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AGRICULTURAL TEACHING

PAPERS PRESENTED AT THE FOURTH ANNUAL MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF AGRICULTURAL TEACHING

WASHINGTON, D. C., NOVEMBER 11, 1913

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APPENDIXES.

AGRICULTURAL TEACHING.

I. AIMS AND POLICIES OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF AGRICULTURAL TEACHING.

By RUFUS W. STIMSON, Massachusetts Board of Education.[1]

1. PURPOSE OF THE ASSOCIATION.

The purpose of the American Association for the Advancement of Agricultural Teaching, as stated in its constitution, is "to promote the teaching of agriculture and to devise ways and means for increasing the efficiency of such instruction in elementary and secondary schools and in colleges and universities."

2. POLICY.

The time is opportune perhaps for discussing what ought to be the immediate policy of our association in putting its purpose into effect. One matter has already been settled. It has been agreed that for the present our efforts shall be centered principally upon promoting the teaching of agriculture in the secondary schools, by devising ways and means of making that teaching more efficient. One who has marked the recent multiplication in the number of secondary schools attempting to teach agriculture can not but commend restriction of attention to the important problems which these schools present.

You may wonder if there ought not to be agreement at an early date on at least four other matters of policy:

(1) *Independence v. affiliation.*—It has been suggested, for instance, that this association ought to affiliate itself with, or be merged into, one or another of certain larger associations. The National Education Association has given more or less attention to the teaching of agriculture. The National Society for the Promotion of Industrial Education proposes to deal with ways and means of making vocational agricultural teaching efficient. There is to be a discussion to-night before this convention of the question whether our association should become a part of the Association of American Agricultural Colleges and Experiment Stations, with a section set apart at the annual conventions of that association for our deliberations.

The founders of our association would hardly have found it necessary to set up a separate organization if the provisions of the National

[1] At the meeting of the association in Washington, D. C., Nov. 11, 1913.

Education Association had been adequate to their needs. The teaching of agriculture is in part vocational, but also in part cultural; our association therefore represents interests and activities broader than those of the National Society for the Promotion of Industrial Education. Impediments to becoming part of the Association of American Agricultural Colleges and Experiment Stations may be found in the fact that a considerable body of useful members of our association are not eligible to membership under the present constitution of that association, and that amendments for making them eligible and creating a section for our purposes might not be favored.

The main motive which has led the executive committee of our association to hold the annual conventions of 1911, 1912, and 1913 in connection with the conventions of the agricultural colleges and experiment stations has been the desire to impress upon the administrative officers in charge of higher agricultural education and research the needs of the agricultural education service in secondary schools. Presidents and deans have listened to our papers and committee reports and have participated in our discussions. It is doubtful if anything more could be gained by organic affiliation. The present plan has been convenient and may be continued at will. We now are masters of our own ceremonies. Unless the discussion to-night discloses advantages from affiliation which are not now apparent, we may agree that our association should continue the policy of independence of, but of close association with, the organization of agricultural college men and experiment station men.

(2) *Printing.*—Another matter of policy on which we should now agree relates to printing. Heretofore the expense and responsibility of the association for printing has been little or nothing.

(*a*) *No official news organ.*—Ought the association to undertake to establish and maintain an official organ for news and for interchange of views as to ways and means of increasing the efficiency of agricultural teaching? Or can some existing publication be made to meet these needs of our members? A resolution will be introduced during this convention which will call upon you to decide this question, at least for the coming year. If arrangements are made which prove to be reasonably satisfactory to all concerned, heavy labor and financial responsibility on the part of the association may be avoided.

(*b*) *Convention proceedings.*—As you will recall, the United States Bureau of Education published the papers and committee reports of the 1912 convention in its Bulletin No. 522. It also printed those of the 1911 convention. We are now informed that a like courtesy will be extended us in connection with the present convention. When we consider that approximately 7,000 persons were found who might well be expected to profit from receiving copies of the bulletins for last year, we can readily appreciate the important service which has

been rendered our association and the cause we represent by this arrangement. A resolution will be introduced to-day which will enable us to express our gratitude for this service, and to determine what shall be our attitude with reference to continuance of this policy of cooperation with the United States Bureau of Education.

(3) *Membership.*—Our policy with reference to printing will have an important bearing upon our policy with regard to membership. Let us assume for the moment that our expense for printing proceedings and other matter of interest to our members will continue to be no heavier than hitherto, and that, therefore, we are free to determine our membership policy unhampered by financial considerations.

We may then raise the question as to whether or not we ought to aim at the largest possible membership. There are at least 2,500 teachers giving agricultural instruction in secondary schools. Considering our purpose in its broadest scope, ought we, moreover, to include all agricultural teachers in elementary schools, in colleges and universities, also all extension service instructors, including county and other field agents? What man or group of men among us could undertake to round up and satisfy the reasonable needs, not to say demands, of such a membership? Ought it to be the duty of our secretary to bear the brunt of this, or of our executive committee? The numbers are coming to be enormous. Such a membership may well be looked upon as impossible of contemplation.

What, then, ought our membership policy to be? A membership at the same time wieldly and extensive, at the same time representative and restricted, at once suggests itself.

(*a*) *Professors of agricultural education.*—Pursuant to the so-called "Nelson Amendment," making appropriations to the land-grant colleges, 60 or more professors of agricultural education should presently be at work throughout the country, men charged with the duty of training teachers of agriculture. These men will be at the main source of supply. Surely every man among them ought to be a member of this association. Every State in the Union would thus be represented, and yet our membership would be kept within reasonable bounds.

(*b*) *State administrative officers.*—In addition, there will presently be at least one administrative officer in every State in general charge of agricultural education in the schools. These men will be responsible in large measure for the distribution and direction of the men who have been trained by the professors of agricultural education to be teachers of agriculture. In short, it will be the duty of these men to pass judgment upon the efficiency of the output of the college departments of agricultural education, to muster in the raw recruits and see how they behave under fire. Surely every such administrative officer ought to be a member of this association. Every

State in the Union would thus, again, be represented, and our membership would still be kept within the working bounds of our present plan of organization.

(c) *Membership campaign.*—Ought we not, therefore, to aim at a complementary membership made up of fifty or sixty men from the sources of supply and an equal number from the points of utilization of agricultural teachers? Each group would be a check upon the other. Either must remain more or less blind and helpless without the other. This combination, at our present fee for membership, would yield a revenue of approximately $100 a year, a sum ample to meet our present needs for postage, stationery, and stenographic service in connection with the secretary's office and reports of committees. For promoting the efficiency of agricultural teaching in the secondary schools, such a complementary membership might well prove to be ideal, and no individual in such a compact membership would object, we may be sure, to an increase in the membership fee to $2, $3, $5—to any sum found necessary to get good work well done.

II. HOME PROJECT WORK v. LABORATORY AND SCHOOL GARDEN PLAT WORK FOR HIGH-SCHOOL STUDENTS.

By C. G. Selvig,

Superintendent Northwestern School of Agriculture of University of Minnesota, Crookston, Minn.

In so new a field as the teaching of agriculture by high schools it is yet too early to dogmatize regarding what to do and how to do it. The very success of the movement up to the present time has been due to the absence of hard and fast rules and freedom from regulations—a condition out of which have developed initiative and new ideas. The movement has assumed proportions great enough to warrant inquiry as to the trend of high-school agricultural teaching and as to the results that have already been attained. Such an inquiry will assist new schools beginning the work, as well as point out successful lines of effort in schools already in the field.

In nearly all schools where a special instructor for agricultural subjects is provided, some work is done with land. It has become common to speak of this land as the school farm, and this term will be used in this paper. The Putnam Act in Minnesota, passed in 1909, and subsequent acts increasing the number of schools teaching agriculture in that State to about 140, provided that each department, to receive State subsidy, must have a school farm.

Before discussing the specific topic assigned me, it seems necessary to define what is included under "high-school agriculture." It is not the textbook agriculture taught by the high-school science teacher, the manual training instructor, or by superintendent or principal

without special agricultural training. Something may be accomplished under such conditions, and an inquiry regarding land used in connection with such courses in agriculture might well be made. It would lie outside the scope of this paper, however, as I refer to a vocationalized agriculture taught by a man trained at an agricultural college who is provided with the necessary facilities in time, in money, and in equipment to make satisfactory progress.

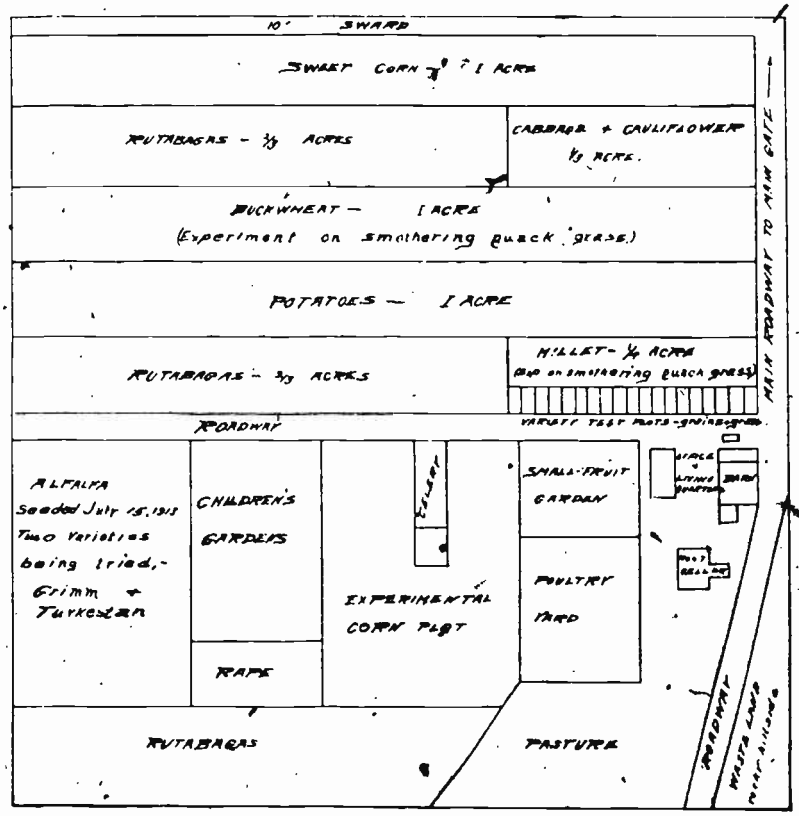

FIG. 1.—Cloquet High School, Cloquet, Minn.—Plan of 1913 school farm.

A great deal of money is now expended for this kind of high-school agricultural work; it is obvious to all that a great deal more will be spent in the future. This expenditure, if the policy is to persist, must be of the sort that will give the best and most practical returns, educationally and materially. What is the final purpose of agricultural teaching in high schools? Is it to train future farmers? Is it simply to vitalize and apply high-school science teaching in rural high schools? Or is it to make of agriculture for all high schools a cultural-science subject dealing with one of the world's basic activities? Which is it to be?

In Minnesota and many other States high-school agriculture as at present organized purports to train future farmers. It seeks to serve as a means of introducing better farming into each community and as a local center for infusing enthusiasm and life into the rural homes that surround the high school. Incidentally, it may be said, this kind of agricultural training has turned young men's minds toward agricultural teaching, and has assisted in creating a higher appreciation of agriculture as a vocation requiring scientific training and large power of organization and business initiative. Educators, business men, agricultural leaders, and farmers look to the high-school agricultural department to present vocationalized agriculture that will count, first, in the later work of the students on the farms; and, second, in the work of the farmers on their own farms. To me these results should be expected and demanded. I do not believe, however, that high schools alone can influence and vitalize the entire agricultural activities of their communities. This is obviously too big a task for them. They could not do it if they would. What they should do, and what they are doing, day by day, is to occupy an important place in the State's organized effort to promote a better agriculture. They are a local contact point between the farmers and all the agencies that are at work. Schools on every hand are, and should be, community leaders. Agricultural high schools should be leaders in agriculture. County agricultural agents and high-school departments of agriculture form a strong cooperative association for team play in improving rural conditions and rural homes.

The scope of this paper is limited to facts involved in the use of the school farm and in other work with land which will promote the general ends of school agricultural training.

I can best do this, I believe, in tracing the development of school farm work in Middle West high-school agricultural departments. The school garden work came first. The importance of this in rural communities was limited, and the schools did not long require the gardens. Most schools now furnish plats for landless children in the grades, and much good is done in that way. In casting about for work to do, the schools next conceived the idea that the only way in which they could make a record was for each school to maintain a miniature experiment station, with a bounden duty to discover new agricultural facts. This plan resulted in the only outcome possible—a complete breakdown and failure. Many schools came to feel, after these attempts, that there was no work that could profitably be done on the school farm.

Up to this time agricultural extension work had been mostly lectures and talks. Farmers' institute workers, extension workers, "up-to-date" farmers, and agricultural college leaders were talking about new and improved practices. There was very little demon-

stration work: Seed corn needed improvement. Alfalfa had stood knocking at the door for years, but had not been admitted. Rotations, which, with proper fertilizers, were known to investigators to be imperative in any scheme of permanent agriculture, needed practical demonstration. New crops, eminently suitable as feeds, hitherto untried in most of the communities, needed to be tried. Potato seed needed attention. Tile drainage was a mystery to many. And so on. Practical demonstrations were the crying need of the day. The high-school students in agriculture needed them. The farmers

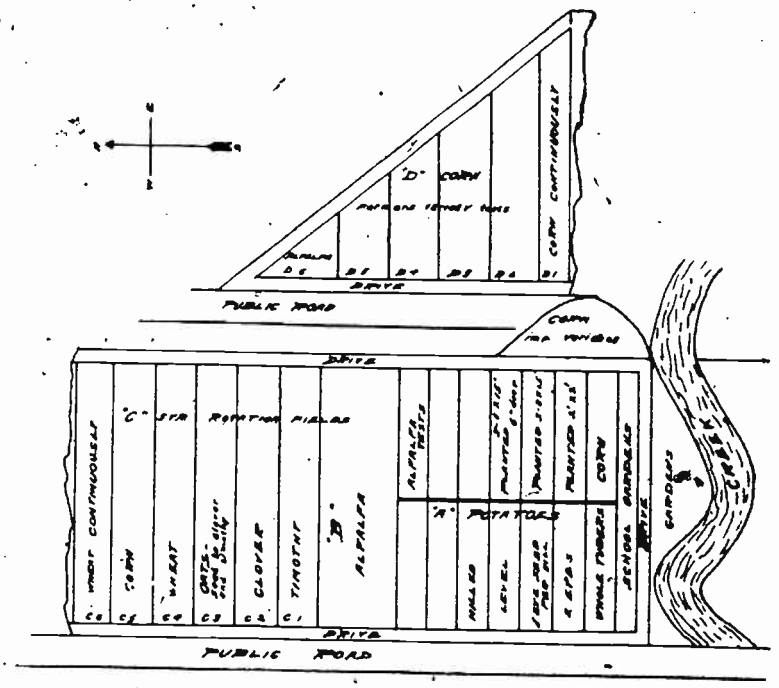

FIG. 2.—Jordan High School, Jordan, Minn.—Plan of 1913 school farm.

needed them. In response to this demand, practical demonstrations became the work of school farms in many sections.

In order to ascertain something definite regarding the actual school farm plans, the following questions were sent out to 150 high schools having agricultural departments:

Has the school a plat of land? How many acres? Are the students required to do the work on the school farm? Name the projects being worked out on the school farm. Make a drawing of the plats (1913). Are the students required to do any home project work in connection with their course in agriculture? If so, state nature of work and results. Does the agricultural instructor carry on special work with farmers regarding the use of their own land? If so, state nature of work and results. Enumerate features of work on school farm, with home projects, or with farmers, that have given the best practical results.

The replies show that valuable demonstrations have been given. Results have been obtained at a cost entirely commensurate with their value. Handicaps, such as poorly prepared instructors, their frequent if not almost yearly changes, and the newness of the problem, have been many; but the results from the work with school land have been on the whole successful. I shall not take time to elaborate this point.

