class work is done, instruction in the school is largely individual.

In order to encourage habits of thrift each pupil is required to keep in permanent form an account of his personal receipts and expenditures from the day he enters the institution. In the same book he later opens a business account with his project. At any time he can determine his loss or gain.

The school has organized a savings bank along lines similar to the Massachusetts cooperative banks. This bank was established primarily to give business experience and to encourage the savings habit. The student's project, as a rule, will require a cash balance to draw upon until cash returns come in for produce sold. The bank also provides a loan fund available to worthy students in financing their projects.

The extent of the students' earnings is shown in the following table:

Year.	Number of boys.	Farm work.	Other work.	Total earnings.
1914.....	24	\$1,516.72	\$77.70	\$1,621.42
1915.....	47	4,858.45	651.80	5,510.25
1916.....	59	4,961.99	361.00	5,292.99

Extension work.—The cooperative agricultural extension work of the county, sustained by Federal and State funds, is under the direction of the school. One member of the faculty is assigned to spend all of his time in this work as county agent. All of the instructors do more or less extension work in connection with the supervision of home projects. Considerable time is given to the supervision of the boys' and girls' agricultural clubs of the county and in helping the teachers in the elementary schools to connect the club work with the instruction in agriculture. Farmers have been assisted in the cooperative purchase of supplies. The following record for one year will indicate the scope of this work: Ten carloads of lime, three carloads of seed potatoes, one carload of dairy cows, and several carloads of grain. The school has cooperated with local communities in holding fairs, and a number of special exhibits and meetings have been held at the school, including a county dairy conference, a Grange field day, a poultry day, and the county apple, corn, and potato show.

AGRICULTURAL DEPARTMENT OF HANNIBAL (N. Y.) HIGH SCHOOL.

Hannibal is a small village in the western part of Oswego County, N. Y., near the shore of Lake Ontario. It is in the midst of a section devoted to diversified farming and fruit growing. The principal of the school, S. R. Lockwood, who is also a farmer in the community, started a course in 1908 which he termed "academic agriculture." Although this course was of a very general and elementary nature, an effort was made to adapt it to the needs of the community. In 1911 State aid was given the school and an effort made to put the agricultural work on a vocational basis, although both boys and girls were taking the work. A year later home economics was added to the curriculum, leaving only boys to the attention of one teacher, with no other subjects. In 1914 the home-project plan was introduced. The school was visited in May, 1915, for the purpose of investigating the application of this plan to New York conditions.

Home projects.—The following projects were being worked out by the 20 students who were taking the course in agriculture:

1. Fruit.—One acre mixed orchard.
2. Poultry.—Improvement of home flock, introducing Rhode Island Red blood.
3. Poultry.—One pair turkeys.
4. Poultry.—Set 50 Plymouth Rock eggs in incubator. Not successful, trying it the second time.
5. Fruit.—Has set out one-fourth acre of berries.
6. Dairying.—Keeping a record of 10 cows.
7. Poultry.—Sixty-two Plymouth Rock and White Leghorn hens.
8. Fruit.—Three acres of pears; one acre mixed orchard.
9. Fruit.—Twenty-four pear trees.
10. Fruit.—Managing 4 acres of pears, 95 apple trees.
11. Poultry.—Seventy-five to 100 Buff Orpingtons; built new house.
12. Poultry.—Hatched 332 White Leghorn chicks from 450 eggs; had 302 May 10.
13. Potatoes.—One-half acre Irish Cobbler.
14. Fruit.—One-fourth acre red raspberries, also one-fourth acre lettuce and celery.
15. Poultry.—Setting hens and raising chicks.
16. Poultry.—Setting hens to build up flock.
17. Poultry.—Setting hens to build up flock and caring for a flock of 200.
18. Poultry.—Caring for flock of 58 hens.
19. Poultry.—Caring for flock of 55 Rhode Island Reds and White Leghorns.
20. Onions.—One-fourth acre.

Visits were made to the home of boys having representative projects.

The boy having project No. 8 had the management of 1 acre of old orchard and 3 acres of young pear trees. The orchard had been sprayed and the young orchard cultivated; so that the trees were in good condition when judged by the standards of the district. The boy's mother spoke well of the work of the school.

In project No. 10 a boy had the management of a large part of his father's old orchard. At the time of the visit it looked as if there would not be much in the way of returns to give encouragement to the boy. The trees were old; they had been planted too close together and had suffered from insect injury in previous years, so that there were very poor prospects for a crop. At the time of our visit the boy's older brothers were spraying the orchard.

The project listed last is one-fourth acre of onions grown by one of the younger students on rich bottom land. The crop had made no headway at the time of the visit, but the land had been put into excellent condition for the crop. If this project were successful it doubtlessly resulted in a larger area of onions planted on the farm.

A student living on a neighboring farm had an acre of onions the year before. By applying modern methods this student succeeded in securing 700 bushels which he sold at 50 cents per bushel. His entire cost of production, including rent of land, was \$99.69, leav-

ing him a profit of \$295.31 in addition to cash for 362 hours of labor. To accomplish this required the working out of a difficult problem: hence the project had a high educational value. It was found difficult to get the fine onion seed to germinate, as the winds shifted the light soil. A system of overhead irrigation was worked out which was not only helpful on this land but which was suggestive also of treatment for similar soils in the community.

AGRICULTURAL DEPARTMENT OF HOPKINS ACADEMY,
HADLEY, MASS.

History.—This school, known earlier as the Hopkins Grammar School, was established in 1664 with funds provided in the will of Gov. Edward Hopkins. Although the school is still known by the name given it in 1816, Hopkins Academy, it is one of the public high schools of the State, serving the village and town of Hadley. The agricultural instruction in this school is a national outgrowth of the attempt of a former principal, F. E. Heald, to adapt the course in general science to the interests of the students and the needs of the community. In 1912, a special teacher of agriculture was employed, the work given in the school qualifying at that time for State aid as an agricultural department in an existing high school.

The students.—There are two methods of admission: First, any pupil who has passed from the grades into the high school may elect to take the agricultural course; second, any person over 14 years of age who is to take up or has taken up farming may apply for admission to this department. His application will be given consideration in the light of preparation and attitude.

No girls have taken the course so far. Although there were never more than 10 students up to 1915, in that year the class reached a total of 24.

Course of study.—The number of students being relatively small, the classes in agriculture are combined and courses given in alternate years, as shown in the following table:

Beginning 1912, 1914, 1916, and other even years.

CLASSES I AND II.

Agricultural science and projects applied to Hadley.
Kitchen gardening:—Vegetables and small fruit.
Ornamental planting: Shrubbery, flowering plants, lawns.
Farm shop work: Making and repairing for home and school use—hotbeds, cold frames, etc.

CLASSES III AND IV.

Agricultural science and projects applied to Hadley.
Farm animals: Types, breeding, management.
Farm buildings: Sanitation and conveniences, plans, construction, upkeep.
Farm crops for keeping the animals, rotations, balancing, cultivation, etc.
Farm machinery and implements, their use and repair.

Beginning 1911, 1913, 1915, and other odd years.

CLASSES I AND II.

Agricultural science and projects applied to Hadley.
 Small animals: Poultry, sheep, swine, bees—types, breeding, management, rations, etc.
 Buildings and equipment for small animals—plans, cost, etc.
 Home-grown crops for small animals—kinds, quantities, seeds, soils, fertilizing, tillage, harvesting, storage.
 Farm shop work and other construction.

CLASSES III AND IV.

Agricultural science and projects applied to Hadley.
 Fruit growing: Orcharding and small fruits not before dealt with.
 Market gardening: Markets, soils, seeds, fertilizers, tillage.
 Buildings and appliances, plans, devices, implements and machines, cost, use, and upkeep.
 Farm shop work and other construction.

Home-project work.—The school was visited by the author on May 18, 1916, for the special purpose of studying the home-project plan in operation. The principal of the school seemed very much interested in the work in agriculture and was so much in favor of the home-project method that he was conducting his own garden as a home project under the direction of the teacher of agriculture, from whom he frequently sought advice. The 16 boys who were in the agricultural work at that time all lived comparatively near the school and all had their projects at home except one who had his onion project upon the school grounds. The projects for the summer of 1916 were as follows:

1. 15 fruit trees, one-fourth acre onions.
2. 10 fruit trees, one-tenth acre onions.
3. 25 fruit trees, one-tenth acre onions, 55 hens.
4. 15 fruit trees, one-tenth acre onions, 6 hens.
5. 1 acre corn, one-tenth acre onions, one-tenth acre berries.
6. 1 acre corn, one-tenth acre onions, 8 fruit trees.
7. 1 acre corn, 9 fowls, 30 fruit trees.
8. One-fourth acre potatoes, 60 currants, 24 fruit trees.
9. 1 acre corn, 60 currants, 22 fruit trees.
10. One-half acre corn, one-seventh acre berries, 25 fruit trees.
11. One-fourth acre potatoes, 33 fruit trees, 12 pullets.
12. One-fourth acre onions, one-half acre potatoes, 5 fruit trees.
13. One-twentieth acre kitchen garden, 6 hens, 50 ducks, 1 pig.
14. One-twentieth acre potatoes, 15 fruit trees (works also on poultry farm).
15. One-half acre mangels, 2 acres corn (continues dairy work of last year's project).
16. One-fifth acre kitchen garden, 7 hens, 32 chicks (takes care of 5 horses and 1 cow).

It is interesting to note that although the school owns a little agricultural land, it is turned over to one of the students for an individual project rather than used by the class as a whole. There are numbers of farms within a short distance, however, and an abundance of teaching material within reach of the school. A flock of fowls

is kept at the school and an incubator and brooder were in operation, the students doing some of the work. Pure-bred fowls and eggs are furnished students at a nominal price after interest in better stock is aroused through their projects. Two of the students' poultry projects were visited. In both cases the students needed the stimulation of a visit from the instructor, as the poultry had been somewhat neglected in the pressure of spring work connected with the production of onions and tobacco.

Classroom instruction.—The work of the classroom consists of a good deal of individual project study and informal round table discussions, most of which are based upon a study growing out of the home projects. A combination laboratory and classroom lends itself very well to this form of instruction. Double periods are used at all times. The work for the day may be a combination period of supervised study and recitation, a field trip, or a class practicum. A small library of selected books and bulletins in good working order gave evidence of considerable use. A stereopticon with sets of slides, charts, and collections of seeds and other agricultural products were used as illustrative material. Appropriate pictures on the wall gave evidence of the purpose for which the room was used. Other material aided in giving the room an agricultural atmosphere.

Most of the students taking the agricultural course are sons of hardworking farmers. A number of them could not attend school were it not possible for them to engage in productive labor at the same time. All of the projects are put upon a productive basis and the students encouraged to do other farm work that will add to their incomes. Accurate records are kept of the work done and the cash received. The following table shows the results of the past four years:

Year.	Number of boys.	Farm work.	Other work.	Total earnings.
1913.....	9	\$1,891.98	\$301.80	\$2,193.46
1914.....	8	1,070.95	168.28	1,239.23
1915.....	24	3,389.27	204.85	3,594.12
1916.....	21	4,087.48	146.00	4,233.48

During the year 1916 the students in this school received a total of \$278.75 as prizes for project products exhibited and judging contests.

Local extension work.—The work of the agricultural instructor in supervising the home projects of the students brings him into direct contact with the farmers of the community and their problems. Advice is sought and given as a matter of course. Inasmuch as Hadley is within a few miles of Amherst, the seat of the State agricultural college, the instructor may easily secure aid in connection

with problems beyond his power. E. J. Burke, the present instructor, is especially well qualified for work among boys and girls. All of the boys and girls met seemed to greet him with a smile. He has been given charge of the club work conducted among the younger children and is assisting the teachers in the elementary schools to connect their classroom instruction more closely with the practical club work conducted at home. Special success has been attained in such cooperative effort with the rural teacher at Russellville.

As a means of teaching the students practical pruning and spraying, the orchards of the community are used. A farmer's orchard may be sprayed or pruned as a demonstration to him, at the same time affording practice to the students, but after the students have learned how to do the work they must receive pay for their work which is done outside of school hours. In one or two cases, orchards which are a menace to the community as sources of infection have been sprayed each year by the students.

DEPARTMENT OF AGRICULTURE, STATE NORMAL SCHOOL, PLATTEVILLE, WIS.

Since the department of agriculture was established in connection with the Platteville State Normal School, in the fall of 1914, it has had a steady growth, so that to-day it represents one of the strong normal-school departments of agriculture in the United States. As the school is serving in the general training of farmers in the community as well as in the training of teachers, its organization and methods should be suggestive to high schools as well as normal schools. The purpose of the instruction given may be gleaned from the following, printed under the title, "Our educational creed":

We believe that the purpose of the department of agriculture of the Platteville State Normal School is to train students to use the materials of a farm for their highest educational advantages, to equip students to unify the interests of the home and the school, and to promote all of the interests which make for the establishment of permanent agriculture in southern Wisconsin. In this way it fits students for identification with the moral and social forces of the country working for its betterment.

We further believe that culture will not suffer by evolving it through the material affairs of man, a study of the soil it may be. We also believe that the education that is most worth while teaches vocational efficiency, the power of problem solving, general intelligence, and the right moral attitude in relation to the useful activities of everyday life.

Finally, we believe that the purpose of the department is to prepare teachers who are intelligent as to the affairs of the farm, who see dignity in its manual labor; yea, see in it the finest and most effective opportunities for training in responsibility and in the reward of success that comes from faithful application and attention to duty.