Experience with the work, and knowledge of it, justify the following observations and conclusions:

1. From 2 to 4 acres of land can be used advantageously in connection with any high-school department of agriculture.

2. The work should be, for the present and until home-project work and work with farmers are both well organized, purely demonstrational in its scope and character.

3. The school farm should be the laboratory and should supply the laboratory material for the students in so far as land and its products can supply those needs.

4. The high-school students in agriculture should do as much work on the school farm as is possible within the school year.

5. The instructor should be in active charge of the school farm work. He removes a great handicap to his prestige among farmers if he can care efficiently for the school plats, even if he hoes the corn himself.

6. The instructor should be allowed manual help in the school farm work, to enable him to devote himself to other work more valuable.

7. The community should not expect the school farm to be self-supporting. Conditions surrounding small hand-labor plats make this nearly impossible.

8. A limited amount of State supervision should be exercised over the school farms, to expose promiscuous, haphazard, half-baked plans before they are consummated. The needs and conditions of the locality should be considered first. Enthusiastic specialists should not be allowed to exploit vaguely practical theories as accomplished definite facts.

9. The high-school farm work should be demonstrational and not experimental. It should be a community contact point for promoting better farming.

There are distinct values which may be secured by a high school's use of land, but the function of the school farm is limited. Too large a share of the funds for maintenance of the department should not be diverted to the school farm.

School farm demonstration work in high schools.—Corn improvement. Alfalfa. Rotation demonstrations. Cultural methods. Variety work with grains, grasses, forage crops, and fiber crops. Fer-

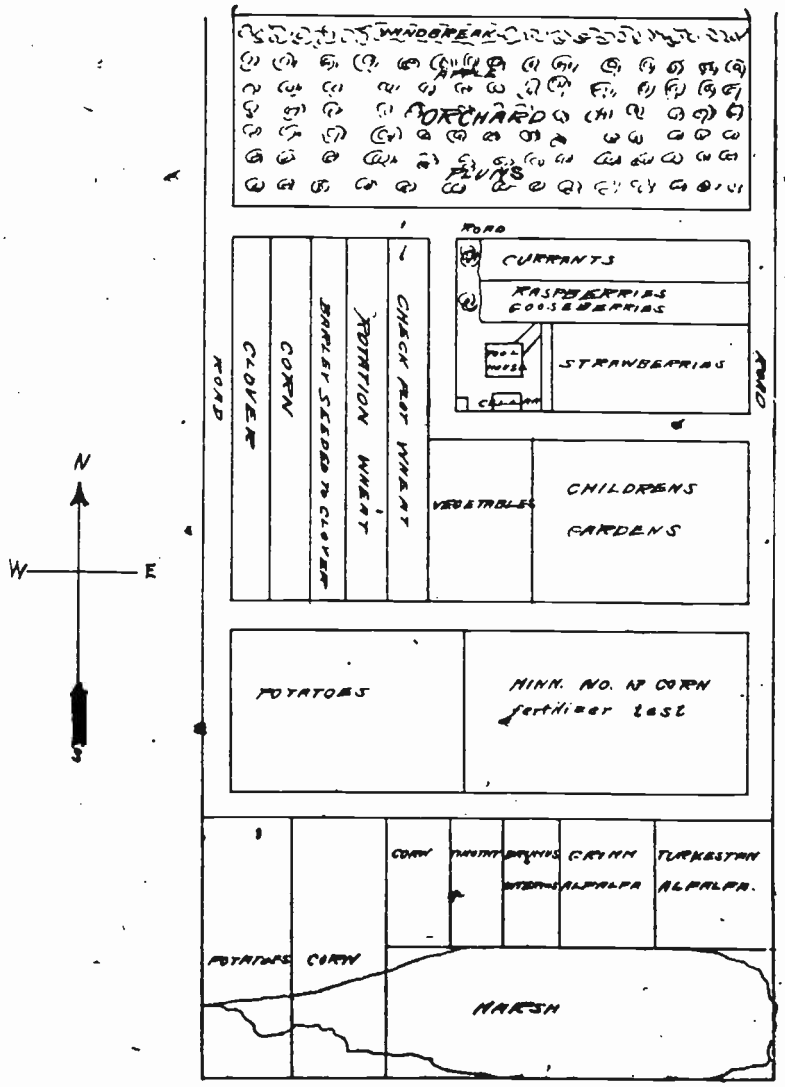

FIG. 3.—Alexandria High School, Alexandria, Minn.—Plan of 1913 school farm.

tilizer tests. Drainage work. Land clearing. Work with soiling crops for feeds. Potatoes. Orcharding, including grafting and pruning. Grasses. Garden vegetables. Seed curing, storing, testing, treating, and cleaning.

HOME-PROJECT WORK.

School farm demonstration work alone does not cover the entire work with land. What the school farm can seek to do has been pointed out. Naturally the field is a restricted one. The limitations of the work have been realized by many who wish to extend the benefits of high-school agricultural teaching as widely as possible. They have turned to other plans to supplement the work of the school farm. Home-project work both for demonstrational and for practical purposes, as well as work on the farmers' own farms under direction of the agricultural teacher, is the means employed. This work is new. Out of nearly 150 replies received, only about a dozen report that home-project work was required during the last season. Most of them say, however, that they "intend to require it," or that "it will be encouraged," or "it will be optional." Those schools that have begun home-project work state that it is their most successful venture. Several schools report that they have given up their school land and have substituted home-project work and work with farmers on their farms instead. Several new schools, just beginning, are hesitating between the school farm and this other plan.

After two years of experience with home projects, I am confident it will become a very effective work when it is properly organized. Every line of demonstrational work that can be carried on on the school farm can be made a home project. It has greater value if done by a farmer's boy at his home than if done at the school farm. Persons who have thought much about the psychology of demonstrational work know that such work done by the National Government, the State experiment stations, or the schools has less effect than if done on actual farms by farmers themselves.

If alfalfa is a good crop to grow, it is advisable to have it grown on the home farms as well as on the school farm. Landless boys can be allowed to use the school farm in lieu of land of their own. The home-project work will naturally include other lines than work involving the use of land, but these lie outside the scope of this discussion. The projects should be graded very carefully and choice allowed between groups requiring equal work. Cost accounting, a complicated subject in school farm work, which is, however, a most important item in agricultural production, can easily be secured in individual home-project work.

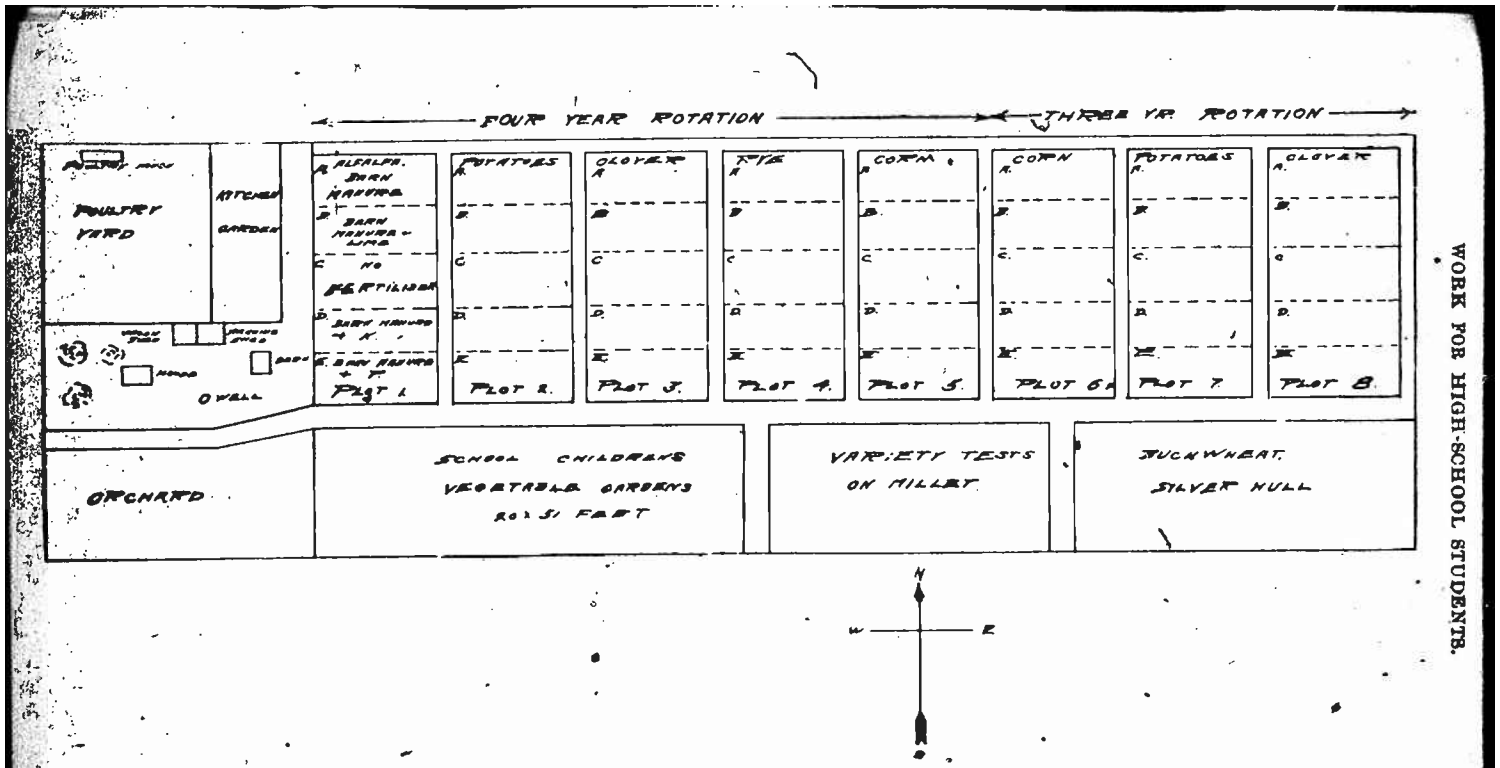

FIG. 4.—Bemidji High School, Bemidji, Minn. Plan of 1913 school farm.

The United States Department of Agriculture and the extension divisions in many States have organized the acre-yield contests, which are a form of home-project work. There is an appeal to the boy's own resources in this kind of work. It quickens his sense of responsibility. It serves as well as a demonstration to his farmer neighbors. It gives a valuable agency for the agricultural colleges to secure data regarding farming conditions of the various communities of the State. It results in securing increased local activity in promoting better agriculture. It multiplies an instructor's usefulness, because he can outline, organize, and inspect 100 home projects with less work and time than he can carry on one at the school farm. Money expended for this supervision is returned in greater measure through (1) acquaintance with farming conditions, (2) contact with the boys and with their fathers on their farms, and (3) to suggest proper organization of the farm itself.

Home-project work in connection with the use of land.—Acre-yield work. Ear-to-row corn tests. Improved seed plat work. Vegetable garden work. Alfalfa. Potatoes. Summer forage crops for farm animals. Establishing a rotation. Drainage and irrigation work. Fertilizer tests. Seed laid proportion and cultural work. Planting farm and home grounds; orcharding; spraying and caring for fruit trees.

Other home-project work.—Dairy herd records. Cow testing. Establishing rations. Poultry. Silo building. Concrete work. Planning farm buildings. Township surveys. Field collection of insects.

WORK WITH FARMERS.

This has been touched upon in connection with home-project work for high-school students in agriculture, and it is work which can be carried on at the same time. It is recognized as an integral part of the high-school agricultural movement in Minnesota, and many splendid results have already been attained. One school reports, as a result of the work of the high-school department, that 60 farmers are using improved seed corn grown on the school farm; another, that 100 farmers have begun to grow alfalfa; another, that 50 acres of alfalfa were sown in 1913 in that community.

SUMMARY.

1. School farm of limited area is needed, first, to provide school laboratory material; second, to provide land for garden and home-project work for landless students; third, to demonstrate principles and crops suited to type of farming in the community.

2. High schools should require home-project work of all students taking agriculture. The project must be carefully selected, graded

as to scope and work involved, practicable, supervised, and the cost must be accounted, reported, and credited.

3. High schools can easily and effectively carry on all demonstration work at same time on farmers' own farms. This is possible by working in cooperation with county agents, and with the extension divisions of the agricultural college. Work with farmers' clubs will naturally follow during the winter months.

4. The agricultural college of the State should supervise, in an advisory relation, the school farm, the pupil's home project, and the farmer's project work to insure sameness in method and scope of work as well as continuity of plan.

Under such plans, carried out as far as practicable and under the conditions surrounding them, the high schools can use land to good advantage, and excellent results will follow.

DISCUSSION.

By W. R. HART, Amherst, Mass.

These three activities—home projects, laboratory experiments, and garden work—represent different modes of attack. They are not antagonistic. They complement each other. Each has some advantage peculiar to itself. The home project has an economic value superior to the others. This economic value, however, consists more in its immediateness in returns than in its inherent worth. The real worth of a laboratory or garden experiment is to be measured by its educational and its economic value. Its economic value can not be computed in terms of profit and loss. But the indirect and remote economic value may be greatly superior to the economic value of a home project, on account of the demonstration of some principle. The inherent worth of an experiment in the laboratory depends upon the scientific insight it may promote. Laboratory experiments are made with all the conditions under control. Garden experiments are made with most of the conditions under control and all controllable ones under supervision. If a mistake is made in a cropping project, it may be corrected at once in the school garden. In the home project, a mistake in procedure may not be discovered till too late for correction.

In the effort to arrive at the comparative worth of these three aspects of the teaching processes, it must be remembered that the home project, the laboratory, and the garden all have values. Each has values not easily computed in terms of the other. It may be said further in regard to the school-garden project, that it may be made to serve both a scientific and an economic function. Being under the direction and constant supervision of the instructor, it partakes of the nature of a scientific demonstration. Being flexible in the matter of size, it may easily be made an enterprise of importance, fully equal to the home project. In the case of pupils who have no available home equipment, the garden project must be resorted to as a substitute.

The end sought in agricultural instruction determines the relative importance of these three methods. Those who regard technical efficiency in the arts of agriculture, coupled with economic gain, as the chief end will feel a bias for the home project. The laboratory and supervised garden will appeal more strongly to those who look upon scientific insight as the important thing. Simple manual dexterity or skill is of minor importance from either point of view. Agricultural tools are not very delicate. The handling of such tools is by no means a fine art. Learning to handle such tools has not a high educational value. But learning when and why soils, plants, and animals should receive a given treatment is educative in the highest degree.

Detailed Analysis.

Abstract of reports from various schools on use of land in agricultural teaching, prepared by C. G. Selvig in connection with his paper.

Questions.

1. Name of school. .....
2. Instructor. .....
3. Has the school a plat of land? ..... How many acres? .....
4. Are the students required to do all the work on the school farm? .....
5. What projects are being worked out on the school farm? .....
6. Make a sketch of the (1913) plats on opposite side of this sheet or on a separate sheet.
7. Are the students required to do any special work on their home farms in connection with their course in agriculture? ..... If so, give the projects that have been selected. State, also, the nature of the work done and the results. .....
8. Does the agricultural instructor supervise the work on the school farm? .....
9. Does he carry on special work with farmers regarding the use of their land? ..... If so, enumerate projects that have been selected and give results. .....
10. Remarks. Speak of features which have given you the best practical results.

Reports from various schools on use of land in agricultural teaching.

[Numerals at top of columns refer to full questions in preceding list.]

1. Name of school.	3. School land? Number of acres.	4. Students do all farm work?	5. Projects of school farm.	7. Special work on home farm.	9. Special work with farmers.	10. Features with best results.
Fort Lewis School of Agriculture, Colo.	Yes; 2,000 acres	No	Potatoes, grain, alfalfa	Not required	Yes; school is new.	
Second District Agricultural School, Ga.	Yes; 315 acres	Yes	Fertilizer tests, variety tests, field culture tests, forage crops, grasing crops for swine.	No	No	
Third District Agricultural School, Ga.	Yes; 400 acres	Yes	Training boys to be good practical farmers	No	No; have cooperative farm demonstrations in each county.	One day practical work on farm, orchard, garden, stock, machine.
Lenox College, Iowa	Yes; 30 acres	No	Alfalfa, vetch, sweet clover, oats for hay, liming soil	No	No	
Berea College, Ky	Yes; 150 acres	No	Use of silo, crop rotation, gardening, fruit culture, testing, fertilizer and lime.	No	Yes; one instructor spends one-half time with farmers; projects same as on own farm.	Farmers' chautauqua; lime; cow peas; drainage.
Seventh District Agricultural and Mechanical School, La.	Yes; 240 acres	Yes	Mixing fertilizers, fertilizer test for amount of different elements, variety tests, general farm crops.	They make tests	Yes	
Calvert High School, Md.	No	No	None	Weekly reports on home farm projects, such as spraying fruit, different fertilizers, rotations.	Yes; advises and holds meetings.	Pupils report home work, seed testing.
Sparks Agricultural High School, Md.	Yes; 10 acres	Handwork by students.	Experimental orchard; varieties of small fruits; work with grasses; variety test of wheat and barley; garden.	Yes; required to carry on a project for three years; corn work; potato seed selection; cost accounts; county survey work; pototo and corn growing contest.	Yes; variety test of corn; wheat test; fertilizer test; spraying and pruning of orchards; alfalfa plat.	Cow test work; evening rural lectures; corn and potato exhibit.
Harwich High School, Mass.	No		Work done on home farms; cranberry culture	Gardening; corn work.	Yes; spraying fruit trees and cranberry vines; fertilizer test.	

Reports from various schools on use of land in agricultural teaching—Continued.

1. Name of school.	3. School land? Number of acres.	4. Students do all farm work?	5. Projects of school farm.	7. Special work on home farm.	9. Special work with farmers.	10. Features with best results.
Hopkins Academy, Mass.	Yes; 5 acres	No	Rejuvenating orchard, corn work	Yes; home projects; corn; potatoes; dairy herd; market garden; orchard.	Very little	
Northboro Agricultural High School, Mass.	Yes; ¼ acre	Yes	Gardening, hotbeds, nursery	Home gardening; corn and potato raising.	Yes; fertilizer experiments on grass; alfalfa; spraying; pruning.	All.
Oliver Ames High School, Mass.	No		None	Yes; gardening; poultry; corn, potato, tomato growing.	Alfalfa; top dressing hay land; herd records.	Did not keep boys busy all the time.
Petersham Agricultural High School, Mass.	Yes; 10 acres	No	Landless students use school land; no definite use of school land.	Yes; required; gardening, with cost accounting.	Yes, when asked; pruning and spraying.	Stock Judging.
Smith's Agricultural School, Mass.	Yes; 93 acres	No	Spinach, ear-to-row corn tests, sweet corn, field corn, hot beds.	Home project work required; landless boys required to seek supervised employment with up-to-date farmers; rearing chickens; laying concrete barn floors; raising potatoes; dairying; corn growing.	Yes, to limited extent in cooperation with agricultural college. Alfalfa, grass growing; cost accounting.	Individual matter with each farmer.
Dunbar School, Mich	Yes; 600 acres	No	Pure-seed production; pure-bred cattle raising; fertilizer tests; liming, drainage work, gardening, spraying.	Not up to present time; school is new.	Yes; weed eradication; fertilizer test; liming soils.	Pure seed. Potato seed distribution; promoted rotation.
Agricultural and Mechanical College, Miss.	Yes; 2,500 acres	No	Demonstration plats; economic crops; practical demonstration in field.	No	Yes; feeds, fertilizer; selection of animals; plants; drainage projects.	Practical demonstion; cooperative farm work.
Holmes County Agricultural High School, Miss.	Yes; 43 acres	One-half	Building up of soil; new school	No	Yes; preparation of seed bed; rotations.	New school; grow legumes.

Jones County High School, Miss.	Yes; 40 acres	Yes	Use of legumes; terracing land; winter cover crop; no experimental work; demonstration.	Not required, but advised.	No; only in an advisory way.	Silos.
Sunflower Agricultural School, Miss.	Yes; 20 acres	Yes	No experimental work. Demonstration: Growing cotton, corn, clovers, peas, rape, and vegetables.	No	No	
Union College, Nebr.	Yes; [illegible] acres	Yes	Very little experimental work; corn, alfalfa, fruits, vegetables.	No complete course yet established.	No; test milk for farmers.	Dairy work.
College of Agricultural and Mechanical Arts, N. Mex.	Yes; 200 acres	No	Experiment station has various experiments in crop production, horticulture, animal husbandry.	No	Cooperative experiments with farmers.	
Morrisville State School of Agriculture, N. Y.	Yes; 200 acres	No	Plant breeding; horticulture; garden; potatoes—variety and demonstrations; variety, cultural tests, and breeding of corn; alfalfa; fertilizer demonstration.	Yes; in connection with crop work and general observation.	Not yet; planning something along this line.	Alfalfa; fertilizer and work.
State Agricultural High School, Alfred University, N. Y.	Yes; 231 acres	No	Fertilizer experiments; feeding dairy cattle; use of lime; test of variety of different farm crops; alfalfa plats.	No; but they must have worked on a farm for six months before they will be graduated.	To some extent	Renovation of orchards; use of lime; selection of seed potatoes.
State School of Agriculture and Lawrence University, N. Y.	Yes; 166 acres	No	General agricultural course	No	No	
Beach, N. Dak.	Yes; 10 acres	No	Demonstration: Growing of forage crops; alfalfa; seed corn; sugar beets and broom corn; wheat breeding; flax work.	Planning for next year.	Yes; pure seed tests; work among farmers.	Farmers club work.
La Moure Agricultural School, N. Dak.	Yes; 13 acres	No; will do more next year.	Alfalfa, rotations, permanent pasture, orcharding, gardening.	Expect to require students to have home work.	Yes; seed selecting contest.	
North Dakota School of Forestry.	Yes; 35 acres	No	Supplying people with trees, grains, grasses, gardening, alfalfa.	No	No	Test of grasses and alfalfa; garden experiments.
State Agricultural School, N. Dak.	Yes; 12 acres	No	Varieties of grains, grasses, rotation, alfalfa, seed-corn work, improved potato seed, variety tests of potatoes, cucumbers, wheat.	Optional; work with onions, seed corn, alfalfa, tomatoes.	Yes; introduced seed corn of hardy variety; variety test of corn.	Seed-corn work.
Miami University, Ohio.	Yes; 40 acres	Only part.	Corn breeding, fertilizer test, truck gardening, fruit work, forestry, potato breeding, alfalfa, field-crop demonstrations.	Yes; ear-to-row corn work; not much home work was possible.	Some; fertilizer work, milk records, stock-feeding rations.	Corn breeding; work of this school is to prepare agricultural teachers.
Agricultural and Mechanical College, Okla.	Yes; 600 acres	Voluntary	Cultivation of land; principal crops of this section			
Cameron State School of Agriculture, Okla.	Yes; 160 acres	No	Irrigation; experimental and demonstration work covering all crops; seeds, varieties; deep, shallow, early, late, fall, winter, and summer plowing.	Will be added next year.	Some; demonstrations.	
Panhandle Agricultural Institute, Okla.	Yes; 80 acres	No	Raising good seed, drouth-resisting types; variety tests, fertilizer tests, methods of culture test.	Not worked out yet; plan for future.	Yes; dryland alfalfa.	Too new to draw conclusion.

Reports from various schools on use of land in agricultural teaching—Continued.

1. Name of school.	3. School land? Number of acres.	4. Students do all farm work?	5. Projects of school farm.	7. Special work on home farm.	9. Special work with farmers.	10. Features with best results.
Elizabethtown College, Pa.	Yes; 14 acres	Not all	Orcharding; berry and grape culture	No	Supervising orchards.	Spraying, budding and grafting.
National Farm School, Pa.	Yes; 360 acres	Yes; all	General farm No. 1, 40 acres; milk and truck farm No. 3, 165 acres; 2 farms, 40 acres and 117 acres, are used for instruction, with 2 experimental orchards and 1 vineyard.	No; all come from city.	No	
State Forest Academy, Pa.	7-acre nursery, 23,000-acre reserve forest.	No	Fertilizer for forest tree seedlings; results of exposure of seedlings; germination test for forest tree seeds; effect of thinning on tree growth; wood production of different varieties; forest planting experiment.	No	Yes; some advisory planting; fertilizer experiments.	
Vermont State School	Yes; 90 acres	No; part of it.	Exemplify productive and profitable farming; spraying; fertility of soil; alfalfa growing.	No stated work has been attempted.	No definite work; county agents do this work; encouraged test of milk; pruning and spraying; growing potatoes.	Our mission is to fill Vermont boys with enthusiasm for farm life in this State.
West Virginia University.	Yes; 93 acres	Little	Vegetable gardening	Practical work in these subjects on the farm.		
Grace State High School, Wis.	Yes; 5 acres	No; a part only.	Crop rotation; deep plowing; use of manure and lime; alfalfa; gardens.	Yes; selection and testing of seed corn; garden work.	Where possible	New.
Ellsworth High School, Wis.	Yes; 10 acres	Some of it.	Fertilizer test; alfalfa growing; use of lime; pure-bred seed work; garden vegetables.	Some have gardens at home; acre-corn contest work.	No	Pure-bred seed contest; alfalfa.
Marinette County Agricultural School, Wis.	Yes; 6 acres	No	Demonstration: Potatoes, corn, soy beans, oats, and vegetables; little experimental work.	Just beginning that work.	Yes; fertilizer on muck soil; garden truck.	
Winnebago County School of Agriculture, Wis.	Yes; 11 acres	No	No particular projects at present	Intend to carry on special work with students.	Yes; cooperative work in fertilizers.	All new men at school.

Reports by Minnesota high schools on use of land in agricultural teaching.[1]

[Numerals at top of columns refer to full questions on p. 18.]

1. Location.	3. School land? Number of acres.	4. Students do all farm work?	5. Projects of school farm.	7. Special work on home farm.	9. Special work with farmers.	10. Features with best results.
Ada	Yes; 4 acres	No	Demonstration: Variety tests of wheat; corn; alfalfa	None, except gardens.	Yes; alfalfa; corn; cow testing.	Alfalfa; cow testing.
Alexandria	Yes; 10 acres	No	Breeding plats for corn; pure seed corn and potatoes; rotations; alfalfa; fruit and orchard; gardens; soil test with fertilizers.	No; but credit is given for work done.	Yes; alfalfa; quack grass eradication.	Alfalfa.
Argyle	Yes; 10 acres	No	Demonstration: Rotation; forage crops; pedigreed seed work.	No	No; will push clubs and pure seed associations.	
Atwater	Yes; 2 acres	No	Demonstration: Corn; mangels; potatoes; peas; alfalfa; sorghum, cultivation experiment.	No	Yes; eradication of weeds; alfalfa; rotations.	Corn work; cow testing.
Bagley	Yes; 28 acres	No	Demonstration: Land clearing; drainage; variety of work with grains; grasses and potatoes; beans; corn; school gardens (28).	No; urged to plant corn and alfalfa.	Yes; alfalfa; pure-bred barley.	Rural meetings in associated schools.
Bemidji	Yes; 10 acres	No	Demonstration: Alfalfa; orcharding and berry plats; two rotations; millet varieties; gardens; fertilizer tests.	Yes; 1 acre of corn for each student.	Yes; potatoes; corn; 50 acres in alfalfa.	Farm a factor through demonstrations.
Bird Island			(New, 1913)			
Blooming Prairie	Yes; 5 acres	No	Demonstration: ear-to-row corn test; gardens	No	None carried out	New man.
Blue Earth	No			No; mostly town boys.	Will do so in 1914.	
Breckenridge	Yes; 2.5 acres	No	Demonstration: Corn; clover; alfalfa	Town boys	Corn contest	Do.
Brooten	No		New department	Believes in credit for work done on farms.		
Buffalo			(New, 1913)			
Caledonia	Yes	Yes	Demonstration: Variety and ear-to-row test with corn; county farm under school supervision; gardens.	Ear-to-row test	Yes; corn; alfalfa	Do.
Canby	Yes; 10 acres	No	Demonstration: Corn breeding and demonstration of methods of sowing alfalfa.	Yes; in corn breeding; yield per acre contests; collecting weed seeds; cow test.	Yes; alfalfa (100 fields).	Seed-corn campaign; acre growing contest; tomato contest (girls); alfalfa.
Carlton	Yes; ¼ acre	Yes	New this year; will have demonstration plots of potatoes; corn; tomatoes.	Corn; potatoes; tomatoes.		Helped with potato diseases.
Cass Lake	Yes; 1½ acres	Yes	Demonstration: clearing land	Potato contest next year.	New this year	
Chatfield	No			Most are city boys.		

[1] For questionnaire used, see p. 18.

Reports by Minnesota high schools on use of land in agricultural teaching—Continued.

1. Location.	3. School land? Number of acres.	4. Students do all farm work?	5. Projects of school farm.	7. Special work on home farm.	9. Special work with farmers.	10. Features with best results.
Cloquet	Yes; 10 acres	Not all	Demonstration: Garden contests; alfalfa; corn; small fruits; root crops; quack grass and eradication; variety tests of grasses and grains.	One to date; cow testing.	Beginning with alfalfa and seed potatoes.	Greenhouse work.
Dassel	No.			No.	Yes. Two fertilizer demonstrations.	Boys' corn club; cow testing.
Deer River	Yes; 10 acres	No.	Demonstration: Seed corn; quack grass eradication; alfalfa.	No; credit given for home work.	Yes; seed corn improvement; clover on stump land.	Seed corn improvement.
Dodge Center	No.					
Detroit	Yes; 10 acres	No.	New in 1913. Demonstration: Barley; corn; and alfalfa.	Some select seed corn and plant it.	Yes; alfalfa work. Cow test.	
East Grand Forks						
Elbow Lake	Yes; 2 acres	No.	Demonstration: Alfalfa; seed trials and tests of cultural methods; tests of varieties of clover; barley.	No	Yes; alfalfa; rotations.	Farmers' club meetings.
Elmore	Yes; 6 acres	No.	New department, 1913	Yes; Crop improvement.	Yes; very little yet, but will do corn work.	
Fairbault			New in 1913; will use farmers' land for demonstrations	Will require some work with corn.	Yes; if farmers will.	Thinks school plat fails to accomplish results.
Foston	No.		New in 1913			
Glencoe	Yes; 5 acres	No.	Demonstration: Six-year rotation; alfalfa; garden; corn selection and breeding.	Yes; will feed balanced ration and keep cow's record of production.	Yes; cow test ass'n; alfalfa.	
Graceville	Not yet		Will get land and demonstrate value of manures; rotations; deep plowing; how to maintain productiveness of soil.	Yes; work; selecting seed corn; test; seed; treating seed.	Alfalfa; rotations; live stock.	
Grand Rapids	Yes; 15 acres	No.	No regular plat; seed potatoes; gardens		Seed corn; potatoes.	Cooperative work better than school plats.
Granite Falls	Yes; 5 acres	No.	Demonstration: Alfalfa; corn; potatoes; gardens; drainage; not in good condition.	Not yet	Talk only	New man.
Grove City	No.		Just started; no projects yet	Will organize boys' corn club.	None at present; variety test work in spring.	
Hallock	Yes; 17 acres	No.	New in 1913	No.		
Harmony	No.		do			
Hastings	No.		Will be required later			