Organization and equipment.—As the school aspires to train teachers for high schools as well as elementary teachers, it is de-

veloping a staff of instructors and rather extensive equipment. At the time the school was visited, in the summer of 1917, the department was under a director of agricultural education assisted by two instructors, one of whom had charge of the school farm. A new agricultural and manual arts building was nearing completion. This brick building, with two stories and a basement, should provide room for classes, laboratories, and shops for the vocational work for some years to come.

The school farm consists of 26 acres of limestone soil typical of the section of southwestern Wisconsin in which the school is located. The farm is divided into three tracts. The first tract of 15 acres is used for demonstrating systematic rotation of crops and other modern practices in crop production. No experimental work is attempted. The second tract of 8 acres is used in a rotation of forage crops for the maintenance of live stock at the school. A third tract of nearly 3 acres contains a cottage for the farm manager, poultry houses, a small orchard, a school garden of half an acre, 1 acre for truck crops. The school garden is used by the pupils of the training school maintained in connection with the normal school. The remainder of this plot is used as an out-of-door laboratory in connection with the instruction in agriculture. The farm also furnished material for inside laboratory work and classroom instruction. The farm has a good team of horses and farm implements and machinery suited to a small farm in Wisconsin.

A modern dairy barn is planned with the idea of maintaining one dairy cow for each acre of land. The product of these cows will be sold as market milk and cream in Platteville. The students will be expected to do all the work. As the school is located in a dairy section, dairy husbandry is emphasized. The idea of maintaining a dairy herd is to give practice in milk production under conditions approaching the ideal, yet within the reach of the farmer. Cows have not been purchased to represent the dairy breeds to be used in judging. Instead of spending money for that purpose, the school has purchased a truck fitted as a van to accommodate a class of about 20 students. In the community there are excellent dairy herds representing the four leading breeds, and pure-bred draft horses, sheep, and swine. If there is to be a lesson in breed types or practice judging, it is a relatively simple matter for the teacher to take the class out to a neighboring farm.

When the school was visited early in July the school garden and all the field plots were in excellent shape. The farm was then being used in connection with the summer school.

Courses of study.—The department of agriculture acts as a service department in giving one or more courses in elementary agriculture to each prospective teacher enrolled in the rural-school department.

In 1916-17, 50 young women received such instruction. The department also offers a general institute or short course of one week in December and a winter course of nine weeks for young men who can not attend the regular school session. A correspondence course in agriculture is also offered.

To students regularly enrolled for agriculture the department offers three courses. The nature of these courses will be seen from the following outlines taken from the department circular:

Two-year course for high-school graduates.

FIRST YEAR.

FIRST SEMESTER.		SECOND SEMESTER.	
	Hours.		Hours.
Animal husbandry.....	5	Physics.....	5
Weeds.....	2	Horticulture.....	3
Chemistry.....	5	Psychology.....	5
Insect pests.....	2	Plant physiology.....	2
Plant diseases.....	1	Blacksmithing and cement con-	
Farm carpentry.....	3	struction.....	3
	18		18

SECOND YEAR.

Agricultural education.....	5	Agricultural bacteriology.....	2
English composition.....	5	Dairying.....	3
Farm mechanics.....	5	Farm arithmetic.....	5
Soils.....	5	Crops.....	5
Teaching.....	5	Teaching.....	5
	25	Physical training.....	2
			27

Three-year course for high-school graduates.

FIRST YEAR.

FIRST SEMESTER.		SECOND SEMESTER.	
	Hours.		Hours.
Animal husbandry.....	5	Physics.....	5
Chemistry.....	5	Psychology.....	5
Weeds.....	2	Plant physiology.....	2
Insect pests.....	2	Horticulture.....	3
Plant diseases.....	1	Blacksmithing and cement con-	
Farm carpentry.....	3	struction.....	3
	18		18

SECOND YEAR.

Agricultural education.....	5	Physiography.....	5
English composition.....	5	Crops.....	5
Farm mechanics.....	5	Farm arithmetic.....	5
Soils.....	5	Advanced civics.....	5
Poultry.....	5	Physical training.....	2
	25		22

THIRD YEAR.

Hours.	Hours.
Agricultural economics ----- 5	Agricultural bacteriology ----- 2
Algebra ----- 5	Dairying ----- 3
Teaching ----- 5	Trigonometry and surveying ----- 5
School administration ----- 5	Teaching ----- 5
----- 20	Elective ----- 5
	----- 20

Five-year course for graduates of the eighth grade of the elementary schools.

FIRST YEAR.

FIRST SEMESTER.	Hours.	SECOND SEMESTER.	Hours.
Arithmetic ----- 5		Algebra ----- 5	
Geography ----- 5		American history ----- 5	
Reading ----- 5		Grammar ----- 5	
Elementary agriculture ----- 5		Vegetable gardening ----- 5	
----- 20		----- 20	

SECOND YEAR.

Algebra ----- 5	Plane geometry ----- 5
Civics ----- 5	Music ----- 5
Composition ----- 5	Zoology ----- 3
Physiology, hygiene, and farm sanitation ----- 5	Bees and beekeeping ----- 2
----- 20	Composition ----- 5
	----- 20

THIRD YEAR.

Elementary physics ----- 5	Physiography ----- 5
European history ----- 5	European history ----- 5
Solid geometry ----- 5	Literature ----- 5
Poultry ----- 5	Farm practice ----- 5
----- 20	----- 20

FOURTH YEAR.

Animal husbandry ----- 5	Physics ----- 5
Chemistry ----- 5	Psychology ----- 5
Weeds ----- 2	Plant physiology ----- 2
Insect pests ----- 2	Horticulture ----- 3
Plant diseases ----- 1	Blacksmithing ----- 3
Farm carpentry ----- 3	Cement construction ----- 2
----- 18	----- 20

FIFTH YEAR.

Agricultural education ----- 5	Agricultural bacteriology ----- 2
English composition ----- 5	Dairying ----- 3
Farm mechanics ----- 5	Farm arithmetic ----- 5
Soils ----- 5	Crops ----- 5
Teaching ----- 5	Teaching ----- 5
----- 25	----- 20

COURSES IN AGRICULTURE.

1. Elementary agriculture.

This course is an introduction to the later differentiated courses in agriculture. In an elementary way, students are given familiarity with farm animals, farm crops, soils, weeds, insects, dairying, etc. The school farm and garden furnish the out-of-door laboratory.

2. Vegetable gardening.

The main purpose of this course is to teach students to operate successfully their home gardens. Some of the topics presented in classroom instruction are the purposes and values of home gardens, the ordering of seed catalogues, the selection of vegetables and the best arrangement of them in the garden, the ordering and testing of seeds, the making of a planting calendar, the construction and operation of a hotbed, the cultivation and protection of garden truck against noxious insects and plant diseases, and the best methods of harvesting, marketing, and preservation of products from gardens. The practical work is done in the home gardens.

3. Physiology, hygiene, and farm sanitation.

In the production of healthy folks there are two considerations: The individuals themselves and their surroundings. The first part of the course deals with the development of sanitary and hygienic habits, and the second part with the proper construction and management of the farmhouse to insure proper heating, ventilation, lighting, cleanliness, sewage disposal, etc. Some time is given to the sanitary housing of farm animals.

4. Bees and beekeeping.

Wisconsin is one of the States in the front rank in the production of honey. In this course, which is a supplement to the course in zoology, students are taught the varieties of bees and the life history of each sex in a hive, the conditions that favor the production of a maximum amount of honey, the structure of a hive, the summer and winter care of bees, the control of insect and fungous enemies, and the marketing and uses of honey. The apiary on the school farm furnishes the concrete materials for the course.

5. Poultry.

This course deals with the description of breeds and varieties of poultry; the production and marketing of eggs; the fattening and marketing of poultry; fall, winter, and summer care; incubation and brooding. Actual practice in poultry management is given in the poultry ranges of the school farm.

6. Farm practice.

Students taking this course will assist in the regular farm operations under the direction of the farm manager, who will instruct

the students as to the practical application of the scientific principles of agriculture. Some of the operations which will be taken up are: Care and feeding of horses, cattle, swine, and poultry; such field operations as plowing, harrowing, disking, drilling grain, planting potatoes and corn, and application of manure and other fertilizers; and miscellaneous operations as gardening, caring for small fruit, and orchard practice.

7. Animal husbandry.

The first part of this course treats of the types and breeds of horses, cattle, swine, sheep, and poultry. The origin, improvement, introduction to this country, and the characteristics of each breed are emphasized. A thorough study is made of the relation between the form or conformation of the animal and its purpose. After the development of these principles, standard score cards are used in judging stock in Platteville and vicinity. The second part of the course considers the compounds of animal nutrition; the digestion and assimilation of food; the excretion of wastes; the nutrient values of such feeds as ensilage, straws, roots, tubers, grains, and seeds; the proper care in preservation of farm feed; and the compounding of balanced rations for special results in particular types of animals. If students come from the farm, they will be encouraged to interest home folks in conducting feeding experiments. Feeding statistics will be collected from local experimenters, for study and interpretation.

8. Weeds.

This course makes the student acquainted with the weeds of the farm and garden; the root, stem, fruit, and seed characteristics that facilitate their dissemination; the best method for eradicating each weed, such as cultivation, rotation, and spraying; and the different farm crops. Each student is required to make an herbarium of the weeds studied, and a collection of their seeds.

9. Insect pests.

This course involves a study of the external structure, classification, and local distribution of insects; a consideration of insects in their relation to farm products, more especially horticultural products; the life history and habits of injurious and beneficial species; collecting, identifying, and mounting some of the most common insect pests; general and special methods of control; and practice in the preparation and application of control measures.

10. Plant diseases.

The annual damage in this country in the destruction of crops by plant diseases is about \$500,000,000. In this course the student is made acquainted with the bacteria and fungi that are responsible for

the common diseases of farm crops, the use of resistant strains, and the composition and application of fungicides.

11. Plant physiology.

In this course the life processes of the plant, as far as possible, are interpreted in terms of physics and chemistry. The emphasis in the study of these life processes will be with the plants of the highest order, the seed plants. The development of the subject takes this order: The study of the plant cell; the intake of materials by the plant through the forces of imbibition and osmosis; the outgo of plants through transpiration, guttation, and secretion; the translocation of food materials; the study of food necessary for the nutrition of plants; the synthesis of carbohydrates, proteins, and fats; independent versus dependent plants; the digestion and assimilation of foods; and respiration and fermentation, the two great phases of destructive metabolism in the plant. The structure of the plant will be emphasized only as it is necessary to understand its physiology.

12. Horticulture.

This course is designed to give the pupil a knowledge of the planning, planting, and cultivation of the home vegetable garden; the care and management of small fruits and their adaptation to Wisconsin soils and climate; practice in the construction of hotbeds and cold frames; laboratory work in planting and cultivating the school garden; pruning and spraying of orchards in the community; and judging and scoring fruits and vegetables.

13. Agricultural education.

This course has for its object a consideration of the specific purpose of agricultural instruction in its relation to the general aims of education; a discussion of the organization of agricultural courses for high schools; the proper use of the school garden or the school farm; the unification of the interests of the school and the home through home project work, short courses in agriculture, social center work, farmers' institutes, and high-school fairs. This course also includes a study of the teaching process in relation to accepted sociological, biological, and psychological principles.

14. Soils.

This course offers instruction in the origin and composition of soils; methods of measurement of their varying physical conditions; the relation of texture of different types of soils and water content to the best time for cultivation; the history of the mineral nutrient theory; the source, loss, and ways of restoration of each of the 10 essential elements, with particular emphasis on the elements, nitrogen, phosphorus, potassium, and calcium; the use of fertilizers; and the work of bacteria in making available the food materials to the plant.

Experiments will be performed in the laboratory and on plats to determine the water-holding powers of different soils, the capillary movements of waters under different conditions, and the possibility and different methods of conserving soil moisture.

15. Agricultural bacteriology.

In this course the students are made acquainted with the principles that underlie the science of bacteriology. Drill in the technique of bacteriological study is given to determine the structure of certain representative bacteria of characteristic groups, and to note their effects on various culture media. After this preparation students make bacteriological examinations of water, soil, milk, and butter.

16. Dairying.

Since the major interest of the people of this community is dairying, much is made of this industry. Sanitation in the production, transportation, and distribution of milk is emphasized. Excursions are taken to inspect the equipment and methods of dairy practice, butter making and cheese manufacture. Careful determinations are made of the amount of butter fat, casein, albumen, sugar, and ash in milk. Students from farms are encouraged to improve dairy herds by enlisting the cooperation of their home folks in keeping records of daily milk production, and by making regular laboratory tests of butter fat in the milk. As soon as the dairy laboratory in the new building is available students will receive training in the pasteurization of milk and cream and the making of butter and cheese.

17. Crops.

The study of crops includes a consideration of the origin, botanical characters, the leading types, and varieties of the leading crops of this region; the preparation of the soil, planting, methods of cultivation, systems of rotation, harvesting, food values for man or animals, and principles and methods of breeding. Corn and grains are judged by the methods recommended in Wisconsin. The plant and seed characters of the different crops are acquired through laboratory study. Variety tests and some of the best methods in crop production are demonstrated on the school farm. Excursions are taken to show the effects of soil, methods of cultivation, and rotation on the different crops.