Hector	Yes; 10 acres	No	Demonstration: Varieties of small grains; alfalfa; commercial fertilizer tests; corn; breeding; rotations; potatoes; orcharding.	No	Yes; alfalfa; corn; drainage.	Meetings in rural schools.
Herman	No		New in 1913; will have 6 acres in fair grounds	Will be required		
Hinckley	Yes; 13 acres	No	Demonstration: Winter rye, clover, alfalfa, variety test of oats, 6-year rotation, oats and peas for hay, fertilizer experiments.	No; will feed cattle this winter; home projects will be required in alfalfa, corn, and potato work; garden crops by girls.	Yes; cultivation, fertilizers, selection of stock.	Distribution of seed; consultation on farming work.
Howard Lake	Yes; 8 acres	On 1½ acres	Demonstration: Commercial fertilizers, inoculation of soil for beans and peas, variety test of alfalfa, potatoes, and peas, forage crops.	Yes; all short-course boys are in acre-yield contest.	Some alfalfa; cow records.	
Hutchinson	Yes; 5 acres	No	New in 1913; in 1914: Alfalfa; variety tests of wheat, oats, barley, and flax; rotation plots; fertilizer tests; drainage work.	Yes	Yes; alfalfa; pure seed; cow testing work.	Seed work; cow testing.
Jackson	No		Plan to buy 10 acres; will be used for corn and alfalfa plots.		Yes; corn	Farmers' club for selection of seed corn.
Jordan	Yes; 7 acres	No	Demonstration: Rotation systems, alfalfa, corn improvement; potatoes, including variety test, cultivation test, and planting methods; land has been improved; crop returns in 1913 over $200.	Yes; plan not yet worked out.	Yes; corn selection; orchard pruning and spraying; farm planning; selection of stock; seed testing.	Corn; orchard; farm planning.
Kasson	Yes; 7 acres	No	Demonstration: Variety work with grains; alfalfa, forage crops, soil fertility tests, quack grass eradication, drainage, bush fruits.	Individual milk records of cows, and feed records; acre corn work; soil fertility tests.	Not at present	Drainage; cow testing; corn.
Lansboro	Yes; 1 acre		Demonstration: Ear-to-row test of corn; department new in 1913.	Plan to require 1 acre of corn or alfalfa.		
LeRoy	No		New department; no land on account of lack of funds	No	Yes; corn work; testing milk and seeds.	
LeSueur	No		New in August, 1913			
Lewiston			New this year			
Lewiston	No					
Litchfield	Yes; 4 acres	No	Demonstration: Alfalfa, clover, seed corn, ear-to-row; peas and barley for hay.	Plan to give credit for home work.	New	Farmers' clubs; cow testing contests.
Little Falls	Yes; 24 acres	No	Demonstration; Alfalfa plat treated ten ways, pedigreed barley and rye seed raised and sold, corn improvement, potato work; rotations, school farm returns $200 over expenses.	Yes; five raised one acre corn; three ear-to-row tests.	Yes; ten put in alfalfa; seven pedigreed barley; 50 acres alfalfa 1914.	Alfalfa; corn.

Reports by Minnesota high schools on use of land in agricultural teaching—Continued.

1. Location.	3. School land? Number of acres.	4. Students do all farm work?	5. Projects of school farm.	7. Special work on home farm.	9. Special work with farmers.	10. Features with best results.
Long Prairie	Yes; 6 acres	No	Demonstration: Corn testing, garden contest, grading 20 per cent on arrangement, 40 per cent on care, 20 per cent on product, and 20 per cent on report; gardens were at pupils' homes.	Rotations; pedigreed seed corn; herd record.	Corn and grain work; dairy records, farmers club organization work, dairy herd records; alfalfa.	Dairy records; seed corn work.
Lyle	Yes; 6.5 acres	No	New this year; will start fertilizer; potatoes; alfalfa	No	Will start alfalfa; potatoes; sugar beets.	New man.
McIntosh	Yes; 13.5 acres	No	Demonstration: Alfalfa, gardens, rotations, pedigreed seed plats, potatoes, corn improvement.	Yes; testing dairy cows.	Yes; building roads; seed corn selection; growing fodder corn.	Acre corn contest; selecting stock; eradicating weed.
Madison	Yes; 11 acres	No	Demonstration: Corn improvement for 3 years; gardens; variety tests of small grains; alfalfa; potatoes; apple and plum trees.	Yes; acre yield corn work.	Yes; 60 farmers used improved corn raised on school farm; quack grass eradication; alfalfa.	Corn work; corn breeders' association formed.
Mankato	Yes; 5.5 acres	No	Demonstration: Potato work; corn work; alfalfa tests	Home gardens	Yes; corn work; alfalfa; cow testing.	Corn.
Mantorville	Yes; 2 acres	Very little.	Ear-to-row test of corn	Yes; test of cows; record of hens.	Yes; dairying and live stock.	Seed test and improvement.
Maple Lake	Yes; 1 acre	Yes	Demonstration: Gardens; new department	Will be required	No	
Maseppa	None		None	Garden vegetables.		
Minneota	No		New in 1913; home farms instead of school farm	Acre corn work; gardening; tomato growing for girls.	Yes; not enumerated.	Alfalfa; rotation.
Montgomery	No		No school plat; farmers' own farms used; home gardens only and vacant lots; new department in 1913.			
Monticello	None		Plats used on farms in cooperation with farmers. (Gave up plats at school; this is preferable.)		General extension work.	Cow testing.
Mora	Yes; 4 acres	No	Demonstration: Garden; corn-improvement work	No	No projects; talks only.	First year in work.
Morgan	No		None	Testing cows		New man.
Mountain Lake			New; 10-acre farm expected		Will pick seed corn and later test the seed.	

New London	Yes; 8 acres	No	4 acres cleared; rest is in young timber	Short course; boys will sow an acre of alfalfa or clover.	Alfalfa; orchard	Alfalfa.
Northfield	Yes; 5 acres	No	Demonstration: Seed grain and corn improvement; alfalfa; weed eradication; use of fertilizer; potatoes.	Optional	Yes; alfalfa; corn work; rotations; milk testing.	Corn; school plat deemed a nuisance; many lines of extension work.
Norwood - Young America.	Yes; 4 acres	No	Demonstration: Corn, alfalfa, vegetables	No	Yes; alfalfa plats; fertilizer on peat.	Peat work not satisfactory.
Olivia	Yes; 15 acres	No	Demonstration: Variety test of corn, potatoes, cabbage, and tomatoes; alfalfa.	No; sweet corn and corn plats sublet to students.	No	
Owatonna	Yes; 14 acres	No	Demonstration: Rotation of crops; testing of alfalfa, sweet clover, and varieties of grains; garden; drainage; soil moisture tests; seed corn work; fertilizer tests.	Will be required; acre corn contest; seed corn selection.	Yes; soil acidity tests; seed corn work; alfalfa.	Uses automobile in outside work; dairy test work.
Park Rapids	No				Yes; crop rotation; alfalfa; potato spraying.	
Pine Island	Yes; 4.5 acres	No	Demonstration: Alfalfa; corn, ear-to-row test; garden; alsike clover.	No; corn or alfalfa.	Yes; alfalfa; corn.	
Pipestone	Yes; 8 acres	No	Demonstration: Alfalfa; grasses; corn, ear-to-row test; peas; sorghum; eradication of quack grass; beans. (Difficult to conduct demonstrations of value to farmers using hand-work methods. Still believer in school plats.) Alfalfa field on county fair grounds.	No; many are from city.	Yes; corn; alfalfa	Good corn.
Plainview	No		No projects yet; will put in some alfalfa and seed-corn plats for farmers.			
Preston			Will have 5 acres at fair grounds this summer			
Red Lake Falls	Yes; 10 acres	No	Demonstration: Eradication of weeds	No	Yes; corn	Corn.
Red Wing	Yes; 7 acres	No	Demonstration: Corn; rotation; gardens; nursery; orchard; alfalfa.	No	No	New man.
Renville	Yes; 5 acres	No	Demonstration: Alfalfa; corn; small grains. (Have given up school farm for next year, as each farmer's farm is a problem and that is the place to work it out.)	No; corn and potato projects.	Yes; alfalfa (6); corn (2); deep tillage and fertilizer; many other kinds of work.	
Rochester	Yes; 12 acres	Most of it; student labor paid.	Demonstration: Corn; alfalfa; ear-to-row tests; potato varieties; rotation; fertilizer test on small grain plats.	Yes; corn; alfalfa	Yes; corn; alfalfa	Corn; alfalfa.
Royalton	Yes; 5 acres	No	Demonstration: Alfalfa; rotation; variety tests of corn, wheat, and barley; method of cultivation and spraying potatoes; use of commercial fertilizer; peas.	Yes; acre yield corn work.	Yes; alfalfa corn	Cow testing; corn; alfalfa.
Rush City	Yes; 2 acres	Nearly all.	Demonstration: Alfalfa; corn breeding; use of fertilizer with corn and potatoes; gardens.	Yes; corn; potatoes-spraying work.	Yes; alfalfa; clubs; cow testing; selection of seed potatoes.	Cow records; seed corn work; and alfalfa.

Reports by Minnesota high schools on use of land in agricultural teaching—Continued.

1. Location.	3. School land? Number of acres.	4. Students do all farm work?	5. Projects of school farm.	7. Special work on home farm.	9. Special work with farmers.	10. Features with best results.
Rushford	None					
St. James	Yes; 5 acres	No	Demonstration: Alfalfa, corn, potatoes.	Not required; corn breeding, cattle feeding, alfalfa.	Yes; alfalfa, seed grain, cow testing.	Many disadvantages, with few if any advantages.
St. Peter	No				Yes; fertilizer tests; variety tests; seeding alfalfa.	Best returns in using farmers' and pupils' land.
Sandstone	Yes; 14 acres	No	Demonstration: Corn; potatoes; new department	No		
Sauk Center	Yes; 10 acres	No	Demonstration: Varieties of corn; variety test of potatoes; garden; quack-grass eradication.	City boys	Yes; alfalfa; corn	Cooperative shipping; farmers' clubs; live stock.
Sauk Rapids	No		New department	No		New man.
Shakopee	Yes; ¾ acre	No	Demonstration: Fertilizer experiments; improvement of corn and potatoes; testing forage crops; school gardens. No permanent ones.	Very few pupils from country; supplied seed and fertilizer.	Yes; seed corn; best barley; fertilizer experiment.	Difficult to get accurate returns.
Sherburne	Yes; ½ acre	No	Demonstration: 3 plats of alfalfa	No; will next year.	Yes; corn, drainage, clover.	Feeding dairy cows; selection of seed corn.
Slayton	Yes; 3 acres	Yes	Demonstration: Tomatoes, corn, alfalfa	Yes; home gardens; optional.	No; conference only; alfalfa.	New man.
Spring Valley	Yes; 16.5 acres	No	Demonstration: Corn breeding; small grain breeding; alfalfa; commercial fertilizers; general farm plan.	Yes; corn; alfalfa; rotation farming.	Yes; corn; alfalfa; rotation farming.	Corn.
Stephen	Yes; 27 acres	No	Demonstration: Systematic rotation; school garden; seed corn; winter wheat; alfalfa.	No	Potato contest	
Stewartville	No			Credit for work in acre contests under consideration.	Yes; alfalfa	New man.
Tracy	No		None	Will give credit for home work this spring.	Spends one-half day with farmers on pure-seed corn; alfalfa; live stock.	New man.
Two Harbors	Yes; 1½ acres	Nearly all.	Demonstration: Potatoes, alfalfa, buckwheat, cabbage, flax, barley, peas, beans; gardens.		Yes; testing soil for acidity; clover seed; alfalfa; corn.	
Wadena			No department			
Walker	Yes; ½ acre		New department			

Warren	Yes; 12 acres	No	Demonstration: Corn, grasses, alfalfa, flax; rotation gardens.	Yes; school gardens; 10 one-acre corn.	Yes; pure seed; seed test.	Garden, acre corn contest pure seed.
Waseca	No		None		Yes; plan rotations; fertilizers; eradication of Canada thistle and quack grass; selected seed corn.	Extension work.
Wayzata	No		Demonstration: Variety tests of vegetables, bush fruits; test on pruning of bush fruit; small orchard. New department.	Hope work can be required.	Demonstration: Orchard.	Nothing new, Aug. 1.
Wells	Yes; 20 acres	No	Demonstration: Corn breeding	Required to plan father's farm; involve stock; alfalfa; corn.	Not yet	New.
Westbrook	Yes; 6½ acres	No	Demonstration: Variety test of wheat, oats, barley, flax; clover in 5-year rotation; alfalfa; corn-breeding plot; fertilizers on corn; variety test of potatoes.	No	No; no cooperation yet.	Clover in crop rotation.
Willmar	Yes; 20 acres	No	Demonstration: Drainage; rotations; corn improvement; alfalfa; barley; orchard and garden.	No	Yes; corn; alfalfa; corn and grain improvement; drainage.	Corn and alfalfa; potatoes; cabbage; onions.
Windom	No			School garden	Yes; alfalfa; quack grass.	Dairy work; better seed; no desire to have school farm.
Winnebago	None					
Winthrop	Yes; 4 acres	Yes	Demonstration: Gardens; corn; ear-to-row test	No; acre corn contest encouraged.	No; plan to carry on work in alfalfa; corn; potatoes.	

III. IN PREPARING TEACHERS OF AGRICULTURE SHOULD THE AGRICULTURAL COLLEGE GIVE A SPECIAL FOUR-YEAR COURSE BY SPECIAL INSTRUCTORS, OR ADD AN ELECTIVE OF ONE YEAR OF PEDAGOGICS AND PRACTICE TEACHING TO THE REGULAR AGRICULTURAL COURSE?

By A. V. STORM, St. Paul, Minn.

In the preparation of the teacher of agriculture, which is paramount, our duty to the State or to the individual? If the former, shall we prepare him to meet conditions as they are in the immediate Commonwealth, or in the State in the broad Federal sense? Shall the agricultural college prepare teachers for rural elementary schools, town elementary schools, public local high schools, special secondary schools, colleges, and normal schools, or for agricultural colleges? What other classes of persons besides teachers are the agricultural colleges educating? Is the agricultural knowledge needed by the teachers different from that needed by these other classes of students? If different, is the difference fundamental or only incidental? Is this difference any greater between the prospective teacher and the other classes of students than among these other classes themselves? Can not the special needs of the teacher be fully met by courses dealing with other things than the gaining of scientific agricultural knowledge? If so, of what shall these special courses consist?

Whether the collective answers from workers in different States would in any measure result in a consensus of opinion, or in a mere census of opinion, would depend largely on the answers to the question first asked, Are the interests of the individual or of the State paramount in the preparation of teachers of agriculture? The relative importance of the individualistic and of the sociological interest in education is undetermined at present. The right of the individual to an education for his own sake, even at public expense, is a concomitant of the development of the various other personal rights which has marked recent generations. The sociological conception of education is more recent than the individualistic conception, but it is growing very rapidly. If you were asked whether public education were maintained for the individual or for the State you would answer "For both," and so would I. However, there is much evidence that legislative appropriations and payment of taxes toward maintenance of higher institutions of learning are dominated largely by the idea that they are for the purpose of improving the social and economic conditions of the State rather than for the purpose of giving opportunity to the individual. For example, some States have a provision that teachers prepared in State normal schools must agree

to teach in the public schools of that State for a certain number of years after completing the normal school course. Again, the universal reason advanced for more and better normal schools is the need of the State for teachers, and not the need of the teacher for an opportunity to prepare to teach that she may go to some other Commonwealth. Is this not in a measure the situation in which the State colleges of agriculture find themselves, save that Federal aid may give some sanction to the broadening of the geographical confines of the demand?

To some this controversy may seem remote and far afield, but to me it is imminent, and on its determination depends partly the final reply to the original question. If you lean toward the individualistic view, you will plan such a preparation for your student as will best fit him for the highest service, recompense, and chance of promotion to be found anywhwere. If all took this attitude we could consult together, determine where the best field for these men lies, what the demands of that field are, what sort of preparation the men need to meet that demand, and how college courses should be organized to give that preparation. On the contrary, if you are inclined toward the sociological view of education and believe that the business of the department of agricultural education in your State college of agriculture is to prepare teachers to meet the needs of your particular State, you will so plan your courses as to give that preparation in the best manner, regardless of the purpose of preparing the individual for the best possible opportunity for himself.

"But," you say, "I believe in both views, and want to prepare my men both for local needs and to meet their own best opportunities." A very patriotic, altruistic, and altogether praiseworthy ambition, and happy is he who is so situated as to be able to satisfy it; but in addition to patriotic and altruistic intentions it takes a higher degree of equestrian ability than most of us possess to ride at the same time on two horses moving in exactly opposite directions. Let me illustrate. In State A the demand is for agricultural college graduates capable of teaching a full four-year course in the high school and of directing and advising the farmers and business men of the community. Half of each school day and all of the school vacation time are free for community work. The service of the agricultural teacher is for the full year with certain specific short vacations. The building has specially equipped rooms for his work. He may have a plat of ground to use for educational purposes. He is not to teach anything but agriculture, unless it be one related subject, such as botany, and then only by special permission of State authorities. His recompense is from $1,200 to $2,000 per year. There are 140 such positions in the State. If he succeeds, his chances are good for promotion to one of the other 140 schools, or to a position in one of the

special State secondary agricultural schools, or to a county agricultural agency in the same State at from $1,800 to $2,400 salary. In State Z the visible demand is for one who can teach a half year of agriculture and spend all the remainder of his time teaching other studies with no community work to do. The period of service is nine months. The pay is from $450 to $675. The chance for promotion in agriculture is very small. He or she is in competition with other high-school teachers, who are numerous enough to keep vacancies few and salaries low, and there are no roads leading anywhere else. If these two sets of conditions are typical, you can readily see that to meet the State need may or may not be the same as opening the largest opportunity to the individual. In State A the State's need promotes in the highest degree the individual's opportunity. This enlarged opportunity warrants a complete and thorough preparation. In State Z the State's need calls for a sacrifice of the individual's agricultural opportunity. This sacrifice in opportunity calls for a corresponding sacrifice in preparation in agriculture.

On this basis of need and opportunity we might use up the remainder of the alphabet in classifying the various States, but for the purpose of answering the original question propounded by your program makers I wish to divide the States into the two classes typified by the foregoing illustrations. In class A I wish to put all those States that approximate the conditions set forth under State A above; that is, States that not only demand men thoroughly prepared in agriculture, but that are willing and able to reward properly those so prepared. I also wish to put in class A any other States not so situated but whose college of agriculture believes in preparing the students for the best positions open to them anywhere, regardless of the demand in its own State (though I do not care to share the responsibility for such a decision).

In class Z I wish to place all of those States in which the demands and rewards are not sufficient to warrant the prospective teacher in making thorough preparation in agriculture, but do call for teachers with a limited preparation in agriculture and a more complete preparation in other branches, and who feel that it is their duty to confine themselves to preparing teachers for their own State. Even at the risk of being considered opinionated and perhaps perverse, I must say frankly that neither for class A nor class Z conditions would I be in favor of approving unqualifiedly either alternative of the committee's topic as I understand it, for reasons which I will try to make clear.

The State colleges of agriculture should recognize it as their duty to prepare teachers of agriculture who are to serve in public high schools, special secondary agricultural schools, normal schools, colleges, and agricultural colleges, leaving to the normal schools the

preparation of elementary and rural teachers. The agricultural knowledge needed by the teacher of agriculture in secondary schools, normal schools, and colleges is not different in kind from that needed by other students in the college of agriculture. The difference between the preparation of the agricultural college students who are going to teach and those who are going into farming or into research is no greater than the difference between the preparation of the one who is going into farming and the one who is going into research. The prospective teacher of agriculture should take the fundamental courses of all agricultural departments of the college, taking, however, more courses in the more comprehensive and important departments, such as agronomy and animal husbandry, than in the less comprehensive ones. This work should be taken (except as explained below) in the regular college courses with the other agricultural students and under the regular agricultural instructor. The prospective teacher needs the knowledge of agronomy as presented by scientific agronomists, the knowledge of animal husbandry as presented by scientific animal husbandrymen, and so on through the other courses. Only a specialist can give him the quantity and quality of scientific knowledge in each of those fields necessary to his success.

There are, however, three serious objections to this plan. First, the college teacher of agronomy or animal husbandry or other subject may present his work in a very unpedagogic manner, a manner inimical to the proper progress of a college student, but trebly so to the progress of an adolescent high-school student, if those methods should be copied by our prospective teacher. Second, the extent of treatment of a subject in the college course may be entirely unwarranted in the presentation of the same subject in the high school. Third, the subject matter contained in the many highly differentiated courses of a college department must in the high school be combined into one course to be given in one school year. This presents to us a dilemma. Our prospective teacher needs a broad, deep, and scientific knowledge of subject matter, but the form, sequence, and proportions in which he receives it are not adapted to the circumstances under which he is to teach it. What shall be done? To meet the lack of pedagogical presentation on the part of the college instructor, we can substitute one who knows both subject matter and pedagogy, but there are not enough such to go around. We might substitute one who knows much pedagogy and little scientific agricultural subject matter, but it would probably be easier to correct the pedagogic shortcomings of the scientist than the scientific deficiencies of the pedagogist.

The disproportion of treatment and the wide differentiation of courses could be overcome by giving to the prospective teacher the

identical course in college that we expect him to teach in the high school, but this would so limit and circumscribe his knowledge of subject matter as to give him ill preparation for his work, since every teacher should know far more about each phase of his subject than he is expected to teach. In making our choice of difficulties, we need not necessarily choose the one containing the lesser evils, but rather the one whose evils are most easily remedied by the means at our command. We had better face the evils of the regular college course taught by regular agricultural instructors, with the possibility of correcting deficiencies, than risk the defects of the specially prepared courses with little or no opportunity to remedy them.

In lieu of the technical courses in some particular department of agriculture taken by other students, the prospective teacher should take pedagogical work to the extent of not more than one-eighth of his college course.

The department of agricultural education is specifically charged with the duty of giving to the prospective teacher, in addition to what he receives in the regular classes in agriculture and kindred subjects, this work which he needs for teaching as distinguished from what he might need if he were to go into any other field of agricultural activity, such as farming or research. The work that ought to be done by this department is comprehended in four general divisions: First, the knowledge of the underlying principles of education and consequently of teaching, which includes knowledge of the human mind. Second, the organization of agricultural subject matter to be taught in accordance with these principles, which includes the amount, selection, sequence, arrangement, and units to fit the conditions of the particular type of school in which the teaching is to be done. Third, an understanding of the principles, processes, and practices to be followed in the presentation of this subject matter through the classroom, the laboratory, the school plat, and the community work. Fourth, actual practice in teaching this subject matter in this manner.

Proper pursuit of this plan will give the prospective teacher his agricultural subject matter by a specialist and from the agricultural point of view and will give him his pedagogy by an equally scientific specialist from the instructional point of view, with the content of the former thoroughly organized in harmony with the principles of the latter.

But have we been pursuing this plan properly? Applying the child's interpretation of Scripture, have we not seen the agricultural "oat" that is in our neighbor's eye and failed to see the pedagogic "bean" that is in our own eye? Have we been satisfied to give the embryonic teacher a little fossilized history of education, a little petrified psychology, and perhaps a small portion of dessicated methods, hoping that by some sort of mental legerdemain and without further

human assistance the man with agricultural knowledge will be transformed into a properly equipped and efficient teacher?

When the departments of agricultural education bear successfully their full responsibility in the four divisions of activity enumerated above, not only will the objections to teachers taking their agriculture in the regular courses be reduced to the minimum, but the departments of agricultural education will find tasks worthy of their best endeavors for many years to come.

But if the general plan of having prospective teachers take their agricultural work in the regular courses is adopted, some changes should be made in present conditions. Presidents, deans, and heads of departments, in engaging and retaining instructors, should give the greater consideration to pedagogical efficiency in candidates, instead of relying almost wholly upon a knowledge of the subject matter.

Some departments should regroup some of the material in their courses to enable not only prospective teachers but prospective farmers and scientists to get what they need without taking so much that they do not need. The water should be squeezed out of some of the courses, so that time will not be wasted in taking useless material simply that the course may occupy a certain number of semester hours.

In certain instances where the number of prospective teachers is large enough to constitute a class, a new course might be formed combining the essentials of two or more other courses. This new course should be formulated by the professor of agricultural education and the head of the particular agricultural department, but should be taught by the agricultural specialist.

Experienced teachers taking agricultural courses might, if in sufficient numbers, be grouped together and allowed to take given courses in much less time than that occupied by undergraduates, as they would be abundantly able to do, and thus increase the preparation they would receive in the time spent. Eventually, professors of agricultural education should be graduates of normal schools or colleges of education, and also of agricultural colleges, with teaching experience in both public school and college.

Heads of agricultural departments should realize the value of close cooperation with these agricultural education instructors, not only in the organization of courses, but in conducting the class work in their several departments. Opportunities for practice teaching must be provided, even though the difficulties and expense are great.

History of education and psychology should be made vital and pertinent and should lead directly to the solution of present industrial education problems, or should be abandoned altogether.

Institutions in which this work is given by the regular normal or university instructors unfamiliar with the problems of agricultural

teaching need special attention in this regard. The work in methods and practice teaching needs to be specially directed toward proficiency in agricultural instruction. Professional preparation that is limited to the selection in a college of education of certain courses not specially intended for those who are to teach agriculture, will not meet the situation; and although cooperation between coordinate colleges or departments of an educational institution is highly desirable, unless the department, school, or college of education is prepared to give the professional courses in a manner adapted to the needs of the agricultural teacher unhampered by the extreme conservatism which often marks such courses, the college, division, or department of agriculture must make provision to have these courses given in some other way.

Under class Z conditions in which the demand and rewards will not warrant a full four-year preparation, would be found, if anywhere, the justification for giving the agricultural preparation in special courses—unless by special course we mean a course in miscellaneous agriculture taught by one who is fundamentally a pedagogist and also incidentally an agriculturist, in which case I doubt the value of such a course anywhere in the college of agriculture.

If the time of the prospective teacher is limited, it would be much better to have him take a few of the most fundamental courses in the various departments, or to arrange some composite courses by combining the most important parts of present courses, having each agricultural instructor teach his portion of the composite course. Or, perhaps, a better plan would be to combine these two plans. Whatever is done, the professor of agricultural education should prepare the prospective teacher to use the material in the particular kind of school he is to serve.

The same plan should be followed in summer sessions, where men are being prepared as principals of consolidated schools in rural communities, or to teach brief courses of agriculture in public high or graded schools. That is, they should take some of the fundamental regular college courses, such as those in agronomy, animal husbandry; and they should also follow composite courses made of work in the less comprehensive subjects, the composite courses to be taught by the regular agricultural instructors, just as the other courses.

Briefly summarized, then, my reply to the inquiry of the program question is:

In institutions where thorough preparation of teachers of agriculture is the aim, most of the agricultural work should be taken in the regular courses, though by cooperation between the agricultural and the pedagogy teachers a few special courses might be arranged, but even these should be taught by the agricultural specialist.

The professional work should not be confined to one year, but should be extended through the last two years, with the privilege of taking some of it in the second year, if the student desired. This professional work must include, among other things, proper organization of the agricultural material into teachable form, and practice teaching of it in that form. In institutions where only limited preparation can be made, either in summer session or in regular term, a few of the most essential regular courses should be taken, but a larger number of specially arranged courses would be permissible here than under more favorable circumstances. These should be composite courses arranged cooperatively by the department of agricultural education and the particular agricultural department or departments concerned, but should be taught by the agricultural specialist. The department of agricultural education should give professional courses that include, among other things, the proper organization of the agricultural material, and practice in teaching the material so organized.

DISCUSSION.

By G. A. BRICKER, College of Education, Ohio State University.

The statement of the topic for discussion seems to impose unnecessary limitations in that it assumes that there may be only two alternatives, namely, (1) either a special four-year course, or (2) a one-year course of pedagogics and practice teaching in addition to the regular agricultural course. In other words, it assumes that if the addition of one year of pedagogics and practice teaching to the regular agricultural college course is not sufficient to meet the needs of the teachers of agriculture in training, then it will be necessary to establish an independent and special four-year course for this purpose, the same to be administered by a special corps of instructors. If this statement is correct, then this discussion begs leave to differ with both views.

As the speaker sees it, there are four factors that influence the organization of courses in agricultural teaching: (1) The technical, (2) the professional, (3) the general training courses that are more or less contributory to the efficiency of the agricultural teacher, and (4) the administrative, including economy.

TECHNICAL TRAINING.

The extent of the technical training that teachers of agriculture may be expected to attain will depend upon the kind of school in which the teacher in training intends to teach, whether in an elementary school, a general high school, a normal school, a general college, an agricultural high school, or an agricultural college. As a general principle, it may be stated that the technical training of these various teachers should be the same in the beginning and should become cumulative in the order of the foregoing list of schools.

Teachers of elementary agriculture, and all other grades of teachers of agriculture, should have a general telescopic view of the fundamentals of agricultural science and practice. This does not imply the institution of an exploitative course, but a grounding in the fundamentals of the subject by the use of typical concrete materials necessary for definite and adequate illustration and practice, with all nonessentials for

the actual and immediate needs of these teachers left out. Laboratory and field work, including the organizing and operating of demonstrative field and home projects, should be provided for. A course of this character would give a proper perspective of the various departments of agricultural science and art and would constitute an indispensable basis for the special application of the principles of pedagogy to agricultural teaching, besides making an excellent foundation upon which to build a specialized study in any of the various departments of agriculture. The acquisition of this training should be accomplished by the average student by pursuing a course in the elements of general agriculture, which should represent one-fourth of one year's study.

Such a course of technical agriculture as is outlined in the preceding paragraph is judged sufficient also for the teachers in the general nontechnical high schools in which only half-year or one-year courses are offered.

Teachers for general departments of agriculture in normal schools, general nontechnical colleges, and agricultural high schools not organized on the departmental plan should, in addition to the foregoing, pursue the introductory, fundamental courses in each of the departments usually found in the agricultural colleges, which should form a total of about one and one-half years' work.

Teachers preparing to teach in the technical agricultural high schools organized on the departmental plan and in agricultural colleges should pursue specialized studies in those particular departments in which they expect to become teachers an additional period representing an additional half year and one full year, respectively.

PROFESSIONAL TRAINING.

The general professional training of all teachers of agriculture should be much the same and should consist of one-half year to one year's course in educational psychology, and at least one-half year in general methods. The special training will be determined by the kind of school in which the teacher in training expects to serve. There should be at least one-half year in special methods for all teachers in the teaching of elementary agriculture for the teachers in the elementary school, and in the teaching of high-school agriculture for the teachers in the secondary schools. Each of these courses should include about half time practice in teaching in appropriate rural schools.

If the student is to become a teacher in a normal school or in a department of some other higher institution, where superintendents and supervisors are to be trained, there should be required at least a half-year course in the administration of agricultural teaching in addition to the strictly pedagogical requirements.

GENERAL TRAINING.

The training of teachers of agriculture may not properly be limited to the technical subjects. There are other subjects, not strictly agricultural, that contribute to the efficiency of agricultural teaching. These subjects are botany, zoology, geology, physics, chemistry, rural economics, and rural sociology. These last two subjects are mentioned in order that their importance in the training of teachers may not be overlooked. Teachers for the high schools, the normal schools, and the colleges of whatever type should at least pursue the general college course in these subjects. These nontechnical but contributory subjects will represent about one year's study.

ADMINISTRATION.

The administrative factor of the college can not be overlooked. Administration courses are offered in the regular agricultural college curriculum, and will be pursued under the professors and in the departments offering them. Nothing additional will be needed for them. If there are schools of education in the same institution, the strictly educational work may be similarly disposed of.

The program of studies above outlined is one which very few, if any, of our agricultural colleges catalogue in its entirety. Since these courses are not all offered, this discussion contends that there should be a distinct department to offer these subjects for the training of teachers that may not well be included in departments already established. On the other hand, there is need for the unification and classification of the very diverse materials into workable systems—not for farm practice—but for teaching purposes. Because there is a difference of aims in the training of farmers and of teachers, there must be a difference in the courses for the attainment of these aims. The divergence of the courses to be traversed by these two classes will be in ratio to the relative divergency of the ends in view. The curriculum for the agricultural teacher is a sort of shunt from the main line after having traveled with it during a large part of its course, and after separation it still runs parallel.