Methods of instruction:—In connection with using the school truck an effort is made to utilize the resources of the community for teaching: Pruned 238 apple trees, 32 currant, 12 raspberry, and 21 goose. In dairy husbandry spent several days as an apprentice in the Platteville creamery as a part of his course. Some of the students gained such proficiency in this work that one of them was retained by the

local creamery at a good salary for the summer, while others received good positions in near-by creameries, upon recommendation of the manager. The work in horticulture was made equally as practical. In the spring of 1916 the class accomplished the following: Pruned 238 apple trees, 32 currant, 12 raspberry, and 21 gooseberry bushes, and 19 shade trees; sprayed 150 trees; treated seed oats for smut; made the hotbeds and took charge of the vegetable garden on the school farm. The students have built the poultry house and a shed for the farm machinery. In making hotbeds and farm buildings the work is in cooperation with the department of manual training, the courses of which are taken by the students in agriculture. There is an organized effort made for cooperation and correlation of subjects in other lines, particularly with the science courses and in English.

Local extension work.—In addition to offering short courses and correspondence courses in agriculture, the department staff give lectures on agriculture and rural life before farmers' institutes; farmers' clubs and rural social centers. Students give assistance to the rural schools and to boys' and girls' clubs in such practical work as construction of hotbeds and aid teachers in giving special lessons. In addition to pruning and spraying of trees, they have tested seed and milk and have treated oats for smut and potatoes for scab. The instructors have also assisted in community fairs.

Results.—The results of the local extension work is that the school "takes well" with the farmers of the community, and the demand for help is beyond the power of the department to satisfy. Although the department had been in operation but three years, when visited in 1917, it had trained 41 young men as teachers of agriculture. The enrollment of the regular agricultural students had increased from 24 the first year to 39.

Much of the success of the department is due to its director, Fred. T. Ullrich, who although trained primarily as a teacher of science has adapted and applied his scientific training to educational and agricultural problems in southwestern Wisconsin.

THE BERRY SCHOOL, MOUNT BERRY, FLOYD COUNTY, GA.

The history of the Berry School, although one of the most interesting chapters in the development of the South, is too long a story to relate at this time. The scheme grew out of an effort on the part of Miss Martha Berry to broaden the lives of the people living near her in the mountain section of Georgia. A start was made with a Sunday school in a little log cabin. The school proper was opened in an unpretentious way in 1902. To-day the school owns over 5,000 acres of land, a score of buildings with equipment reaching into several hundred thousand dollars, and is taking care of several hundred

farm boys and girls. The school is still a private institution incorporated under the laws of Georgia. Although it has a considerable endowment, it is dependent upon the bequests each year for its running expenses, the income from the fees and labor of the students being inadequate. Although the Berry School for Girls is a separate institution from the Berry School, which is for boys only, the two are on the same grounds and under the same management, hence they will be considered together.

Purpose of school.—A visit to the school impresses one with the air of industry and the lack of the aristocratic atmosphere which prevails in many of the private schools of the South. The reason for this is in the nature of the students selected and the dominating purpose of the school, which is "to develop efficient Christian manhood by affording to worthy boys and young men of limited means from rural districts the opportunity to earn an education combining mental, moral, and industrial training." Candidates for admission must "(1) live in the country; (2) have attained the age of 16 years; (3) be financially unable to attend school elsewhere; and (4) furnish evidence of physical, mental, and moral soundness." All students are required to do at least 16 hours of work a week. Students who do not take kindly to work are not allowed to remain at the school. All of the work, including the erection of many of the buildings, is done by the students. A needy student may remain at the school working for pay during the summer, although students are not encouraged to remain at the school over 20 months in any one continuous period. The school affords a wonderful opportunity to young men who are willing to work, an opportunity to secure training toward efficiency in workmanship and at the same time to be directed in physical, mental, and moral development which should mean much to the northwestern section of Georgia. The history of the graduates of the school will show that it has meant much not only to Georgia but also to other sections of the South in sending forth inspired leaders who know how to do things. It is interesting to note the student body and the contrast between the incoming students and those about to graduate.

Work in agriculture.—Although the school gives general industrial training for rural life, it is more nearly an agricultural school than many of the special schools of agriculture. It is the aim of the director to make it more and more an agricultural school. In 1917, when the school was visited, agriculture was organized as a division coordinate with mechanics, academic subjects, and administration.

Of the 5,000 acres of land owned by the school, about 60 are used as a campus, 1,000 are under cultivation, 500 used as pasture, and the remainder in woodland. All of the agricultural land is in charge

of the department of agriculture. The farm is equipped with modern buildings and machinery, including a hothouse and an up-to-date dairy. At the time the school was visited students were working on extensive poultry buildings. The live stock consisted of 100 head of dairy stock, including calves and heifers, 200 head of swine, 150 sheep, 14 mules, 6 horses, and a flock of poultry.

While the farm is operated as a money-making venture, educational values are not lost sight of. The use of student labor is not a serious problem, because two of the essential points in selecting students is that they shall want to work and need to work. Each student is required to work approximately 16 hours a week. Additional work with pay is given needy students. The pay depends upon the character of the work done. As the farming is done on an extensive scale, using modern machinery and methods, most of the farming operations afford new experience to the students, many of whom come from little "one-mule" farms in the mountains.

The following account of a day's work at the school will indicate something of the manner in which the school is conducted:

The active day at the Berry School begins early. At 4 o'clock the kitchen fireman arises and goes to build the fires in the ranges. A half hour later the cooks and the morning dairy squad go to their work. The latter milk the cows and bring the milk from the barn to the dairy house before breakfast, which comes at 6.30.

Meanwhile, the full-time farm boys, who are working one term in order to pay for their board and tuition the next term, have arisen, eaten breakfast, and gone to their work by 6 o'clock. The students arise at 6 o'clock and have breakfast at 6.30.

At 7 o'clock the real work of the school day begins, and lasts until 5 o'clock in the afternoon, with intermission for chapel and dinner. The school is divided into three groups as nearly equal in size as possible. Each day two of these groups attend classes, while the third works for eight hours. A few students, however, have assigned work at other times. From 4 until 5.30 o'clock in the afternoon is recreation period. This is the time for games, exercise in the gymnasium, reading, or other recreation for those not on duty.

Supper is served at 5.30, followed by evening prayers. At 6.30 on school days the evening study period begins, lasting until 9.05. During this time each student must be in his room and studying. A relaxation period is given from 9.05 to 9.30. At 9.30 silent time begins, and at 10 lights go out and everyone is in bed except the night watchman, who still has to make his rounds.

On Saturday there is a social hour instead of the study hour, and on Sunday church services and Sunday school instead of the regular routine.

In order to accommodate an additional number of boys who desire to work their way through school, a farm of 500 acres is being developed about 5 miles from the main school at the foot of Mount Lavender. Here about 25 boys, for the work done for four or five months, are given credit for board and tuition at the regular school. While doing this farm work for the purpose of getting a start to-

ward their regular schooling they are given instruction five nights a week in agriculture, arithmetic, English, reading, and spelling.

Near the school a model farm is operated, under the direction of a former student, as a demonstration to the pupils and people in the community. Students also assist in the work of this farm.

As suggested, the girls live and have their schooling apart from the boys. Agriculture and other industrial work form a large part of the curriculum of the girls' school. When the school was visited the girls were taking entire charge of six dairy cows and making a part of their product into butter and cheese. The cows and the stable were in excellent condition, in better condition than the main dairy at the boys' school. The garden of 4 acres was also in better condition than the main truck gardens of the schools. The girls were proud of their showing on the farm, as they were of the excellent rugs and baskets they were making.

Although some agriculture is required in all of the courses for boys and girls, the following course is offered for students who desire agriculture in the four-year high school.

<i>Freshman.</i>		<i>Sophomore.</i>	
	Hours.		Hours.
*Agriculture	4	*Agriculture II.....	4
*Bible II.....	2	*Bible III.....	2
*English V.....	4	*English VI.....	4
Gymnasium.....	2	Gymnasium.....	2
*History II.....	4	*History III and civics II.....	4
*Mathematics V.....	4	Mathematics VI (fall term)....	4
Mechanics III (fall term).....	8	*Mechanics IV.....	8
Science III.....	5	Science IV (spring term).....	4
Singing.....	2	Singing.....	2
Spelling.....	2	Spelling.....	2
		Writing.....	2
<i>Junior.</i>		<i>Senior.</i>	
*Agriculture III.....	4	*Agriculture IV.....	4
*Bible IV.....	2	*Bible V.....	2
*English VII.....	4	English VIII (spring term)....	4
Gymnasium.....	2	Economics.....	4
*History IV.....	4	Mathematics VIII and IX.....	4
Mathematics VII.....	4	Music.....	2
*Mechanics V.....	8	*Science VII.....	6
Music.....	2	Spelling.....	2
*Science VI.....	6	Writing.....	2
Spelling.....	2		
Writing.....	2		

* Subjects required.

HIGH SCHOOL COURSES IN AGRICULTURE.

Agriculture I (farm crops).—For freshmen in the high school. A general course in agriculture bearing on: The soil—general classification, elementary composition of plants and their sources of supply, sources of nitrogen, phosphoric acid and potash: relation of the soil to plants; plant analysis. Plants—general classification, duration of life, how they grow, feed and produce, sexuality, crosses and hybrids. General field crops—horticulture and gardening; forestry; applied botany. Text used: Southern Field Crops, by J. F. Duggar, and Southern Gardeners' Manual, by J. S. Newman.

Agriculture II (animal husbandry).—For sophomores in high school. This course is designed to take up in detail animal life on the farm and treats: The importance of the subject, breeds of horses, cattle, sheep, poultry, and swine. Animal type, judging, heredity, breeding, selection, pedigrees, feeding, care, equipment, meat on the farm, preserving eggs, bees and honey. Text used: Beginnings in Animal Husbandry, by C. S. Plumb.

Agriculture III (dairying).—For juniors in high school. A practical course in this important subject treating on: The origin of domesticated cattle, the dairy type and breeds, starting a dairy herd, selection of cows and bulls, calf raising, development of the dairy heifer, management of dairy cattle, feeding for milk production, stables for cows, handling of manure, common ailments of cattle, milk records, testing milk, butter making, and milk as a food. Text used: Dairy Cattle and Milk Production, by C. H. Eckles.

Agriculture IV (farm management).—For seniors in high school. The farm as a business enterprise and as an avocation, personal characteristics desirable in a farmer, profits to be expected from farming, cost of living on farms, some thoughts for the farm boys, types of farming, maintaining the fertility of the soil, capital, methods of renting land, farm labor, farm equipment, farm layout, rotation, marketing, farm records and accounts, some successful farms. Text used: Farm Management, by C. F. Warren.

Farm mechanics V (mechanics).—This course, for high-school pupils, consists of a detailed study of field machinery, farm power and transmission devices; the operation, care, and maintenance of such machinery being studied thoroughly. The following list will serve as an index to the work covered: Plows, stalk cutters, harrows, manure spreaders, fertilizer distributors, planters, mowing machines, rakes, binders, ensilage cutters, steam engines and boilers, gas engines and the farm tractors. Text: Farm Machines and Farm Motors, by Davidson and Chase.

In all of these courses a textbook sequence is not followed closely. An effort is made to use the farm and shops as a laboratory and to use a seasonal sequence in the classroom that the classroom lesson

may be correlated with farm practice. An effort is made also to correlate agriculture with other subjects, as will be seen from the description of a course given to students before they enter the regular high-school courses:

Country Life.—For fourth year grammar school. The aim of this course is to take the everyday activities of the boys on the farm and make these the basis for arithmetic, science, and agriculture. For example: The institution sells a beef to a butcher in Rome. The arithmetic work for the day is based on the business operations involved in the sale of the beef and the buying of feed with part of the receipts. The beef is sold on foot at 7 cents per pound. There is first a discussion as to why it does not bring 7½ cents, which is the top of the market for this day. The good points of beef are brought into consideration. Cotton-seed hulls, bran, and shorts have been purchased. The price of each is stated. It appears that the price of the cotton-seed hulls was much higher. The reasons are ascertained. The relative food value of the three feeds is discussed, as are the reasons for mixing them in the ration.

Very likely the second part of the lesson for the day is devoted to gathering the corn from a plot in which an ear-row test has been made by the boys during the summer. The corn is husked, sacked, and weighed and the result of the experiment determined.

Most of the boys in this class have studied very little arithmetic in the rural communities from which they come. The practical way in which arithmetic, agriculture, economics, and current events are blended enables the quick assimilation of what otherwise would be dry and indigestible material. No definite textbook is used during this year, but the students are encouraged to accumulate and read bulletins on the subjects discussed in class.

Weekly excursions to various farm activities through the first three years of grammar school are conducted by the instructor, which serve as a basis for the more advanced work in the fourth year.

THE MANASSAS INDUSTRIAL SCHOOL FOR THE TRAINING OF COLORED YOUTH, MANASSAS, VA.

This institution is typical of a relatively large number of smaller schools maintained by northern philanthropists for Negroes in the South. This school is located near the historic Bull Run battlefield, near Manassas, which is the seat of Eastern College and one of the district agricultural schools of Virginia. Although the school may be classed as a secondary school, elementary instruction is given. The following from the school circular suggests the primary purpose of the school:

The aim of the school is to train for useful lives those boys and girls who from necessity or desire must enter as early as may be into some self-supporting occupation. It aims to teach Negro youth the need and importance in a democratic society of all kinds of useful labor intelligently done and as far as possible to send them back to their homes efficient teachers and leaders in industry and civic welfare. Through work as well as through books it aims to teach the value and dignity of work. The students attend to the upkeep and care of the school's 200-acre farm, the farm implements, the stock, the dormitories and cottages. . . . Particular stress is laid upon the study and

practice of agriculture and upon the adequate training and preparation of teachers for the colored elementary rural schools. But whatever course, the aim is not alone to make young men and women craftsmen; the aim is to make craftsmen better men and women.

Courses of study.—Students must be 14 years of age upon entrance. It is considered essential for the student to have the equivalent of elementary school training before entering the industrial courses, hence students who have not had this preparation are required to take a preparatory course in the elementary subjects. Although there is fairly good equipment for woodworking and ironworking and other industrial training given in addition to blacksmithing and carpentry, this training does not enter into the agricultural course as will be seen from the following:

Outline of the agricultural course.

[Figures indicate the number of 45-minute periods a week.]

FIRST YEAR.		SECOND YEAR.	
	Periods.		Periods.
American history.....	3	Agronomy.....	3
Arithmetic.....	3	Botany.....	2
Botany.....	2	Chemistry of soils.....	2
Chemistry (elementary).....	2	Dairy husbandry.....	2
Field practice.....	33	Field practice.....	33
Language.....	5	Grammar.....	5
Military drill and athletics.....	3	Literature.....	5
Reading.....	5	Military drill and athletics.....	3
Supervised study.....	15	Poultry husbandry.....	2
		Supervised study.....	14
THIRD YEAR.		FOURTH YEAR.	
	Periods.		Periods.
Accounting.....	3	Commercial geography.....	2
Algebra.....	5	Composition and rhetoric.....	5
Animal husbandry.....	4	Farm management—Land tenure.....	3
Field practice.....	32	Field practice.....	30
Grammar and composition.....	5	Geometry.....	3
Military drill and athletics.....	3	Military drill and athletics.....	3
Physics.....	3	Rural economics—Sociology.....	3
Supervised study.....	14	Supervised study.....	22

Instruction in agriculture.—The agriculture of the classroom is supplementary to farm work. For much of the farm work wages are paid. Several acres of the farm are turned over to the students to use as individual garden projects. The school was visited two different years, each time the garden plots being in excellent condition and paying a profit to each student. To be sure, the plots were not all cared for equally well, and while the profit was small in some cases, all students were stimulated by the hope of a financial reward. It was interesting to note the difference in attitude toward farm work

on the part of the colored students and the white students in the same town. The 200 acres at the colored school were kept in good condition and were a source of considerable revenue to the school, the work being done largely with student labor. At the district agricultural school the school owned five acres for instructional purposes. Although a part of the garden was planted by the students, the care of the school land was given over mostly to the janitor, who already had more than he could do well.

As most of the produce of the farm is used at the school, the students learn much in storing and preserving food for winter use. One year the following products were canned: Five hundred gallons of tomatoes, 120 gallons of peaches, 75 gallons of pears, 70 gallons of peas, 40 gallons of sauerkraut, 40 gallons of mixed pickles, 3 barrels of string beans in brine, and 12 barrels dried. In addition to the above the farm yielded 100 bushels of sweet potatoes, 435 bushels of potatoes, 100 barrels of corn, 230 bushels of turnips, 100 bushels of stock beets, 67 bushels of wheat, 30 bushels of carrots, 31 bushels of parsnips, 17 bushels of onions, 5,000 head of lettuce, and 7,000 head of cabbage, the latter stored for winter use. The last time the school was visited, in the fall of 1917, an agricultural exhibit representing mostly the products of the farm was symbolical of abundance and indicative of thrift as well as good husbandry. Due to war conditions, there had been a shortage of seed beans of garden varieties. The school had responded to the need and there were bushels of bright beans of many varieties, all well cleaned and in excellent shape. The school was then planning to extend the season of practical garden work by putting in extensive hotbeds and frames for forcing vegetables.

The corn produced is fed mostly to swine on the farm, the pork being consumed at the school. The students do the killing and curing of the pork. The live stock was not of the best breeding. It seems difficult to get Negroes to appreciate and properly care for well-bred animals. At Hampton, however, there are some of the best herds, cared for in as good shape as at any school visited.

The classroom instruction as observed was very good. The students, although not timid, were especially well behaved and responsive in the presence of strangers. The teachers paid special attention to visual instruction. The making of models, so often confined to our primary instruction, was used effectively with the older students. The use of pictures and charts on the walls seemed overdone to some extent.

Community work.—The school is made an educational and agricultural center for the surrounding section and to some extent for northern Virginia. Teachers' and farmers' institutes and other organiza-

tions bring together rural leaders in the community and give opportunity to leaders from the outside to reach them. Proximity to the National Capital gives opportunity for local people to hear men and women of national importance frequently. The school exhibit and agricultural fair mentioned was the occasion of many of the local farmers getting not only stimulation from their neighbors but also from men from Government departments who were interested in their work and social problems.

Chapter IV.

FEDERAL AID FOR VOCATIONAL AGRICULTURE.

HISTORY OF THE MOVEMENT.

The Dolliver, Davis, and Page bills.—The passage of the Morrill Act and subsequent acts giving Federal aid to the agricultural colleges has been made a precedent for repeated attempts to extend Federal aid for agricultural education. The first of these attempts to aid the secondary schools was in 1910, when Senator James P. Dolliver, of Iowa, introduced a bill providing Federal grants "to cooperate with the States in encouraging instruction in agriculture, the trades and industries, and home economics in secondary schools; in preparing teachers for those vocational schools in State normal schools." About this time there was a strong movement on foot to secure Federal aid for extension departments in all of the land-grant colleges. This movement was in accordance with recommendations made in 1909 by a committee of the Association of American Agricultural Colleges and Experiment Stations. The recommendations of these committees later, in 1910, were incorporated into the Dolliver bill, and furnished a starting point for the bill passed in 1914 as the Smith-Lever Act. Representative Charles R. Davis, of Minnesota, championed the Dolliver bill in the House of Representatives, hence the bill is sometimes referred to as the Davis bill. In 1911 Senator Carroll S. Page, of Vermont, advocated Federal aid for vocational education in secondary schools along lines similar to those of the Dolliver bill. The Page bill and other efforts to aid school instruction lost out for the time being because public interest and congressional favor were centered on Federal aid for agricultural extension work for the colleges. After such aid was secured, in the passage of the Smith-Lever Act, effort was again put forth to secure Federal subsidy for vocational education in the secondary schools.

Commission on national aid to vocational education.—In January, 1914, Congress passed an act authorizing the President to appoint a commission of nine members to "consider the subject of national aid for vocational education and report their findings and recommendations not later than June 1 next." This commission consisted of the following members: Senator Hoke Smith, of Georgia; Senator Carroll S. Page, of Vermont; Representative D. M. Hughes,

of Georgia; Representative S. D. Fess, of Ohio; John A. Lapp, of Indiana; Miss Florence M. Marshall, of New York City; Miss Agnes Nestor, of Chicago; Charles A. Prosser, of Minneapolis, Minn.; and Charles H. Winslow, of Washington, D. C.

As a result of the efforts of the commission¹ bills were introduced into the Senate by Senator Hoke Smith, of Georgia, and into the House by Representative Dudley M. Hughes, of the same State, which finally passed both houses as "An act to provide for the promotion of vocational education; to provide for cooperation with the States for the promotion of such education in agriculture and the trades and industries; to provide for cooperation with the States in the preparation of teachers of vocational subjects; and to appropriate money and regulate its expenditure." This act, known as the Smith-Hughes Act, became a law when President Wilson gave it his approval in February, 1917.

THE SMITH-HUGHES ACT.

Purpose of the act.—The act which went into effect July 1, 1917, is in reality an effort on the part of the Federal Government to stimulate the States to provide a system of secondary education in agriculture, the trades and industries, and home economics and to extend the benefits of these forms of vocational education to all those over 14 years of age. By extending financial aid to the States the Federal Government is not establishing a national system of education, but it does purchase the right to participate in the control of State systems in that it sets up standards which the States must meet.

Financial aid extended.—In order to stimulate the States to expend money especially for vocational education, the act makes available certain funds from which the States are reimbursed for money expended, providing they meet the requirements of the act and reach the standards set by the Federal board of control. The following table² shows the total amounts appropriated:

¹ Report of the Commission on National Aid to Vocational Education. House of Representatives. Document No. 1004, 1014.

² From Federal Board for Vocational Education. Bulletin, 1917, No. 1. P. 62. Statement of policies.

TABLE 1. — Annual grants by the Federal Government for vocational education under the Smith-Hughes Act approved Feb. 23, 1917.

Fiscal year ending June 30.	Total.	Agriculture: For salaries of teachers, supervisors, and directors. (Sec. 2.)			Trade, home economics and industry: For salaries of teachers. (Sec. 3.) ¹			Teacher training: For salaries of teachers, and maintenance of teacher training. (Sec. 4.)			For Federal Board for Vocational Education. (Sec. 7.)
		Total.	Allotted on basis of rural population.	Additional to provide minimum allotments to States.	Total.	Allotted on basis of urban population.	Additional to provide minimum allotments to States.	Total.	Allotted on basis of total population.	Additional to provide minimum allotments to States.	
1917-18.....	\$1,890,000	\$548,000	\$500,000	\$48,000	\$566,000	\$500,000	\$66,000	\$548,000	\$500,000	\$48,000	\$200,000
1918-19.....	2,512,000	784,000	750,000	34,000	798,000	750,000	48,000	784,000	760,000	24,000	200,000
1919-20.....	3,182,000	1,024,000	1,000,000	24,000	1,014,000	1,000,000	14,000	924,000	1,000,000	24,000	200,000
1920-21.....	3,816,000	1,268,000	1,250,000	18,000	1,276,000	1,250,000	26,000	1,090,000	1,000,000	90,000	200,000
1921-22.....	4,326,000	1,514,000	1,500,000	14,000	1,528,000	1,500,000	28,000	1,090,000	1,000,000	90,000	200,000
1922-23.....	4,821,000	1,761,000	1,750,000	11,000	1,772,000	1,750,000	22,000	1,090,000	1,000,000	90,000	200,000
1923-24.....	5,318,000	2,009,000	2,000,000	9,000	2,018,000	2,000,000	18,000	1,090,000	1,000,000	90,000	200,000
1924-25.....	6,390,000	2,514,000	2,500,000	14,000	2,556,000	2,500,000	56,000	1,694,993	1,000,000	694,993	200,000
1925-26.....	7,367,000	3,027,000	3,000,000	27,000	3,050,000	3,000,000	50,000	1,690,000	1,000,000	690,000	200,000
Annually thereafter.....		3,027,000	3,000,000	27,000	3,050,000	3,000,000	50,000	1,690,000	1,000,000	690,000	200,000

¹ Not over 20 per cent for salaries of teachers of home economics.

A study of this table will bring out the fact that in addition to the \$200,000 appropriated annually for the use of the Federal board, there are three separate funds, viz: (1) For salaries of teachers, supervisors, and directors of agriculture; (2) for salaries of teachers of home economics and industry; and (3) for the salaries and maintenance of teacher training. These funds are extended to the States on a fifty-fifty basis, i. e., each dollar of Federal funds must be matched by a dollar from the State or local community.

If the States do no more than match the Federal funds, there will be available after 1926 an annual appropriation of \$14,334,000, in addition to the \$200,000 used by the Federal board. As a matter of fact many of the States are doing more than meeting the Federal appropriation. In other words, in these States the act is working as it was intended to do, in stimulating the States to liberality with regard to State aid for vocational education.

It will be noted also that the funds increase year by year until the maximum for salaries of teachers is reached in 1925-26. The maximum for teacher training is reached earlier, in 1920-21. The act provides also that unless the teacher training fund is used by June 30, 1920, the other funds will not be available. These provisions arise out of the urgent and immediate need for teachers with special training for these lines of vocational training.

The funds for teachers of agriculture are allotted to the States on the basis of the relation of the rural population of the State to the rural population of the United States, the funds for salaries of teachers of trades and industries and home economics on the basis of urban population, and the teacher training funds on the basis of total population. The population of some States is so small that the allotted portion of the total appropriation would not be worth considering, hence a special appropriation was made to bring the minimum appropriation for each of the three funds to \$5,000 for each State. For example, the portion of the \$500,000 allotted to Connecticut, in 1917-18, for salaries of teachers and supervisors of agriculture was \$1,164.33 based on rural population. To bring this allotment to \$5,000, it was necessary to appropriate \$3,835.67 from the special fund appropriated to guarantee the minimum allotment.

Federal and State administration.—The act created a Federal Board for Vocational Education consisting of the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Labor, the United States Commissioner of Education, and three citizen members appointed by the President. One of these citizen members represents manufacturing and commercial interests, and one a representative of labor. In addition to the administration of this act, the Federal board is expected to make investigations relative to

the various aspects of vocational education involved in the act. Such investigations may be carried on in cooperation with the various Federal departments.

Any State to take advantage of the Federal funds available must accept the enactment and designate or create a State board to cooperate with the Federal board in the administration of the act within the State. Provisions are made for the Government to accept the act to designate or create temporary boards of control in States where the legislatures did not meet in 1917.

State standards.—The act does not go into detail with regard to a general standard for vocational education, but leaves that for the Federal and State boards to work out for each State. Each State is expected to prepare a plan to submit to the Federal board showing the kinds of schools, equipment, courses of study, methods of instruction, qualifications of teachers and supervisors, plans for training teachers, and plan for supervision.