It means exactly this: That there is a difference in farmer training and in teacher training; that to attain the greatest efficiency in the teaching of agriculture this difference must be recognized and provided for; that there must be departments in our agricultural colleges in charge of specialists of agricultural teaching; that these departments shall avail themselves of all courses possible for them to use in the training of the various grades of agricultural teachers and supervisors of agricultural teaching; that they shall institute and offer new or special courses needed; and that this will mean a distinct program of subjects, but not wholly a new set of courses. To administer this special training there will be need of one or more members of the faculty according to the extent and degree of efficiency to which the work of teacher training is carried and the encouragement that this new department of agricultural teaching receives.

IV. HOW SHALL THE AGRICULTURAL COLLEGE PREPARE EXTENSION AND FIELD MEN?

By C. H. Tuck, Cornell University, Ithaca, N. Y.

In the first place the question should be raised, Can the college train extension and field men? The answer in my judgment is, To a very limited extent. No kind of formal training will ever do much, but the college can do a little.

We may divide extension men into two classes, general extension men and field men. The general man has to do with administration. He rarely touches subject matter. His work is with people and affairs. He must harmonize where discord is probable. He must secure efficiency where inefficiency is likely to occur. He must have a rare combination of tact, good judgment, human understanding, and capacity to do, which are found here and there among the men of agricultural colleges. You know the man. He is a subject about whom little more may be said.

Considerably more can be said about the field man. First of all he must have knowledge of his subject. No suspicion of uncertainty can be allowed. While an undergraduate he will have specialized along his "particular line." His department will know him. He must want to carry his information to the people; in other words, he must want to be a teacher, for an extension teacher must be just as truly a teacher as one in the formal classroom. He should have farm experience, and plenty of it. Preferably, he should have been

reared on a farm. It takes but a short time for the farmer to see the lack of experience of the man from the city. He must be adaptable, for he will meet many varied conditions. Quick changes must be made to bring teacher and pupils to a common basis of understanding. He must be patient, never growing weary of the apparent lack of interest, slowness, and even ignorance of his pupils. He should be robust, so that he may stand up under the work, withstand the rigors of winter or the heat of summer. In short, he must be a man.

One reason which led the committee to place me on the program was that we have an extension course at Cornell University. I shrink from giving personal experiences, but your president has told me that you wanted not so much theories as practices. Theories are at hand to justify almost any practice.

Some six years ago Director Bailey asked us to give a course in "neighborhood extension." This contemplated a systematic oversight over the occasional extension trips our boys were taking into the neighborhood adjoining the university. The course was started to give a little organized drill in selection of suitable subjects and in their proper presentation. The registration was at once encouraging. From year to year the course grew and changed until it is to-day a course in "self-expression" by means of oral and written forms, demonstration material, lantern illustrations, parliamentary drill, and extension methods.

Our experience has taught us that most undergraduates are quite incompetent to analyze their thoughts and to express themselves in language that will accurately and effectively transmit their ideas to others. Only upper classmen are admitted to the course. Each has to select from time to time a subject that has a real meaning to him. This often is the first stumbling block. Some students have no subject that means much to them. Three appointments of 20 to 30 minutes each with a competent instructor are arranged so that the outline, subject matter, diction, and delivery may be as acceptable as the student's capacity will permit. Students are taught the sin of wasting the time of an audience through lack of careful preparation. The speeches are criticized by the class, which is divided into sections of twenty-five to thirty. There are about 125 men in the course.

A large range of subjects prevails—anything of sound merit relating to agriculture. A competition for a prize of $100 takes place each year during farmers' week, when the students have a real audience. The course gives two hours' university credit throughout the year.

Actual practice work in conducting a meeting with necessary parliamentary drill is given toward the end of the course. Occasionally promising students are given a chance to do outside work.

The study of extension problems comes mainly in a seminar of one hour, of which at present about 25 upper classmen are members. Each selects a special problem—extension work in plant pathology for example—and makes a thorough investigation of subject matter, methods, and localities concerned with the subject. Reports are made in class for general discussion and criticism. In this way each becomes thoroughly familiar with some important branch of investigation and makes this knowledge of service to his classmates, to the end that all may know college extension, that each may be strengthened in effective self-expression, and that the college may the better "discover" those with natural gifts improved through training for the field of extension service.

V. THE SCOPE AND PURPOSE OF AGRICULTURE IN SECONDARY SCHOOLS.

By H. M. Looms, Director Smith's Agricultural School, Northampton, Mass.

We are in a condition of social unrest and dissatisfaction that takes the form of a critical inspection of results for the purpose discovering two things regarding the production of social utilities: First, to see whether results directly follow the expended efforts; and, second, whether the results are fairly proportionate to the expended efforts. It is a kind of social inventory we are taking, and public education has not been overlooked. The consensus of opinion is that a considerable portion of the money spent in public education produces distressingly small returns. Consequently we are casting about to see if new subjects or new methods of handling old subjects will not increase the educational returns.

This is not a new experience in American education, nor is this the first time that agriculture has been chosen as a possible cure for certain ills. Back in the second quarter of the last century agriculture was introduced into secondary education. There was a firm belief at that time on the part of a few that much assistance could be rendered New England agriculture by the study of the chemistry of the soil, the different methods of tillage, and related topics. The teaching of the subject, however, was given up after a short period, and we can point to little or no direct result. Again, at the beginning of this century educational unrest has resulted in the reintroduction of agriculture into education and in constructive legislation concerning agricultural instruction. The reason given this time why educational agencies of a new type are needed is that the public schools are doing little that directly promotes skill in production. Commendable progress, it is admitted, has been made in the teaching of the three R's and in the taking over of large and valuable portions of the fine arts and social refinements. It is pointed out,

however, that our public schools neglect to teach their pupils how to do their daily work with any larger returns, with greater ease, or with increased satisfaction.

When we turn to the discussion of the purpose of agriculture in secondary education, we immediately recognize that certain subjects are taught from different and somewhat contrasted needs. At least, the resulting abilities of those taking such subjects under different standards of attainment often stand in striking contrast. It is not a new idea in educational discussion that some students pursue a subject for the purpose of extending their mental horizon, for information and sympathy, and that others study the same subject for aid in their occupations. It has become a practice in many of our best American universities to differentiate the chemistry for medical students from that studied by those who take chemistry as a part of their academic education. The same distinction has been worked out in the subject of mathematics, as the terms "pure" and "applied" indicate. This principle of dominance of needs has not been so influential in shaping the character of work in secondary education, yet the principle is recognized. The general student takes physiography; the commercially minded student studies commercial geography. Students not preparing for college are provided in some secondary schools with physics of a less technical and mathematical character and of a more practical sort. The study of secondary agriculture primarily for intellectual outlook or primarily for working efficiency is without doubt a settled distinction. Like all generalizations, it affords a fair field for quibbles and dialectics. The distinction is nevertheless important to keep before us, at any rate during the present experimental stages of this subject in secondary schools.

Many persons of general scientific training can be trusted to teach secondary agriculture when the dominant purpose of its study is intellectual outlook and sympathetic appreciation of the soil. If, however, the main purpose is to train successful and efficient producers of farm products, we must look to an entirely different type of preparation.

We have reasons for believing that elementary agriculture is capable of occupying a high place as a subject of culture. It possesses all the points of excellence commonly recognized as applying to physical geography, and it offers in addition an introduction to the social and economic sciences. A poet once said: The proper study of mankind is man. Fully as pertinent would it be for us to say that the proper introduction to the sciences is the study of elementary agriculture. It is hardly possible to present it without making it introductory to the physical, biological, and social sciences. It can be put on both the laboratory and the topical-library methods of

study. It can be made both inductive and deductive. It is a fair field for all excellencies in teaching methods.

But that other type of agriculture—the type that emphasizes work rather than words; that demands that the pupil must know how after having been taught how; that measures results in bushels and pounds rather than in marks and percentages—that type upon which the indefinite something called "culture" follows, not because it is sought, but because culture is an inevitable concomitant of all lines of endeavor which culminate in finished products—what is the field of this type of agriculture in secondary schools and what are to be its results?

It is only fair to ourselves and just to the movement to admit frankly that we are feeling our way in the matter of teaching productive agriculture as a school subject. That we are to succeed there is little reason to doubt. City life and country life in America equally demand that the movement shall succeed. Unfortunately we can not turn to the agricultural colleges as teaching models in training for productive agriculture. The agricultural colleges appear to be in that stage in teaching productive agriculture through which the medical schools passed several decades ago in training practicing physicians. They teach the science and theory of agriculture, but not the art. Some agricultural college speakers and writers say that training in productive agriculture is not the work of the college. One can only reply that such was the argument of the medical school at one time regarding preparation for the care and healing of the sick.

It must be admitted, however, that at present the incubator does not hatch with any more certainty for the agricultural college graduate than for the academic college graduate. A young agricultural college graduate is liable to make the same series of mistakes in starting a fruit plantation that any other beginner makes; and so on through the whole range of productive farming.

One of our besetting sins in teaching this new type of agriculture is the temptation to work the thing out on paper in ideal terms, after the style employed in cultural education, forgetting that in productive agriculture, at least, nothing is true until it finds concrete expression in the farm life of the boy. Everywhere more or less elaborate paper plans exist for the teaching of productive agriculture. To the question which is the best method, the reply seems to be that it is altogether too early yet to decide. Success, moderate success, and flat failure have resulted in all of the methods. Good teaching is never at bottom a scheme or device. It is rather the getting something done through personal contact. This statement is far from implying that methods and systems are useless. The remarkable results obtained in the beginnings of elementary education are to a large extent the products of schemes and devices; but

it must be remembered that schemes and devices are less and less effective with advancing grades. In the case of adolescent youth, where individuality is in ferment, methods are less successful, and resourcefulness and teaching skill on the part of the instructor are of most value.

It is not difficult in the history of education to find remarkable teaching schemes discarded after a few years. Some of us can recall sloyd days. The sloyd system of manual training was as perfectly a thought-out system as can be found in American educational history. It was dovetailed and balanced; it was correlated with history, drawing, mathematics, physics, psychology, logic, and the needs of practical life. There were sloyd addresses and sloyd exhibitions in the leading American cities to show those interested in education a system of manual training that trained the head, the heart, and the hand simultaneously. Sloyd has been dead these 15 years; the word is unknown to the younger generation of teachers. It was too perfect to become a part of an imperfect, growing, educational program such as ours in America is. Let us take warning from history and waste no time in verbally perfecting any system or scheme of teaching productive agriculture.

In place of rearing schemes by principles of deduction, let us substitute a variety of inductive experiments to determine the scope of secondary agricultural teaching. We must bear in mind that no man nor men in this age, no matter what their station, influence, or experience, can by fiat give birth to anything of enduring worth. Secondary agricultural teaching will be a matter of growth by the old, old method of trial and failure, here a little and there a little; finally we may expect that a variety of successful ways of interesting boys and girls in good farming will emerge. Already, we are experimenting with the textbook method, with the textbook and supplementary reading method, with the topical-library method, with the textbook and laboratory method, the school and home-garden method, the apprenticeship method, the project method, and perhaps other methods; and if the truth were known it is extremely probable that all of these methods are producing some results under certain circumstances and that none of them will work in all cases. The most we can do at this moment is to say that there is strong probability that some will receive wide adoption and that others will be discarded because they fail to produce productive farmers.

The opinion is gaining ground that our methods of reporting results have been borrowed from promoters rather than from scientists. "Boom," rather than impartial truth, seems our motto at times. We may agree that booming is legitimate. If so, we must take into account that booming is an expensive operation and somebody in the end pays the price. It has been very natural in the first

two or three years of the movement that we should be anxious to demonstrate that adolescent youth could be taught productive agriculture. The possibility has been demonstrated. The degree of practicability is in process of determination. What the scope or field of productive secondary agriculture is to be, and what the cost to the pupil and to society, are matters on which data must be gathered for some years. We need to be aboveboard and frank. Untruthful we never have been; but we have been unscientific in our manner of stating results. It is not a question of truth, but a question of the whole truth. The whole present movement is shot through and through by this partial reporting of results. Selected portions, detached from the group and the circumstances which rendered the accomplishment possible, are sent broadcast. It is the way of the promoter rather than the way of the scientist.

May I illustrate this practice by a case that has come under my notice within two months? A boy, not 16, after one year of training in one of the new agricultural schools, went into competition in stock judging with some 60 other boys, many of whom were older and some of whom came from good dairy farms. Pitted against these boys, this 16-year-old boy took prizes in every one of the three contests he entered, and in the last and largest he took first prize in a group of 30 boys. His widowed mother is making great sacrifices to give him an education, and the preparation and opportunity which this agricultural school gives a poor boy for earning money while getting an education is one of the hopeful signs of the day. I have investigated these facts and this report is true; but it is not the whole truth, and consequently misrepresents the situation as regards both the boy and the institution. What should be stated in addition to the facts given is that the boy had no training in stock judging until just before the last contest, and that was somewhat incidental and did not exceed eight periods. His home experience consists of contact with three scrub cows. The veterinarian who gave the brief instruction does not take any credit for the boy's success, nor does he regard the boy as possessing any talent in stock judging. This success is, in the terms of science, a fortuitous occurrence, which can not yet be classified. When all the facts are known the institution can claim no special credit. Indeed, the boy's success could be quite as effectively employed to demonstrate the foolishness of training in stock judging as it could be to demonstrate its wisdom. It proves nothing, demonstrates nothing—unless it be the truth of the saying of the prophet of old, "Out of the mouths of babes and sucklings Thou hast ordained strength." We can all repeat by heart Jerry Moore's corn-raising performance of 1910; but the question is, Does the fact that Jerry raised 228½ bushels prove anything? The trouble is it proves too much; it overshoots the mark. It is a fine bit of thunder for the

stump and the magazine writer; but all of us who are engaged in the very definite task of improving the methods of growing corn in any section of our land and of getting the boys to take up the work of their fathers, know it is a false god to follow.

Let us not forget in this connection the astonishing results obtained and published by a certain group of nature-study writers a decade or so ago, and the swift retribution that befell them in the loss of public confidence. It is a perfectly safe assumption to make that no adolescent boy in the process of learning the elements of crop growing and animal husbandry will make better records than experienced and seasoned men. If he is so reported, it is because conditions were made very favorable for him, or because in reporting the results extraordinarily favorable factors are not mentioned.

We must remember that this movement to train youth in productive work in school is under experimentation in other occupations besides that of agriculture. Some of us are so situated that we can observe and compare the results of apprentice work in dressmaking, millinery, cooking, house management, cabinetmaking, carpentry, plumbing, bricklaying, and typesetting with one another and with apprentice work in farming. The grade of work of these other apprentices after repeated trials is occasionally as good as that done by the journeyman workman of the community. The occasions become somewhat more frequent as the student nears the end of his course. Practically never, however, are the results when calculated in wage-per-hour units equal to the earning power of experienced workers. The following case will illustrate this point: A certain second-year apprentice in cabinet work was receiving B's and B+'s for the quality of his work. When, however, the time he spent on a job was taken into consideration in grading him, he received a D, so inefficient was he from the standpoint of earning capacity. This is significant, for there is little doubt that, taken as a group, those teaching the trades are better prepared and more skillful than those teaching productive agriculture.

In reporting any case of productive agriculture let us make use of a table of cost accounting, following the custom adopted in all scientific reports where quantitative relations are involved. This is necessary for the proper training of the apprentice farmer and for the proper enlightenment of the reader.