Although it is expected that each State will work out a plan to meet its individual needs, the act places several safeguards upon the appropriations that they may be spent for only those phases of education for which they were intended. The standards set for vocational agriculture may be summarized briefly as follows: (1) Federal money appropriated for the teaching of vocational agriculture can not be spent in the teaching of other subjects necessary to build a well-rounded course of training. (2) The Federal appropriation for the salaries of teachers, supervisors, and directors of agriculture must be spent only on salaries, equipment, and maintenance. One-half of the salaries must be provided from State and local funds. In the case of training and local funds for teachers, however, Federal money may be spent for one-half of the maintenance of such training. (3) Vocational agriculture must be under State supervision and control. (4) It must be of less than college grade and be designed to meet the needs of persons over 14 years of age who have entered or who are preparing to enter upon the work of the farm or of the farm home. In order that the instruction may be practical the act stipulates that the schools shall provide for directed or supervised practice in agriculture, either on a farm provided for by the school or other farm, for at least six months per year. (5) Although the act leaves to the State boards the minimum qualifications of teachers to be approved by the Federal board, it stipulates that in the training of teachers and supervisors such training shall be given only to those persons who have had adequate vocational experience or contact in the line of work for which they are preparing themselves as teachers, supervisors, or directors, or who are acquiring such experience or contact as a part of their training.

OPERATION OF THE SMITH-HUGHES ACT.

The Federal Board for Vocational Education.—Soon after July 1, 1917, when the act went into effect, the President appointed the three citizen members of the Federal Board for Vocational Educational. The board was organized as follows: David F. Houston, Secretary of Agriculture, chairman; William C. Redfield, Secretary of Commerce; William B. Wilson, Secretary of Labor; P. P. Claxton, Commissioner of Education; James P. Munroe, of Massachusetts, representing manufactures and commerce; Charles A. Greathouse, of Indiana, representing agriculture; and Arthur E. Holder, of Iowa, representing labor.

The board elected Charles A. Prosser, then president of Dunwoody Institute, as director. Mr. Prosser selected the following as assistant directors to form the executive staff: Layton S. Hawkins, agricultural education; Lewis H. Carris, industrial education; F. G. Nichols, commercial education; Josephine T. Berry, home economics education; and Charles H. Winslow, research. The entire country was divided into five geographical regions, with an agent for each branch of vocational education in charge.

As the vocational education act is couched in terms rather general, it became necessary at the outset for the Federal board to secure legal interpretations and to issue statements of policy regarding the administration of the act. As a rule the board has been broad in its interpretation of the act, but it has at all times made it clear that Federal money could be used only for bona fide training for useful employment in the vocations for which the act provided. In the case of agriculture, for example, the board will not sanction the use of Smith-Hughes funds for the ordinary form of academic agriculture usually taught in the high school. The work of the school must be intimately related to the supervised practice given on the farm which the act requires.

Considerable time during the first year has been spent in going over the plans submitted by the various States. The board has not attempted to standardize the kind of instruction to be given in the Nation at large, but has left each State to work out a plan which would seem best fitted to its local needs.

The board has not done as much investigational work in the field of agricultural education as it would most likely have done in normal times. No sooner was the board organized than it was called upon to aid in the emergency training of war workers along certain technical lines. Recently (June 10, 1918) Congress passed the bill known as the Smith-Sears Act which delegates to the Federal board the duty of reeducating disabled soldiers in some useful employment. This work of vocational rehabilitation includes agricultural

training. It promises to be a work of enormous magnitude and one which may affect materially future plans for vocational training. It seems reasonable that the machinery established for the training of the cripples of war will be continued in operation for the benefit of the cripples of industry, if not for general vocational training.

Although most of the publications of the board for the first year deal with emergency war training, a general bulletin was published giving a statement of policies and one dealing with the organization and administration of agricultural education. In May, 1918, the board began the publication of the Vocational Summary, a monthly paper dealing with its various lines of work.

Without doubt the war handicapped the establishment of schools and departments of vocational agriculture. Not only was it difficult to secure teachers with proper training, but many of the older students who would have desired vocational training under normal conditions, either joined the Army directly or entered the Students' Army Training Corps. The following table¹ shows the results obtained up to the present time:

TABLE 2.—Statistics of Federal-aided agricultural schools for year ending June 30, 1918.

AGRICULTURAL SCHOOLS AND DEPARTMENTS.

	United States total.	Region.				
		North Atlantic.	Southern.	East Central.	West Central.	Pacific.
Schools.....	1,741	794	285	423	45	39
Pupils.....	15,187	3,649	4,648	4,681	921	1,288
Teachers.....	893	305	240	220	62	68

TEACHER TRAINING DEPARTMENTS.

Centers.....	40	8	9	11	7	5
Pupils.....	1,534	155	193	1,010	79	97
Teachers.....	116	18	24	30	19	25

¹ Adapted from the Second Annual Report of the Federal Board for Vocational Education, 1918.

Chapter V.

TRAINING TEACHERS OF AGRICULTURE.

DEVELOPMENT OF AGRICULTURAL TEACHING.

General versus special meaning.—The term agricultural education has, in times past, and in the minds of many people to-day, a very broad application. It has been linked closely with the general development of agriculture, including the work of agricultural societies, fairs, the entire field of the agricultural colleges, the experiment stations and departments of agriculture, and the work done through the rural press and agricultural publications. To-day the tendency is to consider agricultural education a phase of education linked with school instruction, and related training. In other words, the tendency is to limit the meaning with all the limitations of the term education applied in a technical sense, and to further restrict it to organized training in agriculture. In the future it ought not to be so difficult for a worker in agricultural education to establish himself as a specialist in education rather than an agriculturist.

Demand for trained teachers.—The greatest drawback to placing agricultural training upon a better basis and to extend its usefulness in all grades of schools has been the lack of teachers trained specifically to teach agriculture and related branches. Most of the failures have resulted from a lack of preparation on the part of teachers or the failure to secure proper supervision or direction of the work because no one could be obtained to take hold of this work in the right way. Too often school officials have yielded to a popular demand for agriculture in the schools only to fail because the teachers who attempted the work were not properly trained. In recent years many have felt that the greater part of the responsibility for success rested upon the teacher, and more attention has been given to securing teachers with special training. Educational authorities have begun to realize that the place to begin effective agricultural education is in institutions for training teachers. So far it has not been possible to get young people to train for work not in operation, hence it has been impossible to establish teacher-training departments before the work was established in the schools. The two lines are developing together, but until teacher-training departments turn out a finished product the schools are in a sense putting up with makeshifts.

Attempts to meet the demand.—Where special teachers have been employed attempts have been made, as a rule, to secure graduates of agricultural colleges. Although these men may have had practical as well as technical training in agriculture in the past, as a rule they have not had training as teachers. In very few cases have they had special training in teaching agriculture. For the most part they teach largely as they have been taught. The college training in agriculture may have been good or bad for college students, but neither the subject matter nor the method, at its best, was suited to students in secondary schools. In a large number of schools visited, the author has seen the same subject matter which the teacher had in his college course given out to high-school students in much the same way that the teacher received it in college. The lecture method has been abused to a great extent. While textbooks have been used more extensively in recent years, too often they have been books not organized as textbooks at all, or books not written for secondary schools.

General agriculture has been taught mostly by teachers who have had little or no training in agriculture; often by teachers of biology or other sciences. Where these teachers have had special aptitude and training as teachers some very good work has been done, but too often they have been like the teachers of agriculture without special training in pedagogy. Where they have applied the laboratory method it has been for the most part with the technical aims, methods, and materials of the college. However effective it might have been for training scientists, it has not gone far in the training of farmers nor in aiding boys and girls to adjust themselves to rural conditions.

As a reaction against the lack of practical training given by such teachers in general courses, there has arisen a demand for agriculture to be placed upon a basis strictly vocational. In securing teachers for vocational agriculture some of the States have demanded that applicants must be first of all practical farmers. In many cases they have taken men who have had little technical training in agriculture and no special training as teachers. They have appreciated the need of such training, however, and have in some cases made provisions for the teachers to make up their lack of training in both lines while in service.

Development of departments of agricultural education.—Departments of agricultural education in connection with our agricultural colleges and universities have been the product of a gradual growth. In fact, there has been, up to the present time, a great range of variation in their organization and the work they have been attempting to do. In some cases they have been an outgrowth of

schools or departments of education, giving more attention to the rural schools and the problems of teaching agriculture and other subjects. In other cases schools and colleges of agriculture have gradually given more attention to the problems of the elementary and high schools and the preparation of teachers in such subjects as agriculture and nature-study. Most of the agriculture taught in the secondary as well as the elementary schools in the past has been of a general and elementary nature. Some of the States have required such agricultural instruction in rural schools, and some have required certain training in agriculture on the part of teachers. The colleges and normal schools, in the past, have established courses for teachers in summer sessions and correspondence courses to meet this demand. For the most part these courses have involved subject matter rather than method. Some institutions have followed up this work by furnishing materials and suggestions upon teaching to teachers in service. The New York State College of Agriculture at Cornell University has done a notable work along this line. For nearly 10 years it has been sending out its Rural School Leaflets, and in other ways aiding elementary teachers, before courses were developed for training teachers for the secondary schools. Until very recently, in the discussions of agricultural teacher-training little attempt has been made to distinguish between elementary and secondary work. Special college courses for training teachers of agriculture were simply suggested as possibilities.*

With regular four-year courses established through the stimulus of State aid, a demand arose for teachers especially trained for the secondary schools. Some of the Southern States, however, which were first to inaugurate secondary agricultural schools, have been the last to establish departments of agricultural education and to develop courses especially for teachers. Departments of agricultural education were established and the work first placed upon a professional basis in the following institutions: University of Minnesota, Michigan Agricultural College, Massachusetts Agricultural College, and the University of California.

Agricultural education upon a professional basis.—The training required for the successful teaching of agriculture in secondary schools is such that it may be considered professional. The training given especially to develop teaching ability should be considered a phase of professional education, whether imparted in a school or department of education or in a school or department of agriculture.

* See Crosby, D. J., Training Courses for Teachers of Agriculture. U. S. Department of Agriculture. Yearbook, 1907. Jackson, E. R., Agricultural Training Courses for Employed Teachers. U. S. Department of Agriculture. Bulletin, 1913, No. 7.

A WORK FOR COLLEGES.

As a rule teachers of agriculture are required to have college training for teaching agriculture in the secondary schools. Departments of agricultural education are confining their efforts more and more to training teachers of the secondary schools, leaving the training in agriculture for elementary schools largely to the normal schools and high-school teacher training classes. Departments of agricultural education are also offering courses for general leadership in rural life and are aiding in the training of the following groups: Superintendents and supervisors of rural schools, boys' and girls' club leaders, county agents and other extension workers, supervisors and directors of vocational agriculture, and secretaries for rural community centers. A beginning is being made also in the special training of college teachers of agriculture. Few agricultural colleges have reached the stage where they are ready to act upon the realization that college instructors need special training as teachers. Very recently, however, the committee on instruction in agriculture of the American Association of Agricultural Colleges and Experiment Stations¹ has strongly recommended the improvement of methods, ending its report with the recommendation "that immediate and serious attention be given for means of improving the quality of teaching in the college course in agriculture, and as one of the means to that end it would urge the development of strong departments of agricultural education."

Factors involved.—(a) Agricultural training. A teacher of agriculture should have a broad general training in agriculture involving (1) scientific or technical training based on the natural sciences and their direct application to agriculture; (2) practical training and farm experience. As a result of the criticism that the training of the agricultural colleges is not sufficiently practical, more attention has recently been given to the requirements in practical agriculture both as a prerequisite to college courses in agriculture and as a part of such courses.² (b) Professional training. Training in education should involve: (1) A general foundation in educational psychology, and the general principles and methods of education with particular application to the adolescent; (2) special training in teaching agriculture in the secondary school; (3) opportunity for practice teaching and practical experience in leading young people and working with farmers. (c) Correlated general training. Inasmuch as the teacher of agriculture is expected to be a leader in rural life, his

¹ See 20th report of this committee. In 31st Annual Report of the Association, 1917.

² See 16th and 17th reports of the committee on instruction in agriculture of the American Association of Agricultural Colleges and Experiment Stations in the 27th and 28th Reports of the Proceedings of the Association, 1913, 1914.

training should include: (1) Such subjects closely allied to agriculture as rural sociology and rural economics; (2) such practical training for expression as public speaking and agricultural journalism; and (3) such general training for citizenship, cultural, and avocational pursuits as time will permit.

Limitations of a four-year course.—It is obvious that if we demand scientific and practical training in both agriculture and education, in addition to a broad training for leadership, we can not accomplish this in a four-year college course. A great deal will depend upon the previous training of the student. Students entering the agricultural courses may be grouped into three classes as follows: (1) Those who have been reared on a farm and have had an agricultural course in a secondary school; (2) those who have been reared on a farm and who have not had an agricultural course in secondary schools; (3) those reared in the city who have had neither instruction nor practice in agriculture. Students from the first group should furnish by far the best material for teacher-training courses and may secure the requisite technical and professional training in a four-year college course. The training of the other groups should be supplemented with additional instruction and practical experience. As a matter of fact many students do not fit entirely into any of these groups and as yet little attempt is made to classify them according to their previous training and experience. The average agricultural college student needs the full four years for agricultural and general training, leaving his professional training to be secured in addition to that. At the present time school boards in most States consider themselves fortunate to get a college graduate who has had an agricultural course and an aptitude for teaching to take the secondary work in agriculture. Even in States which require training in education for certification, this requirement is often waived for the teacher of agriculture. Special certificates are given to those who have not been trained as teachers. As a rule, however, strong departments of agricultural education have been developed only in those States which require training in agricultural education of their teachers of agriculture.

The present shortage of teachers and the tendency to take teachers without special training has made it necessary for departments of agricultural education to turn their attention to training teachers in service. In many cases those now teaching agriculture and related sciences furnish good material for an early supply of trained teachers.