There are three steps commonly recognized in inductive science, namely, observation, or the obtaining of facts; verification, or the repetition of the facts; and generalization, or the planning of future action. The first two or the last two steps may be linked together; but the first and the third steps should never be linked. The present movement to teach agriculture in secondary schools is either in the first or the second of these steps of inductive science; we are in the

act of securing facts and of verifying statements of facts. Especially are we in need of verifying—in the sense of having the thing occur again—certain very encouraging reports of juvenile successes in productive agriculture that are coming from different portions of our country. Masters in inductive science have worked out a simple and well-nigh universally accepted method of recording and reporting results. The procedure in outline is:

1. To report the object of the experiment or study.
2. To ignore nothing that has the slightest bearing on the question.
3. To report truthfully all facts that minimize the worth of the experiment as well as those that make for its worth.
4. To make no generalization until every fact has been verified.
5. To publish nothing for the sake of promotion or self-glorification.

Said the great Faraday:

> The world little knows how many of the thoughts and theories which have passed through the mind of a scientific investigator have been crushed in silence and secrecy by his own severe criticism and adverse examination.

Were we always to follow this code of ethics, doubtless we should publish less but contribute more to the movement. We ought to retain entire the ethics of inductive science; but we can somewhat simplify its formula of reporting. Were we to give, in a single paragraph preceding the ordinary report of boys' work, the aid given, and the conditions favorable and unfavorable surrounding that work, together with tables of cost accounting, the records would become helpful to others rather than at times objects of more or less suspicion.

There is another class of experiments often reported by scientists, namely, reports of failures. In this period of searching for the best means of training boys in productive agriculture, could we know of methods and pieces of work honestly tried that failed, or that succeeded only in part, we should come to regard them as equaling or exceeding in value many reported successes.

DISCUSSION.

By T. I. Mairs, Pennsylvania State College, State College, Pa.

I did not have an opportunity of seeing the preceding speaker's paper in advance nor of knowing what it was to contain, and I am therefore not in a position to discuss it fully. With some of his statements, however, I do not agree at all. I do not believe that the man who has graduated from an agricultural college has no more chance of success if he undertakes to start an orchard than the man who has graduated from a classical college. If our agricultural colleges do not teach productive agriculture, it seems to me that there is no excuse for their existence. I have much confidence in their work, and I see no reason for making a distinction between "college agriculture" and "productive agriculture." The colleges may lay greater emphasis on

the principles of agriculture involved, and the secondary schools may lay relatively more stress on the application of these principles, but if college agriculture does not lead to more economic production, it is not worth the name, and our colleges are not fulfilling the purpose for which they were intended.

I agree with the speaker that the promoters have been working overtime, and that a great deal—better left unsaid or undone—has been said and done for advertising purposes. I believe that as to many schools the whole story has not been told; but I do not believe we should condemn the entire movement because a few persons or institutions have taken advantage of the present almost universal interest to get some free advertising. A certain amount of promotion is necessary, and a certain amount of advertising is necessary to create a sentiment. It is the business of the teachers of agriculture to create a sentiment. It is also the business of the teachers of agriculture in the secondary schools to act as a sort of balance wheel or to furnish ballast to hold the movement under control. I have not much sympathy with the so-called "back-to-the-land" movement. I would not teach agriculture solely for the sake of keeping the boys and girls on the farm. The cities need many of them, and the farmers need the cities; but we can not indefinitely draw the best from the farms to supply the cities. What we may do is to help to maintain an equilibrium between the two. Make farming more profitable and more enjoyable, and more of the efficient boys and girls will remain in the country.

As I see it, there is only one reason for spending public money—taxes—for the support of schools. That reason is that the community may derive benefit therefrom.

Three main purposes are to be served, it seems to me, through secondary school agriculture. These three, although somewhat distinct, can not be entirely separated from one another. We can not accomplish one without to some extent accomplishing the others. The first purpose is the broad one of benefiting the community at large through increased production and the creation of sentiment. Agriculture properly taught will result in a broader view, a more helpful sentiment, and a better understanding of production on the part of the community. It will put the country pupils into an intelligent and sympathetic relation with their surroundings.

The second purpose is to make better farmers; that is to say, directly to increase economic production. Whether we make "two blades of grass grow where one grew before," or produce two grains of wheat with the labor that formerly produced one, we are making better farmers. This will result in more economic production or more profitable farming, which will necessarily bring about better living on the farm and more of those things for the farmer that make life worth while. The farmer, having more money to spend, will have more sanitary homes and will demand better roads, better schools, better churches. He will have the means for cultivating the esthetic, the intellectual, and the spiritual, and also for conserving the physical, that his days may be long and profitable in the land.

The third purpose is to produce the so-called culture—a rather vague term generally taken to cover a number of mental qualities not easily described. These qualities will, of course, react on the physical conditions and the life of the community. A subject is said to be cultural when its main advantage is its effect upon the mind of the pupil. Ancient languages are cultural because they tend toward accuracy of expression and clearness of thinking. History is cultural because it tends to a proper interpretation of the past and a comprehension of the present. Mathematics is cultural because it is exact and trains in accuracy of perception. Science is cultural because it trains in logical arrangement and correlation of facts. Agriculture, while economically productive, may be just as logical a science as botany, physics, or chemistry. It comprises a body of knowledge which may be as fully organized and as systematically expressed. It may be presented in as logical a sequence as any other science. If taught equally well with other subjects, it can not be of less cultural value. It is not necessary that agriculture be unproductive in order that it

may be cultural. In fact, it seems to me that the more productive school agriculture is, that is, the more it tends toward actual increased production, the more logical it is and therefore the more cultural it will be.

Agriculture as a school subject has more than a cultural value, more than a production value, and is more than a creator of sentiment. Agriculture has a business value. Most of those engaged in it are farmers who practice it as a means of livelihood. Therefore, in presenting the subject we should not lose sight of the business side of it. We should recollect that it avails little to produce two blades of grass in the place of one if the farmer is to receive no more for the two than he received for the one. We should so train the future farmer that he may be helped to obtain his share of the financial benefits of increased production.

Agriculture is also to some extent a handicraft. It can be used in training the mind, the hand, and the eye to work together. The handiwork connected with it is worthy of the most skilled artisans. Agriculture, further still, is the broadest subject that can be presented in the schools. It is the foundation of the greatest of all productive occupations. It embraces some of the principles of all the natural and physical sciences; it also embraces the foundation principles of political economy or economic science. The questions of farm life are among the most important known to social science.

Within the last few years we have heard a great deal of the conservation of our natural resources. The natural resources will to-morrow be in the hands of those who are in the public schools to-day and for the most part in the hands of those who will not go beyond the secondary schools. Nothing will do so much toward creating a sentiment for conservation as the thorough teaching of agriculture in these schools. We hear much of the "high cost of living" and the "cost of high living." There is no means by which these may be reconciled so well as through the teaching of agriculture in our secondary and elementary schools.

Briefly then, secondary school agriculture should result in more intelligent appreciation of the problems of production on the part of the community at large, in an increased and more economic production on the part of the farmer, and in a development of the mind at least equal to that which may result from any other secondary school subject.

VI. REPORT OF THE COMMITTEE ON THE USE OF LAND IN CONNECTION WITH AGRICULTURAL TEACHING.

Committee: R. W. Stimson, Boston, Mass., chairman; C. G. Selvig, Crookston, Minn.; L. S. Ivins, Lebanon, Ohio.

The committee on the "Use of Land in Connection with Agricultural Teaching," which made its first report in 1912, was continued and now submits the following report for 1913.

The report is in three general divisions, as follows:

1. *Use of land by special, county, or congressional district agricultural schools.*—Mr. C. G. Selvig, superintendent of the Northwest School of Agriculture of the University of Minnesota, Crookston, Minn., has continued the study of the use of land in connection with agricultural teaching at separate and special agricultural schools. In view of the fact that Mr. Selvig had been assigned a formal paper on the program of the 1913 convention upon the subject "Home project work *vs.* laboratory and school garden plat work for high-school students," most of the information gathered by him regarding

the use of land in preparation for the present report was digested in his paper and was submitted therewith. Mr. Selvig's contribution to the report of the committee, therefore, consists of two sections submitted below as Appendix A, "1913 Summer practicum (home project) work of the University of Minnesota, Northwest School of Agriculture"; and Appendix B, "Reports of students on 1912 and 1913 summer practicum work at the University of Minnesota, Northwest School of Agriculture, Crookston."[1]

2. *Use of land by elementary schools teaching agriculture.*—A very careful report has been prepared by Mr. L. S. Ivins, of Lebanon, Ohio, on the "Use of land in connection with teaching agriculture to elementary school pupils." (For this report see p. 62.)

3. *Use of land by high schools teaching agriculture.*—The chairman of the committee continued the study of the "Use of land by high schools teaching agriculture." His report is presented herewith:

USE OF LAND BY HIGH SCHOOLS TEACHING AGRICULTURE.

Report by RUFUS W. STIMSON, Boston, Mass.

USE OF HOME FARM LAND MOST IMPORTANT.

In submitting its report in 1912, your committee expressed the opinion that an enormous opportunity for usefulness both cultural and vocational is missed where the teaching of agriculture by high schools is not so conducted as to stimulate home production and to bring that home production to a high state of efficiency through the patient and sympathetic but persistent supervision of competent agricultural instructors. In requesting that the committee continue its work, the association evidently shared in the opinion of the committee that the hour was "at hand for furthering, not so much the rapid extension of the teaching of agriculture to an ever-growing number of high schools, as the improvement of the quality of the instruction," where already established by centering it upon economic production carefully studied by the pupils at the schoolhouse and carried out under expert supervision on their own farms.

QUESTIONNAIRE AND AUTHORITIES.

State superintendents of public instruction and presidents or deans of agricultural colleges were asked to furnish the names and addresses of the high-school teachers of agriculture in their several States by whom the best use of land had been made. Letters were addressed to the instructors whose names were furnished. With the letters were inclosed copies of the same form of questionnaire as that used in the inquiry of the previous year. (See Appendix C.) Information was requested with reference to the use of the home farm land; also with reference to the use of land at the school.

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[1] See p. 77.

STATES REPORTING USE OF LAND.

Thirty-five States (23 in 1912) reported the use of land at one or more of their schools. The questionnaire was filled out more or less fully and returned by 28 States (22 in 1912). In all, 117 replies (56 in 1912) were received, as follows, the number of replies from each State being indicated:

High schools reporting use of land in 1912 and 1913, by States.

States.	1913	1912	States.	1913	1912
California	11	1	Mississippi	5	0
Colorado	2	0	Missouri	2	1
Florida	1	0	New Hampshire	2	3
Georgia	1	0	New Jersey	2	0
Idaho	6	0	New York	7	2
Illinois	7	1	North Carolina	1	2
Iowa	1	4	North Dakota	4	3
Kansas	2	0	Ohio	13	9
Kentucky	3	0	Oklahoma	2	0
Maine	5	4	Oregon	1	0
Maryland	7	1	Utah	3	0
Massachusetts	(1)	(1)	Virginia	2	0
Michigan	5	2	Washington	5	0
Minnesota	16	9	West Virginia	1	0

[1] Conditions personally known to the writer.

ONTARIO AND QUEBEC.

No reply was received with reference to the use of land by high schools teaching agriculture in the Province of Quebec, Canada. The following self-explanatory replies were received from the Province of Ontario. Information submitted by Bert W. Roadhouse, deputy minister, department of agriculture, Toronto:

I beg to acknowledge yours of the 4th instant in reference to the use of land in connection with the teaching of agriculture in secondary schools. I do not know that I have very much to add to the letter which I wrote you a year ago on this subject. We have continued and extended the plan of holding school fairs, which I then described, and as a consequence about 70 of these fairs were held throughout the Province this year, providing competition for the products grown by the children on their home plats. In addition to this we have conducted what is described as an acre profit competition. This is not exactly in connection with the secondary schools, except in so far as the competition is open to those taking a short course with our district representatives. The competitors in each county decide what crop they will adopt, and the prize is awarded to the one showing the greatest profit from an acre of land after making allowances for all the expenditure. The prize is free transportation and living expenses for the two weeks' short course in stock and seed judging at the Ontario Agricultural College. This is the first year that we have tried this plan, and we are just now awarding the prizes, so that we are not in a position to express any definite opinion as to this work.

Information forwarded from the department of education of the Ontario Agricultural College, Guelph, by President G. C. Creelman:

In 1907 special grants were given to schools and teachers for carrying on school gardening, 9 schools receiving these grants; in 1908 13 schools and in 1909 18 schools qualified.

In 1910 the teaching of agriculture was made the basis for special grants, with the following results: In 1910 17 schools qualified and received $750; in 1911 33 schools qualified and received $2,340; in 1912 99 schools qualified and received $4,370; in 1913 177 schools are listed for the teaching of agriculture, the grants to be given on the completion of the work in December, report of which is to be sent to the department of education.

Am sending with this a copy of "Agricultural Education Bulletin No. 7," in which you will see listed all the schools taking up this work.

Three hundred and fifty-five schools received material from the schools' division of the Experimental Union this year (last year there were about 250); in 52 of these schools, children's clubs have been formed, 20 being poultry clubs. "Agricultural Education Bulletin No. 3," also sent, lists all the different materials available for schools.

There have been over 800 teachers who have taken different courses in elementary agriculture and horticulture at the Ontario Agricultural College, but not all of these have obtained certificates for their work. In 1911 235 certificates have been issued, 77 in 1912, and 47 in 1913, making 359 in all. I do not know how many teachers have taken the work in the manual training department.

Re school fairs.—There are two different kinds of school fairs held throughout the Province, one being for one school section alone where the pupils bring the products of either their home or school garden, and the other being a township school fair where all the different schools of the township bring their garden material and exhibit it at a central school, have games, program, lunch, etc. The first of these fairs was held about 1908, and this year almost every district representative in the Province is holding either individual or township school fairs.

Re how much land is being used in Ontario for the instruction of pupils.—I do not think there has been any estimate made of this. A great many schools are taking up the work independent of this department, and we have no means of getting at this information.

SCHOOL LAND: DEMONSTRATION, "EXPERIMENT," SIZE OF PLATS, AND RESULTS.

Sixty-three high schools reported the use of land at their schools. The situation, however, has changed but little since the date of filing the first report of this committee. Many schools have so recently undertaken their work that they have little in the way of results to report. As was the case last year, the land has been chiefly used for demonstration purposes. Following is a fairly typical letter:

Our work is in the initial stages. I teach agriculture (secondary). My boys are very much interested. We have a farm of 40 acres. Perhaps later I could give more satisfactory advice. Am sending our catalogue under separate cover.

Regret was expressed last year that it had not been possible to secure information regarding the school at McNabb, Ill. It had been described by Dean Eugene Davenport, of the College of Agriculture of the University of Illinois, as an ideal rural school. The following are the facts regarding this school, reported by Mr. R. R. Snapp, in reply to our 1913 inquiry:

The John Swaney School is located in the country, 2½ miles from a small town. Practically all of the pupils come from the farm, and most of them intend to make farming their life occupation. A surprisingly large number of the graduates go to college

after finishing school, and domestic science and agriculture are the subjects studied in 80 per cent of the cases.

We have a large school garden, but have no regular farming land. The proximity of the Illinois Experiment Field makes field experiments almost unnecessary. The pupils, coming from the farm are well acquainted with the ordinary farming operations, and instruction therefore is devoted principally to the science of farming and not the art.

I am sending you a catalogue from which you will be able to get any information which I have not given you.

Poultry is given considerable prominence on the school premises of Stamford Seminary and Union Free High School, Stamford, N. Y. This school publishes an illustrated catalogue in which the respective places of land, equipment, and operations at the school and the home projects of the pupils are set forth. The agricultural instructor, Mr. W. G. Crandall, says that the school has about 3 acres of land. In addition to the poultry buildings and equipment, the school has charge of a neglected orchard for experimental work, which has been thoroughly pruned, the dead cavities removed, disinfected, and filled with concrete.

Opinions differ as to what should be the scale of operations on school land.