Training in service is given in a number of ways, chief among which are the following: Summer sessions and winter short courses, correspondence courses, conferences, institutes and extension courses, and itinerant teacher training. Some of these methods may naturally

overlap and may be used purposely in combination. The placing of agriculture upon a vocational basis, through the stimulus of Federal aid, has called for many teachers not familiar with vocational methods. These men have been placed in service and organized methods used to improve their training as well as their teaching in connection with the supervision of their work. In some cases the itinerant teacher training is done directly by the State supervisor, in other cases by the department of agricultural education of the teacher training institution. In still other cases the training is given through cooperation of the supervisory forces and the teacher training institution.

LAND-GRANT COLLEGES AND THE PREPARATION OF TEACHERS OF AGRICULTURE.

Extent and nature of the work given.—A study of the teacher-training curricula of the State agricultural colleges¹ made by the Bureau of Education, in 1917, showed that while nearly all of the 48 institutions claimed to offer four-year curricula for training teachers of agriculture only 40 of them had work worthy of inclusion in such training. The Bureau of Education does not regard the work bona fide unless the curriculum includes at least a two-hour course in special methods of teaching agriculture and at least one three-hour course in either psychology or education.

The work given varies from a special four-year curriculum in agricultural education to a regular agricultural curriculum with courses in education taken as electives or an educational curriculum with courses in agriculture taken as electives. The requirements for graduation vary from a total of 120 semester hours to a total of 216 semester hours. The hours required in agriculture vary from none to 77 and in education from 10 to 26. Many of the curricula leave no time for electives, while Cornell University, which requires no courses in agriculture, leaves 45 per cent of the student's time free for elective subjects. The history of education occurs oftener in the educational courses than any other course. Only 29 institutions offered facilities for practice teaching, and many of these were makeshifts when judged by high standards. Only 34 institutions supplied information concerning the number of students registered in agricultural education. Of the total of 859 students, 18 were women. Of the 513 students reported as graduating with professional training in agricultural education, 299 were known to be engaged in teaching or supervising agriculture in the school.

Stimulus of Federal aid.—The Nelson amendment to the agricultural appropriation bill, which was passed in 1907, increased the

¹Jarvis, C. D. Vocational Teachers for Secondary Schools. Bureau of Education. Bulletin 1917, No. 38.

Federal appropriation for the land-grant colleges and provided that "said colleges may use a portion of this money for providing courses for the special preparation of instructors for teaching the elements of agriculture and the mechanic arts." Some of the institutions have used these funds in establishing departments of agricultural education, others have used them in a general way in their work of aiding teachers of elementary agriculture, while a large number have done nothing until very recently in the way of agricultural education. Many of the agricultural men have taken the attitude that if the prospective teacher knew his subject he could teach it and that no professional training is needed. In institutions having schools or departments of education, agricultural students who expected to teach have been encouraged or required to take general courses in education, especially in States where such training was required for certification. The student in such cases was expected to make his own application of education to agriculture.

Placing agriculture upon a vocational basis in the secondary schools is doing a great deal to strengthen the demand for special courses in agricultural education. The Smith-Hughes Act not only raises the standard for teachers so that special training is required but also provides funds for that training. By 1921 there will be \$1,000,000 of Federal funds available for teacher training, 60 per cent of which may be used for training teachers of agriculture, this sum to be duplicated from State funds. Since the Federal act was passed most of the States have either organized separate departments of agricultural education or have extended those already organized. In nearly every case some kinds of courses in special methods of teaching agriculture have been established. There has been considerable difficulty in securing men capable of handling such courses. To do justice to the work given, those in charge should have not only technical and practical training in both agriculture and education but also have practical experience in farming and in the supervision and teaching of agriculture in secondary schools. Some of the men giving teacher training work are agricultural men who have worked into educational lines since graduation, while others are men of training and experience in general education who have taken up agriculture in recent years. As the line of work which they are directing is new, it is not to be expected that the older men have special training for it.

Typical departments of agricultural education.—Every department of agricultural education is organized along lines somewhat different and has different conditions to meet within the institution; most of them, however, may be grouped into one of the following classes: (1) Departments in universities having schools or departments of education; (2) departments in independent agricultural

colleges which do not train teachers for general subjects. The departments described at this time are fairly typical of these classes.

DIVISION OF AGRICULTURAL EDUCATION: UNIVERSITY OF CALIFORNIA.

Organization and scope.—Agricultural education in the University of California is organized as a division in the college of agriculture. Because of the fact that the university maintains a college of letters and science in which general subjects are taught, and a school of education which gives professional training, the division of agricultural education gives only special training in the teaching of agriculture and closely related general science, nature-study, and rural education. Inasmuch as the division also has charge of correspondence courses in agriculture with related extension courses, a comparatively large staff is maintained, although the teacher training has been conducted mostly by two men. Recently the university has entered into cooperation with the State Board for Vocational Education to train teachers at the University Farm School at Davis and at other points in the State and to conduct itinerant teacher training among teachers in service.

Facilities for teaching.—In times past the division gave more attention to training for elementary work with school gardens, nature study, and boys' and girls' club work. School gardens are still maintained in Berkeley at the university and used in elementary teacher training, especially during the summer session. Prospective teachers of agriculture in the secondary schools up to the present time have been taken to the university farm at Davis, where a six-weeks' course in farm practice has been given in various farm operations that all teachers may become familiar with ordinary farm practice. High schools in the State are selected for a five-weeks' course in practice teaching.

Courses of study.—Students who desire to secure a recommendation from the division as teachers of agriculture in high schools of the State are expected to take a four-year course in agriculture, with agricultural education as a major. The work of the first two years is the same as for other students in agriculture. Although the work of the junior and senior years is largely elective, the student is expected to have completed, in addition to three stipulated courses in agricultural education, at least one course in each of the following agricultural divisions: Agronomy, pomology, plant pathology, entomology, farm management, animal husbandry, dairy industry, poultry husbandry, and veterinary science.

In addition to opportunity for special studies and individual work in agricultural education, the following courses were given in 1917-18.

(a) Agencies for rural progress: Country life problems, agencies for rural progress, and the best means of utilizing these agencies for the improvement of rural communities. Lectures, assigned readings, and reports.

(b) Elements of agriculture, nature study, and school gardens: Aims, material, and methods used in agricultural instruction in the elementary and grade schools; teaching plans; educational value of the school garden; the home garden and the value of the school garden; the home garden and the value of home project work in agricultural education. Practical garden work on the campus.

(c) High school farms, gardens and community work: Lectures, reports, and conferences on the utilization of land in connection with agricultural teaching; means by which the facilities of a school can be brought into intimate and helpful relation with the agricultural interests and home life of the community supporting the school; practice in planning and executing school farm problems and demonstrations.

(d) General science and first-year agriculture: The aims and values of a general science course in the high school; comparative study of typical courses and exposition of the peculiar adaptations to the general science work of an elementary agricultural course in which plant study forms the basis of continuity; the equipment, nature, and amount of practical work needed in the course, including field trips and excursions. Outdoor and laboratory exercises are considered in detail.

(e) Agriculture in secondary schools: Agricultural teaching, including its history; the teaching methods to be employed, and the equipment needed. A general consideration of the educational aims and values of the work and the organization of the course is followed by a detailed study of materials and methods involved in the teaching of elementary agriculture, dairying, animal husbandry, horticulture, etc. Lectures, readings, and assigned practicums.

(f) Rural school administration: Readings and classroom discussions of the fundamentals of rural school organization, management, and improvement.

(g) The practice of teaching agriculture: A five-weeks' practice course in selected high schools of the State. Making of lesson plans, practice teaching reports and conferences with supervising teacher and instructor. Supervised practice teaching; the observation of methods; and management of class and laboratory instruction by the local teacher. By arrangement with the department of education properly prepared students may satisfy the requirements in practice teaching for the teachers' recommendation by taking this course instead of Education 201 (The practice of teaching).

As a rule several of the above courses are given in the summer session. No work was given for elementary teachers during the summer of 1918. Usually large classes of public-school teachers register for this work.

Students.—In 1916-17 there were 37 men and 5 women registered, with a major in agricultural education. In 1916 there were 20 graduates in agricultural education, 13 of whom secured positions to teach or supervise agriculture.

• DEPARTMENT OF RURAL EDUCATION: CORNELL UNIVERSITY.

Organization and scope.—For a number of years the New York State College of Agriculture has been doing a great deal to aid teachers in service with their problems of elementary agriculture and nature study. This work is now continued by the department of rural education, organized in 1914, although the main function of this department is to train teachers of agriculture for the secondary schools. Although the university maintains a school of education, the department of rural education in the college of agriculture is mostly independent, giving its general methods courses within the department. In addition to a force of workers who take care of the extension work in the State, three men are employed for the training of teachers of agriculture in secondary schools, one for general methods and two for special methods in agricultural education.

Agricultural education is offered as an option to agricultural students in the junior and senior years. In common with other agricultural students, considerable latitude is allowed for election of subjects to students preparing to teach agriculture. For graduation there is required, however, approximately the following: Cultural subjects, 14 hours; science, 38 hours; psychology and education, 14 hours; elective, 54 hours; making a total of 120 hours. The electives are selected with the advice of the department.

Facilities for teaching.—For practice teaching, seniors are placed as apprentices to some of the best teachers in the high schools of the State for half a year. Near-by schools and departments are used for practice by the classes in agricultural education. For example, at a time when the author visited a vocational department at Interlaken a class in agricultural education from the college at Ithaca had just been there to study the planning and equipment of the building used for vocational agriculture. One of the students of the college came to the school regularly to give the high-school students instruction in forge work.

The department is well equipped for practice in collecting, making, and using teaching materials, especially along the lines of visual instruction.

Courses of study.—The following courses were offered in the third term, beginning June 3 and ending September 28, 1918:

(a) Principles of teaching and practice—topics considered: The application of principles of educational psychology and the philosophy of education to the problem of school practice; the nature of study and its principal factors; the teacher's relation to the learning process, motivation, psychological versus logical thinking, interest and attention, motor control; the problem and the project as basis for the organization of materials; the use of first-hand sensory materials; the selection and arrangement of subject matter; teaching methods, lecture, textbook, development, recitation; assignment of lessons, questioning, practice; and classroom management.

(b) Agriculture in the high school: A study of the purposes of vocational agriculture, organization and presentation of subject matter, textbooks, and home project and extension activities of the high school. A one-day excursion is a part of the course.

(c) Principles of method: A detailed study of the principles underlying method with special reference to the teaching of vocational agriculture and home economics. Topics considered: The aims of education; education as essentially a dynamic process, illustrated in growth changes, hereditary expression, habit formation, play and manual activities, and in the expenditure of energy; the laws of learning, particularly those related to the organization of ideas; the function and structure of subject matter; the principles underlying various school practices, for instance, the project; interest in relation to learning; the basis for the organization of knowledge; the tests of teaching methods; how we think.

(d) Administration and supervision of agricultural education: This course treats: Administrative phases of agricultural education of secondary and college grade; Federal acts relating to agricultural education; comparative study of types of schools of agriculture; State systems of supervision. Visits to schools in New York and adjacent States is a required part of the course.

During the summer school, which extended from July 8 to August 16, 1918, the following additional courses were offered:

(a) Agriculture in the high school: A course for consideration of curricula, courses of study, school plot, home project, extension work, and the preparation of material as they relate to secondary school conditions. The work will be planned for those who have had technical preparation in agriculture. Lectures may be taken without laboratory work by special permission.

(b) Organization of college departments of agricultural education: This course is designed for those preparing for teaching training work in college departments of agricultural education. It deals with the study of agricultural college and high school curricula in

agriculture with respect to the technical preparation of teachers of secondary agriculture, and the professional needs of the high school teacher of agriculture, practice teaching, graduate needs to be met by such departments, and the content of special methods course in agricultural education.

(c) Administration and supervision of vocational agriculture: This course is designed especially to meet the needs of State directors of agricultural education. The Smith-Hughes Act is used as a basis for the work. Topics receiving consideration are: Types of schools, plans for supervision, preparation of teachers, supervision of home-project work, curricula, and courses of study. Visitation of schools is a required part of the course. In addition to the instruction by members of the department, lectures will be given by several State directors. L. S. Hawkins, assistant director of the Federal Board for Vocational Education, will give the lectures for one week.

(d) The social and vocational aspects of education: A course designed to give students certain fundamental points of view in the interpretation of educational problems. Emphasis will be placed upon the changing social and vocational demands made upon the school and the initiative the school should take to better social and vocational conditions. The purpose is to acquire a workable point of view for social progress and to study its applications with special reference to education in a democracy.

Emergency courses in agriculture.—Due to the lack of trained teachers to take hold of vocational departments of agriculture during the war period the New York State College of Agriculture, at the request of the State department of education, offered emergency courses for the preparation of these teachers for a period of nine weeks, beginning July 29, 1918. These courses under the direction of the department of rural education, covered the following subjects: Farm shop, soils and fertilizers, dairy industry, poultry husbandry, animal husbandry, general fruit growing, agriculture in the high schools, farm management, and farm crops. Each of these subjects was taken up from the point of view and with regard to the needs of teachers of agriculture in the high school.

From August 5 to August 10 a conference of all agricultural instructors in the New York schools of agriculture, mechanic arts, and home making was held at the college.

Students.—During the school year 1916-17, 43 men and 4 women were registered in the regular college course in agricultural education. In 1916, 82 of the agricultural students who graduated had taken special training courses; 35 of these students secured positions as teachers.

DEPARTMENT OF AGRICULTURAL EDUCATION: AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS.

Organization and scope.—As all teacher training in the college is under the direction of this department, it includes general training in education as well as special work in agricultural education. The chief efforts of the department are centered upon training teachers of vocational agriculture for the secondary schools of the State and in aiding those teachers in service. The latter work consists chiefly of visiting the schools and furnishing direct aid thereby, in conducting extension classes where teachers may be brought together for regular courses, and in furnishing illustrative material in the way of charts, slides, and exhibits.

Teaching facilities.—The department occupies three rooms in a new modern building. One room is a model laboratory in which are exhibited and demonstrated desirable forms of equipment for teaching the various courses in the high school. Laboratory materials are also on display with suggestions as to their preparation and use. Another room is equipped as a laboratory for the preparation of illustrative materials. Various charts and mimeographed materials are prepared, lantern slides made and colored, and various photographs and other pictures prepared for use in visual instruction. The department library contains the newest books and bulletins on agriculture suited to secondary schools as well as works on education.

In addition to three regular members of the staff, a professor of agricultural education and two associate professors of agricultural education, two student assistants are employed in the department.

Courses of study.—Two four-year college curricula are offered: One leading to the degree B. S. in agricultural education, and the other to a B. S. in agriculture. The two curricula are nearly alike in the first two years and may differ but little in the two upper years, the difference depending upon the courses the student may elect. Six hours of electives are left open in each semester of the junior and senior year of the first named curriculum, while half of the optional credits must be in either agriculture or agricultural education in the agricultural curriculum.

The department offers the usual courses in the following subjects: Educational psychology, methods and teaching, schools administration, high school problems, and vocational education. The special courses in agricultural education are described in the catalogue as follows:

Administration of high-school agriculture: This course is a study of the specific problems that confront the teacher in carrying on the work of the department of agriculture in the high school. Among the topics discussed are:

The selection of subject matter suited to local conditions; agriculture in the curriculum; laboratory, field, and home exercises; visual instruction; supervision of home projects; laboratory and library equipment; use and management of school farm, and community or extension work. The laboratory period will be used for the preparation of teaching material, and for working out individual assignments connected with the work. Text: *Materials and Methods in High School Agriculture*, by Hummel.

Rural education: The primary purpose of this course is to make a study of rural education in its broad sense, with a view of preparing teachers and extension workers for more efficient service in rural communities. Some of the topics discussed are: Changes in rural education and the rural home, together with the factors effecting such changes; the school as a community center; other agencies to be coordinated; community play and recreation, and the redirected rural school. Text: *Rural Life and Education*, by Cubberly.

Agricultural extension and demonstration: This course is intended to give a survey of the whole field of extension in agriculture and home economics and to give practice that will prepare for actual field work. Among the topics discussed are: Evolution of extension in agriculture and home economics, general organization for extension, methods of extension, farm demonstration work, junior agricultural clubs, extension by experts, extension by railroads and commercial companies, and the training of extension workers.

Teaching: The purpose of this course is to give opportunity for students to get actual experience in teaching secondary agriculture under supervision. Lesson plans must be submitted by the student and approved by the critic teacher in advance of the lesson. The teaching methods and results of the student will be discussed in special conferences. Provision will be made for classes on the campus and near-by high schools. Application for this course must be made at least three months in advance.

To other courses—agricultural instruction and agricultural extension and demonstration—are modifications of courses described in the latter course. The student is expected to do some extension work as a part of the course.

In addition to other work offered in the summer session, a rural life school is conducted for six weeks. Courses which do not involve college credit are given in agriculture, rural education, rural sociology, and rural economics. These courses include modified forms of regular college courses intended for the training of high-school teachers of agriculture. A rural life conference, including a rural pastor's conference and a rural school conference, is held for one week.

During the summer of 1918, from June 3 to July 13, special courses were offered for teachers of vocational agriculture. These courses, which were arranged in conference with those in charge of the Smith-Hughes work in the State, included: Administration of high school agriculture; elementary crop production; and market types of horses and swine.

Students.—In 1916-17 120 men enrolled for agricultural education. In 1916 there were 32 graduates, 10 of whom secured positions as teachers of agriculture.

DEPARTMENT OF AGRICULTURAL EDUCATION: OREGON STATE AGRICULTURAL COLLEGE.

Organization and scope.—The department of agricultural education is a part of the school of vocational education, which embraces also departments of education, psychology, home economics education, industrial education, and commercial education. The college is expected to confine its teacher training largely to preparing teachers of vocational subjects in the secondary schools. General training in education and psychology is given, however, as a basis for the training of teachers of special vocational subjects. The function of the department of agricultural education is "to train men and women as teachers of agriculture in the colleges and secondary schools; to train extension workers in agriculture; and to develop leadership in rural life and education."

Teaching facilities.—Although teachers of agriculture have had some special training for a number of years as a part of the work of the department of industrial education, the department of agricultural education has been but recently organized and is not fully equipped. The idea in equipment is not to have elaborate equipment but to train teachers with such equipment and facilities as will be within their reach in secondary schools. A combination laboratory and classroom is being equipped with such illustrative and reference material and laboratory apparatus as should be used in a department of vocational agriculture in a high school.

The department of agriculture in the local high school is in charge of an instructor in agricultural education of the college. This department is used for practice teaching with the instructor acting as critic teacher.

Courses of study.—Students preparing to teach agriculture in the secondary schools register in the school of agriculture, taking the prescribed work for all agricultural students in the first two years. In the last two years instead of specializing in some branch of agriculture the work is largely prescribed to round out a more general training in agriculture and related science and to include 15 hours of professional training. This latter training includes educational psychology, principles of education, vocational education, secondary education in agriculture, and practice teaching.

Facilities are afforded for special students in agricultural education to graduates of normal and agricultural courses. In addition to seminars for these students and practice teaching classes, the following courses are offered:

(a) Secondary education in agriculture: The principles of education as applied to the teaching of vocational agriculture in secondary schools. Aims, methods, and materials adapted to the practical training of students over 14 years of age are considered; including the

organization of courses, the collection and use of illustrative and reference materials, and the various phases of classroom and laboratory instruction.

(b) Seminar agricultural education: A discussion of special problems in the teaching of agriculture and in the administration of agricultural education which will be brought out in an effort to keep in touch with the progress of this phase of education. The seminar includes also a critical review of the current literature of the subject.

(c) Educational resources of the rural community: The special aim of this course is to prepare teachers for broader social service. The rural school, the farmhouse, the country church, farmers' organizations, and other agencies for rural progress will be considered with a view of working toward a better correlation and a greater cooperation in effort for rural development. Special attention will be given the rural school as a community center.

(d) Extension methods in agriculture: The history, organization, and methods of county agricultural agent work; lectures, assigned readings and practice in news writing, outlining program of work, drawing projects, chart making, conducting meetings, etc.

(e) Agriculture and general science for teachers: The aims, materials, and methods in general agriculture and general science with organization of courses for secondary schools. Special attention to supervision of productive projects to meet emergency needs.

(f) Elementary education in agriculture: The aims, materials, and methods of prevocational and educational agriculture in the elementary schools, the relation to nature study and the boys' and girls' club work. Special attention given to school and home gardens and such projects as poultry and rabbits.

The last-named course is given in the summer session and to teachers and supervisors in the elementary schools at Portland. Courses for the training of vocational teachers are also offered at Portland. Secondary education in agriculture is given as an extension course in the itinerant training of teachers of agriculture in service by the head of the department who serves also as supervisor of agricultural education in the State.

Students.—In 1916-17, 14 men were registered in the department of industrial education. In 1916 there were 12 graduates, all of whom secured positions as teachers.

PRACTICAL PHASES OF TRAINING.

The demand to place agricultural instruction upon a more practical basis and the standardization of vocational agriculture through Federal and State control are calling for the more practical train-

ing of teachers. The practical training as now given may be classified as follows: (1) Practice in agriculture; (2) practice in teaching; and (3) practice in the preparation and use of teaching materials.

Practice in agriculture.—In most of the colleges the problem of making the agricultural training practical is considered a problem for the various agricultural departments. Departments of agricultural education take the men with the training as they have received it in the various phases of agriculture. In some cases, however, as this training is not sufficiently practical to enable the prospective teachers to direct vocational work, the departments of agricultural education have been obliged to secure new courses of a practical nature or to bring about a reorganization of courses as given. Although most of the States have required two years of farm experience for teachers of vocational agriculture, it is found necessary to supplement this and round it out in the training course to meet their needs as teachers. Some States are using teacher training funds to give practical shopwork to prospective teachers. Other States find it essential to have prospective teachers, directors, and supervisors of productive farm projects carry out such projects themselves in much the same manner as they will expect of their students. Conducting practical farm projects on the college farm has been a feature of several of the emergency teacher training courses. It is possible that it may become a permanent feature of regular courses for teachers of vocational agriculture. It seems reasonable that the prospective teacher should secure some of his practical training in agriculture in the light of a need which differs from the specialist or scientist or even from the student who returns to the farm.

Practice in teaching.—Securing suitable practice in teaching is admitted to be one of the most difficult and expensive of all forms of teacher training. It is presenting many new difficulties to departments that train teachers of vocational agriculture. Some of the agricultural colleges offer vocational courses of secondary grade and in some cases students in agricultural education secure practice in teaching the students in such courses. The chief objection to such practice is that it is secured under conditions widely variant from the ordinary secondary school. The students are older as a rule and the methods used in teaching them are too often the same methods used in teaching regular college students. As a rule the equipment is the same as used for college students. It is often difficult to secure cooperation wherein such practice may be supervised by those trained in education instead of by those trained in some special phase of agriculture. In some cases the students do not even get this kind of practice. If they secure any practice at all it is in the nature of moot classes of their fellow students.

Some of the colleges depend upon local high schools to secure practice for their students. Under some conditions this plan works well. Where one school is used for a large number of students, abnormal conditions arise and the plan does not work well.

One of the best plans yet observed is the placing of prospective teachers in agricultural departments of rural high school as apprentice teachers for a period of several months. As the local teacher acts as critic teacher, the plan is limited by the number of schools available in which teachers are in charge who are qualified to direct the work of a teacher in training. It is necessary to give the work careful general supervision, which means close cooperation between those in charge of teacher training and those in charge of the agricultural instruction in the schools. As the student may be called upon to give up all other tasks for a whole semester, the work must involve sufficient credit or monetary compensation to induce students to take it. In New York some compensation is given such teachers in training. It will be seen that the expense of such a plan puts limitations upon it. In the future, perhaps, it will be desirable to put limitations on teacher training and at the same time to make the work more thorough. This plan promises much for the future.

Practice in the preparation and use of teaching materials.—Many of the special courses in agricultural education call for laboratory work as well as practice teaching. It has been interesting to note that some of the older men in charge of the work who went into agricultural education from other lines of teaching have not known what to do with laboratory periods, while many of the men who have had actual contact with the problems of making the work practical in secondary schools have not had sufficient time for all of the practical training they desire to give their students. Although the extent and nature of the work done depends much upon the equipment and organization, as well as the aims of the various departments, most of the instruction will fit into the following groups:

I. Preparing illustrative and laboratory material.

1. Use of a camera.
2. Use of a stereopticon.
3. Making lantern slides.
4. Collecting and mounting pictures.
5. Chart making.
6. Collecting and mounting insects and other small animals.
7. Collecting and mounting plants.
8. Preparing exhibits and collecting laboratory materials.

II. Use of reference material.

1. Making collections of bulletins, etc.
2. Classifying and cataloging reference material.
3. Making, mounting, and indexing clippings.

III. Organization of subject matter.

1. Working out curricula and courses of study.
2. Preparation of lesson outlines and study outlines for projects.
3. Preparing forms for records.
4. Planning practicums and field trips.
5. Preparation of survey outlines.

IV. Planning and making equipment.

1. Drawing plans of classroom, laboratory, shops, etc.
2. Planning equipment for classroom and laboratory.
3. Making simple equipment and teaching devices.

V. Conducting practical exercises as adapted to secondary students.

The nature and extent of the last-named group of activities depend chiefly upon opportunities afforded the students for suitable practical work in their agricultural courses and the opportunities for carrying out practicums and field trips in connection with practice teaching. In some cases, even where the students secure practice of a technical nature in connection with their agricultural courses, practicums are planned and conducted in the training class as they would be handled for secondary students. Such work includes: Judging farm animals, judging farm products, testing seed, testing soil for acidity, use of the Babcock test, testing and preserving eggs, and such practical and simple exercises as fit well into the work of a secondary school.

Agencies for the advancement of agricultural education.—Many of the larger educational and scientific institutions and societies have been concerned for a number of years with problems of agricultural education as they relate to the general problems of education and agriculture with which these bodies deal. Chief among the national bodies may be mentioned the National Education Association and the American Association of Agricultural Colleges and Experiment Stations. Scarcely a year passes in which these bodies do not consider some phase of agriculture in the secondary schools. Regional and State teachers' associations very often find time on their programs and place in their reports for consideration of problems dealing with teaching agriculture in the high schools. It has been only within the last four or five years, however, that the problems of agriculture in the secondary schools have been given special consideration. Such special attention has been given chiefly by the following agencies:

1. Division of agricultural instruction, United States Department of Agriculture: In 1903 the Office of Experiment Stations of the United States Department of Agriculture received an appropriation for farmers' institutes and agricultural instruction in the following terms:

To enable the Secretary of Agriculture to investigate and report upon the organization and progress of farmers' institutes and agricultural schools in

the several States and Territories and upon similar organizations in foreign countries, with special suggestions of plans and methods for making such organizations more effective for the dissemination of the results of the work of the Department of Agriculture and the agricultural experiment stations, and of improved methods of agricultural practice, including the employment of labor in the city of Washington and elsewhere and all necessary expenses, \$20,600.

For a number of years work of a general nature, much of it propaganda for the development of agricultural education and farmers' institutes, was carried on by specialists in those two lines. Although the work has continued ever since with the same appropriation and the same authorization, its nature has been changed as the work to do became more specific and specialized. In 1914 a man was employed to give his entire time to the work of the secondary schools. This work is mostly along two lines: (1) Investigating the methods of organization and teaching in the schools; (2) organizing the information secured in the Department of Agriculture and the experiment stations for teaching purposes. Methods gleaned from the study of schools are suggested in connection with the materials organized for teaching. This material is sent out in the form of bulletins and documents. For two years the Agricultural Education Monthly served as a medium for reaching teachers of agriculture. Sets of lantern slides are prepared and loaned to teachers with lecture syllabi.

2. United States Bureau of Education: The Federal Bureau of Education for several years has considered aid to teachers of agriculture as one of its functions, but owing to limited funds it has been necessary to restrict its efforts to a few lines. A specialist in agricultural education has been employed for the past three years. Much of his time has been devoted to investigations concerning higher education in agriculture and the coordination of the whole program of agricultural instruction. The bureau has cooperated with the Department of Agriculture and other agencies in making investigations and has published a number of bulletins reporting the results of investigations and the proceedings of educational societies dealing with agriculture in secondary schools.

3. Conferences on agricultural education: Under the auspices of the Department of Agriculture and the Bureau of Education a number of regional conferences have been held, in which specific problems relating to the teaching of agriculture in secondary schools were discussed. As those attending the conferences were mostly engaged in the colleges as professors of agricultural education, or in State departments of education as supervisors of agriculture, the problems discussed pertained chiefly to training teachers and to the organization and direction of courses of study in the secondary

schools. The reports of these conferences, though not published for general distribution, were made available to those immediately interested.

4. The American Association for the Advancement of Agricultural Teaching: This association was organized in 1909 for the purpose, as stated in its constitution, "to promote the teaching of agriculture and to devise ways and means of increasing the efficiency of such instruction in elementary and secondary schools and in colleges and universities." Up to the present time the association has given most of its time to problems relating to secondary agriculture. Some of the proceedings of its meetings and reports of its communities have been published by the Department of Agriculture and the Bureau of Education. The committee on the use of land by high schools teaching agriculture has done a good deal to develop a rational use of the school farm and to promote the home-project plan.

5. Federal Board for Vocational Education: In addition to the general administration of vocational agriculture, as subsidized with Federal funds, the Smith-Hughes Act charges the Federal Board for Vocational Education—

to make or cause to have made studies, investigations, and reports, with particular reference to their use in aiding the States in the establishment of vocational schools and classes and in giving instruction in agriculture, etc. . . .

When the board deems it advisable, such studies and investigations concerning agriculture for the purposes of agricultural education may be made in cooperation with or through the Department of Agriculture. Such studies, investigations, and reports concerning the administration of vocational schools, courses of study, and instruction in vocational subjects may be made in cooperation with or through the Bureau of Education.

Inasmuch as the work of the Federal board is directly connected with the schools and that it has both authorization and funds for aiding the teaching of agriculture and other vocational schools in a direct way, it looks as if the governmental aid for this phase of teaching would center largely around the work of that board. Plans for cooperation with both the Department of Agriculture and the Bureau of Education have been made. These departments will do investigational work connected with the teaching and administration of agriculture in the secondary schools under the direction of the Federal board.

6. General agencies: Of the general agencies interested in agricultural education the most important at present are the National Education Association and the National Society for Vocational Education. At the present time a committee on agricultural education is working in connection with the commission on the reorganization of secondary education of the National Education Association on a report which promises to be not a reorganization but a

primary organization of secondary agriculture, as this branch of secondary education has never been really organized. The National Society for the Promotion of Industrial Education gave some attention to agricultural education. Now that this society has broadened its field and changed its name to the National Society for Vocational Education, it promises to give a great deal more attention to the problems of vocational agriculture in secondary schools.

Chapter VI.

SUMMARY OF STUDY.

RELATION OF SECONDARY TO COLLEGIATE AGRICULTURE

It is not easy to draw a distinct line between agriculture as taught in the elementary and secondary schools and the colleges. As the teaching of agriculture was developed in the college, it is reasonable to assume that, in its early development, it was of an elementary nature. It has only been in recent years that the land-grant colleges have raised their agricultural instruction to college grade; even now much of the instruction of the colleges for Negroes and some of the other institutions is of a secondary grade. Many of the secondary schools are doing work in agriculture to-day more advanced than most of the colleges were doing a few years ago. The nature of the subject will always present difficulties in drawing lines between agriculture suited for the elementary schools, the secondary schools, and the colleges. The present-day tendency appears to be to consider elementary instruction of a general prevocational nature the work of the elementary schools and the junior high schools, and the work of the agricultural colleges largely the training of scientists and specialists, leaving to secondary schools and departments a large share of the vocational training of farmers.

KIND OF SCHOOLS.

As the teaching of agriculture was extended beyond the colleges, it was assumed apparently that schools of agriculture should be established with land and equipment for practical instruction at the school. Many of the agricultural schools established have not been real agricultural schools. In some cases agricultural departments have been more successful in teaching agriculture than the so-called agricultural schools. The question has arisen as to whether agriculture should be taught in the ordinary high school or in special schools of agriculture. From the study the author has made it would seem that there is place for instruction in agriculture in every high school serving a farming community, if the school is prepared to give the proper training to future farmers. There is also a place for a limited number of agricultural schools of secondary grade. The majority of students should receive their agricultural training in

the public high school while living at home on the farm. The students who are not served by local high schools and the more mature students who wish more intensive training in agriculture the agricultural schools will aid the colleges in training.

PROBLEMS OF VOCATIONAL AGRICULTURE.

The practical training of farmers as undertaken by the schools presents many new problems. While we may agree that vocational agriculture means the training of farmers, we do not know what the schools may do, and just how they may do it, in giving that training. We may learn something from the experience of the agricultural colleges, but their work has been in most cases better adapted to the training of scientists than farmers. High-school instruction has suffered from the college instruction which has in too many cases been taken over without adaptation to secondary students. Some of the secondary schools have taken long steps in the direction of solving some of the problems presented. A survey of what these schools have accomplished should be helpful before new studies are attempted. The author has had opportunity to study a large number of schools teaching agriculture. The chief problems studies are summarized in the following paragraphs:

Use of land.—Placing agricultural instruction upon a vocational basis means making the work practical. Practice in agriculture involves the use of land. Whether the school should own a farm or not is still a question much discussed. Some of the schools visited have used their school farms effectively in giving practical training. Others have been more successful in connecting the training given at the school with practice secured at home through the home-project plan. Other schools have used both the school farm and the home-project plan. It would seem from the study made that there is a place for both, if properly planned, directed, and adapted to educational needs. As a rule the home-project plan works best in agricultural departments of high schools where the students are living at home upon farms near the school. School farms are most needed in connection with agricultural schools where the students are living at the school, away from home.

Utilizing community resources.—In vocational training in agriculture there is a tendency to get away from technical laboratory training and to make the shop and the farm the laboratory of the school. Some of the schools doing most effective work not only use the home farms and the school land for practical training, but also use neighboring farms in the community. In fact, they look upon the entire community as the laboratory of the school and use all its resources as far as possible for teaching purposes. This attitude is exemplified in the Wisconsin normal school described,

which, instead of investing in live stock and equipment for their school farms, invested in auto trucks with which to take classes into the community for field instruction.

Methods of instruction.—Vocational training in agriculture is introducing new problems in teaching. Not that new principles are involved, but that new applications must be made. The lecture method and technical laboratory methods evolved in the college do not function any better in teaching secondary agriculture than they do in teaching other phases of science in the high school. Text, book methods and laboratory training considered successful in science teaching in the high school need considerable adaptation in their application to vocational training in agriculture. The most successful schools based their school instruction upon practical farm projects and constructive work in the field and shop. Teachers were supervisors and directors of training as well as instructors. Classroom instruction of a nature less formal than academic instruction in the high school seems to meet the needs of instruction related to practical work. Individual project study means supervised study. The teacher in the classroom continues as a director and leader as he is out of doors, for a part of the time directing individual study and planning of work and then acting as leader in a round-table discussion of problems and principles of general interest and application.

Organization of subject matter.—The curricula and courses of study in operation in the various schools and suggested in the State plans show that general standards are not established. As a rule, where States have attempted to standardize the work by prescribing curricula and definite courses of study, the work has not been entirely satisfactory. Various sections of most of the States differ so widely in their agricultural needs and educational resources that standardized courses are a handicap unless they offer considerable leeway in their choice of subject matter and its application. The most successful courses noted were those adapted best to the interests of particular classes of students and to the needs of the community in which they live. It should be possible to bring vocational agriculture to a high standard in regard to the quantity and character of the work done without specifying the subjects to be taught.

Equipment.—What has been stated in regard to standardization of courses applies in a large measure to equipment. The two go together to a great extent. Some States have made little attempt to standardize courses and methods of instruction, but have specified equipment in detail. In some cases it would seem that the courses of study and methods were made to fit the equipment, instead of the equipment selected as it was needed in teaching. As long as the idea prevailed that practical agriculture could be taught in the

laboratory or that a school farm is essential to practical training, extensive and expensive equipment seemed inevitable in a plan for agricultural training. The home-project plan and a wider use of community resources have reduced the need for equipment greatly. As the work is made more practical there is a tendency to equip shops and workrooms rather than laboratories. Incubators, pruning tools, hotbed sash, and spraying outfits are apt to be considered more essential than microscopes, glassware, and soil tubes. In some of the schools doing excellent work little expensive equipment was found. The success of the work depended upon the ability and resourcefulness of the teacher, who, with his students, gathered about him inexpensive teaching material, and who used the home farms and the resources of the community to a great extent. A good teacher may overcome the handicap of poor equipment, while a poor teacher has difficulty in making good with the best equipment available.

SUBSIDIZING AGRICULTURAL EDUCATION.

Accomplishments of State aid.—Vocational training in agriculture means a form of training more expensive than instruction in academic subjects. Even where no farm is used by the school, and equipment is maintained at a minimum, the cost is high because a highly trained, high-priced man must be employed to supervise and direct the work of relatively few pupils. The home-project method may be inexpensive as far as equipment is concerned but expensive for instruction and supervision, as one man can supervise but a few pupils. Realizing the importance of agricultural training and considering its cost, the majority of the States had provided, in some way, to encourage and support the work with State subsidy. While much of the money was misspent, because rational plans were not made and adequate supervision and inspection provided, most of the agricultural instruction worthy of consideration as a special branch of education was developed up to 1917 under the stimulus of State aid. It is to the success of State-aided agricultural instruction that we must accredit Federal aid for that work.

State systems as models.—It was the States which provided distinctly for vocational agriculture and made provision for supervision that the work might be carried out upon a distinctly vocational basis that contributed most to a national plan for vocational agricultural education. In this study considerable attention has been given the work done in Massachusetts, New York, Pennsylvania, New Jersey, and Indiana, because it was upon the work accomplished in these States that the Federal act for vocational education was modeled to a great extent. The chief purpose of the Smith-Hughes Act was to stimulate other States to provide for vocational education, including agriculture, as the above-mentioned States had done. We may

continue to study what has been done in these States with profit, because they have had several years' start in working out problems. The author has received many suggestions from visiting schools in New York and Massachusetts which have been helpful to other States. The home-project plan and practical use of school land have been worked out well in some of the schools and departments in those States. The problem before us now is to adapt methods worked out for conditions in those States to meet conditions as found in other sections.

The granting of Federal aid undoubtedly means a new epoch for agriculture in the secondary schools, not only because of the direct financial aid and the State aid which it stimulates but also for new policies established and new standards set. Although the matter of organization and administration is left largely with the States, there is little doubt but that the tendency is in the direction of national standards. While it is too early to determine the extent to which national standards are going to effect work already started under State aid, it has been considered worth while to make a study of the various State plans for purpose of comparison.

For the present, most of the effort of the State departments of education is centered upon vocational agriculture as established according to Federal standards. The question arises as to whether other forms of agricultural instruction in secondary and elementary agriculture are to be neglected. It is a question whether specialized vocational training in agriculture may be maintained in an extensive way without more attention to vitalizing the instruction in general agriculture. Linking instruction in general agriculture in the upper grades, the junior high school, and the lower grades of the high school with boys' and girls' club work and other home work should serve in an excellent way as prevocational training for agriculture.

Although the matter of dual control has been passed up to the States, there are few States in which the administration of vocational education is not linked closely with the administration of general education. Inasmuch as there should be close relation between the elementary or prevocational work and vocational training, the supervision of both lines should be under the same direction.

Teacher training.—As the success of the work in the secondary schools depends in such a large measure upon the training of the teachers, the Federal funds provide for this important work. Some progress had been made in developing departments of agricultural education before Federal aid was given through the Smith-Hughes Act. The Nelson amendment to the Morrill Act provided that some of the funds for the land-grant college could be used for training teachers of agriculture. The author had made some study of teacher training as conducted in these colleges, and found that courses in

agricultural education varied from courses consisting chiefly of the subject matter of general agriculture to courses consisting chiefly of general methods in education.

We are now in the process of developing special methods and means of organization in agriculture. Along with this development, agricultural education is being developed as a special line in the teaching profession. A great deal, probably too much, is expected of teachers of secondary agriculture. They are expected to know both the art of farming and the science of agriculture along general lines, as well as the art of teaching and the science of education. Departments of agricultural education are finding that this broad training can not all be given in the college. To secure men who have good prospects of succeeding in departments of vocational agriculture from the start, they are reaching out for men who have had either experience in farming or practice in teaching or both, and then rounding out their training in the college.

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