Prof. C. A. Cobb, Agricultural College, Miss., writes:

We have 27 agricultural high schools in our State at present, and each has a farm of 20 or more acres. These farms are used for demonstrating to the farmers the most modern methods of handling farm crops and animals, and for demonstrating the best methods of soil building. They are also used to furnish practical work for the boys and girls in attendance. Each boy is required to do a certain amount of work each week, the work being so planned that he may get education, exercise, and variety. In addition to this, each boy is permitted to do a certain amount of work for which he receives pay. There has been no difficulty in enlisting the interest of the boys in any and all kinds of practical farm work. The fact is, most boys desire to do much more work than can be given them. In some of the schools the boys and girls work the gardens and in turn get the vegetables free. Several boys are kept at the schools during the vacation period and are furnished work on the farm and in the gardens. In quite a number of instances, large quantities of canned vegetables and fruits have been put up by these boys for use during the coming season. The agriculturist of these schools in many instances has spent a great part of the summer among the farmers in assisting them, and in the work among the boys—Corn Club Boys. These agricultural schools, as a rule, are very popular with the people and are doing a great uplift work.

Differences of opinion as to what may be done with land by high schools are reflected in the following replies received from California:

Mr. A. A. SORENSON, Fresno, Cal.—Vegetable gardening I have made no attempt to practice, and do not intend to do so in high-school work. Much of our work is in horticulture and dairying. Plans are under way for the establishment of a small fruit farm in connection with a dairy, making the dairy the major. Land available for rent not desirable.

H. F. TOUT, Bakersfield, Cal.—First year, work given as "rural science." Name rural science selected because students shun word agriculture as yet. Course same as general agriculture. Great interest taken in work.

Second year, agricultural botany. This is general botany with an agricultural trend.
Third year, one-half year animal husbandry; one-half year dairying.
Fourth year, one-half year horticulture; one-half year soils and field crops.

Seven acres of land are utilized at the school in Bakersfield.

H. C. TRACY, Los Angeles, Cal.—A series of laboratory and field experiments fully testing each fundamental principle taken up in the course, such experiments and exercises occupying about one-half of the time devoted to general agriculture, the remainder being devoted to lectures, discussions, and examinations. The time given to applied agricultural practice is spent in the development of the ground where stock is maintained for work in plant propagation of every sort, according to season, and for tests both of fertilizers and of the fertility of the soil itself. The work is assigned to pairs or groups of students, each having some say in the matter according to preference and interest.

Two acres of land are utilized at this school.

W. L. JOHNS, Hollister, Cal.—I have not been teaching agriculture long, but have come to the conclusion that agriculture should not be taught as if the farm were the main point, but as a science. At present I am teaching with that in view, and the amount of land is not the question any more than the amount of manufacturing processes a school possesses where chemistry is taught. Teach agriculture as a science, and let the pupils apply it at home. My pupils apply every experiment to something at home. Pardon this personal view, but I feel that this land scheme is killing the subject as a high-school subject and keeping many schools from taking it.

J. E. GORE, Lodi, Cal.—We are on new grounds on which new buildings have just been erected, and the plans of the grounds are not complete. So we do not know how much or what part of grounds will be available for agriculture, and at present are using only a very small piece on which we have a nursery of apricots, peaches, and walnuts and a sand bed for germinating their seeds. We also grow plants for purposes of study on the small plat.

During September and October we did practice work in budding with our nursery trees. About February we expect to graft the walnuts. Sometime during the dormant season we shall transplant some of the nursery trees.

The only thing we have considered doing in a demonstrational way is in connection with artificial fertilizer on grapes. (This is a great grape country.) This will be more experimental than demonstrational, however, as none of it has been done here. It will be necessary to have the cooperation of some farmers, however, as the high school owns no vineyard.

This school reports that it has no productive farm land. It evidently has land of some sort.

The following are portions of a letter from Prof. F. L. Griffin, of the department of agricultural education, Oregon Agricultural College, Corvallis, Oreg., formerly associated with Prof. W. C. Hummel in the department of agricultural education at the University of California:

During the last two years Prof. Hummel and I have visited practically every high school in the State offering courses in agriculture, and we have, in addition, through correspondence, obtained information from nearly all the schools that have been using land in connection with their agricultural work.

Twenty-eight out of fifty odd California high schools maintaining departments of agriculture report that they have from 1 to 27 acres of land available for agricultural purposes.

Of the above, only three have been utilizing their land to the extent that they are worthy of special mention. These are Gardena, Bakersfield, and Hanford. The

instructor at the Hanford High School made most efficient use of the small plat of ground at his disposal. The other two mentioned are supporting several head of live stock on their farms. It is my opinion, however, that the instructors in these same institutions made far better use of the live stock in the community surrounding the schools than they did of their own.

From my own experience as a high-school instructor of agriculture, burdened with the responsibility of a 30-acre farm, and from my study of the utilization of land by high schools in this and other States during the last two years, I have reached some conclusions, which are not necessarily correct, or final, however.

Some land can be profitably utilized by nearly every secondary school maintaining a department of agriculture. This land, ordinarily, need not exceed 3 acres and can be called, perhaps, more fittingly, the school garden or outdoor laboratory. Such land would be used particularly in connection with the courses in soils and crops, or first-year agriculture as it prevails in this State, as well as in the work in horticulture. Also, in connection with the animal-husbandry work, it may be advisable in some cases to maintain a small poultry plant; but I believe that the ordinary school can get along just as well or even better by depending upon the poultry grown in the community and by encouraging the students to maintain small poultry plants at home.

In connection with the course in soils and crops, or with general science or first-year agriculture, as it prevails in this State, some land can be utilized to good advantage to show the "application" of the indoor laboratory work as well as to verify the statements made in the classroom and to demonstrate the principles studied. It is because this work will be largely "experimental" that it should be carried on at school as part of the regular laboratory work. Land would also be needed in connection with the course in horticulture, but only enough to meet the needs of the nursery and propagating ground. It might be advisable also to use some land for growing economic plants for class use, especially when the community can not supply them.

We are confronted with the problem of giving high-school students some training in the art of agriculture, but to maintain a farm for this purpose should not be attempted by the ordinary high school. Of course students will get some experience in doing things with their hands in the laboratory and field work required of them in connection with the various courses, but from the vocational standpoint they will need, in addition, the training that only long-continued practice can give them. Two means are available for giving our high-school students this experience: First, home-project work of an economic nature, properly supervised so that school credit can be given, and, second, practical farm work during summer vacation, for which school credit might also be given. I am afraid that school-farm practice will too often savor of artificiality or degenerate into mere manual labor. We must sustain the interest of the boys; and project work from which they will derive pecuniary returns, as well as school credit, will do this, in my estimation, better than will any other method.

Practically all of our special agricultural schools of secondary grade, such as congressional, judicial, county, and special district schools, are equipped with farms 50 acres or more in extent. As these schools are conducted on a dormitory basis, most of the students being removed from the paternal roof, they can perhaps utilize the land placed at their disposal to good advantage. So far as I can gather, however, through correspondence, these schools as a whole do not provide much more practical training in the art of agriculture than do the smaller schools with little or no land. The special agricultural school maintained as a part of a large city system, like the Gardena school, at Los Angeles, can perhaps use a large farm to good advantage. In such urban communities, live stock may not be available for class work, and I can see where it would be to the advantage of such schools to own and support the necessary live stock for student use. Also, such schools may find a way of providing the city boy, who has no land of his own, with the necessary ground for carrying on projects

at school under supervision, where he may obtain both the practical experience he stands in need of and become partially self-supporting as well.

Standing between the 2 or 3 acre garden laboratory and the 50 to 100 acre or more special agricultural school farm, we have the 5 to 10 or 20 acre farms that are causing a great deal of concern to those schools having them to support. There is more land than the students and instructor can take care of, and not enough to pay for the employment of a special farmer or hired help. I have been in communication with some Minnesota high-school instructors where, as you know, the Putnam law provides that the schools receiving State aid must maintain at least 5 acres in connection with their agricultural departments. I have been informed by these men that the 5-acre farms are causing them more trouble than all the rest of their school work put together. The experience of the schools in this State having more than 3 acres of land seems to bear out this statement.

The size of experimental or demonstration plats varied from one one-hundred-and-twentieth of an acre to 10 acres. Among the things shown, the following were mentioned:

"Row of alfalfa, varieties of corn, potatoes, and beans"; "legumes and fertilizer experiments, corn breeding"; "rotation, soil treatment"; "orchard care"; "wheat now, corn and oats in the spring"; "effects of various fertilizers"; "barley, fruits, and grasses"; "liming of soil, inoculation, good seed, spraying of potatoes"; "broom corn, and model farm garden, clover timothy, alfalfa"; "yields, new crops, cultivation and general management"; "cabbage and tomatoes, hill selection of potatoes"; "best and most up-to-date cropping methods"; "methods of culture, effect of good seed versus poor seed"; "difference between grain and livestock farming"; "what can be done in soil improvement by rotation of crops and the right tillage"; "that potash is profitable (in certain sections) on sweet potatoes"; "forestry"; "cultivation tests, moisture tests"; "relative value of commercial fertilizers and barnyard manure"; "garden work"; "best type of potato, sweet clover experiments"; "horticulture, commercial fertilizers"; "nursery stock, seed beds, ornamental plats, orchard rows"; "pruning, budding"; "millets, flax"; "reforesting project, potato-spraying project, fertilizer test with potatoes, sod versus tillage for trees."

No attempt has been made here to give an exhaustive account of all replies regarding the use of land owned or controlled by high schools. The replies quoted may, perhaps, be considered sufficient as an indication of the trend of sentiment and of the more profitable ways in which land has been utilized when owned or controlled by high schools teaching agriculture. In order that the difficulties which have been met may be properly emphasized, perhaps it should be said that in more than one high-school report animals owned by the school have been described as "white elephants," and that in one State where there has been an unusually extensive provision of land for the use of high schools teaching agriculture the land is reported to have been very generally described as "Hell's half acres."

USE OF OTHER THAN SCHOOL LAND.

Fifty high schools (22) in 1912 reported agricultural production on home farm land or on other land apart from the school premises, with more or less attention paid by the agricultural instructors to the home enterprises of their pupils. The list is as follows:

High schools reporting agricultural production on land other than school land in 1913.

California	Fresno	Fresno High School.
Do	Hollister	San Benito County High School.
Do	Sebastopol	Analy Union High School.
Idaho	Boise	Boise High School.
Do	Emmett	Emmett High School.
Do	Twin Falls	Twin Falls High School.
Illinois	Gibson City	Drummer Township High School.
Do	McNabb	John Swaney Consolidated School.
Maine	Hinckley	Good Will High School.
Do	Vassalboro	Oak Grove Seminary.
Maryland	Baden	Baden Agricultural High School.
Do	Calvert	Calvert Agricultural High School.
Do	Federalsburg	Federalsburg High School.
Do	Sandy Spring	Agricultural High School.
Do	Sparks	Agricultural High School.
Massachusetts.[1]		
Michigan	North Adams	North Adams High School.
Do	St. Johns	St. Johns High School.
Do	South Haven	South Haven High School.
Minnesota	Ada	Ada High School.
Do	Albert Lea	Albert Lea Associated State High School.
Do	Alexandria	Alexandria High School.
Do	Chatfield	Associated Schools of Chatfield.
Do	Deer River	Deer River High School.
Do	Fergus Falls	Fergus Falls State High School.
Do	Olivia	Olivia High School.
Do	Spring Valley	Putnam School.
Mississippi	Ellisville	Jones County Agricultural High School.
Do	Kossuth	Alcorn County Agricultural High School.
New Hampshire	Contoocook	Hopkinton High School.
New Jersey	Freehold	Freehold High School.
Do	Woodbine	De Hirsch Agricultural School.
New York	Belmont	Belmont High School.
Do	Brushton	Brushton High School.
Do	Interlaken	Interlaken High School.
North Carolina	Teacheys	Teachey's State High School.
North Dakota	Carrington	Carrington High School.
Do	La Moure	La Moure State High School.
Ohio	Bedford	Bedford Village High School.
Do	Bellevue	Bellevue High School.
Do	Hartford	Hartford Centralized High School.
Do	Lancaster	Lancaster High School.
Do	New London	New London High School.
Do	Oberlin	Oberlin Public High School.
Do	Shreve Valley	Shreve Valley High School.
Oklahoma	Beaver	Beaver High School.
Washington	Kettle Falls	Kettle Falls High School.
Do	Kiona	High School.
Do	Kirkland	Union High School.
Do	Mount Vernon	Avon High School.
Do	Sultan	Sultan Union High School.

[1] Conditions reported in Appendix E.

Mr. Lester S. Ivins, one of the State supervisors of agricultural education, Columbus, Ohio, reports that in Ohio dependence is placed almost entirely upon the home land of the pupils who are studying agriculture in the public schools.

Mr. R. E. Greene, agricultural instructor in the high school at Interlaken, N. Y., writes:

> The boys raised crops on their home farms, and I inspected the work each week. The most successful boy received a trip to the entire State fair as a reward. We find that both boys and parents are interested in such work.

The methods and purposes which govern the use of home land vary. At Stamford Seminary and Union Free High School, Stamford, N. Y., referred to above, the home work is described as a series of "experiments." The following is a statement published in the prospectus of that school:

> No work is to be taken in this line (home-project work) until the pupil undertaking such work has had or is having the subject in the course along the line of the home project. The home-project work consists of a series of experiments run on the home farm by the boy, under the direction and with the advice and cooperation of his father and the teacher of agriculture. Upon the completion of this experiment the boy sums his work in a carefully written paper which presents a complete discussion of the problem or experiment undertaken, the scientific facts and principles involved, and the practical results accomplished. For this the boy may receive regents' credit, varying from 2½ to 5 counts, according to the extent of the experiment.

In Massachusetts, in order to avoid misunderstanding, attention has been given since 1909 and is now given almost exclusively to the utilization of the home land of the pupils for "productive" purposes, the effort being to make the productive enterprises, or "home projects," of the pupils as large as may be consistent in each case with the age and strength of the boy on one hand and on the other hand with the resources, whether furnished by his father or by some other interested person at his command.

On the whole, it probably is safe to say that the trend of high schools teaching agriculture the country over is away from the utilization of school land and toward the fuller and more competent utilization of the home land of the pupils.

CORRELATION OF STUDY AND HOME WORK STILL RARE.

During the last year there have been important developments in the direction of correlating the agricultural study in the classroom and on the school grounds with the home farm work undertaken by the pupils. The answers to the questionnaires, however, show that close correlation still is far from being the rule. That the closest possible correlation is desirable, nobody, in answer to the question covering this point, even hinted that he was inclined to dispute.

SYSTEMATIC SUMMER SUPERVISION REPORTED.

This year the question as to whether or not there is now systematic supervision by the agricultural instructor of the home enterprises of his pupils was answered largely in the affirmative. Some instructors report that they supervise daily; some that they supervise once or twice a week during the term time and monthly during the summer. Others report that they supervise twice a week; others once a month; others "whenever occasion arises." A good many report that there is no supervision during the summer. It is interesting to note that whereas a year ago there were no replies in answer to the question as to how often during term time and how often during the summer the instructor supervised the home work, this year one-half submitted answers.

CORRELATION AND SUPERVISION DESIRABLE.

It is evident that there is a growing sentiment in favor of both close correlation of classroom instruction with home work and systematic and faithful supervision of that work through the producing season. Just as last year instructors expressed the opinion that such correlation and supervision would greatly enrich the value of the training and the interests of the pupils in their instruction, so this year there were replies of which the following may be regarded as reasonably typical.

From Neal J. Parker, Brushton, N. Y.:

I am hired for 12 months. It is my duty to teach agriculture only. During the winter months the work consists of recitation work and special laboratory experiments. About the first of April the work begins to be more out of doors on the home farms. From then on the pupils do individual work rather than classwork. Each one turns his attention to his special project. I always try to go over the plat with the boy and discuss its condition with him. Then and there we determine the general course which he is to follow. From then on I make frequent visits to the place, and we go through the field and discuss whatever may suggest itself. During the summer months my time is given up almost entirely to visiting the several pupils, helping them as they want help, pointing out to them anything they are overlooking. They keep accurate accounts of all these projects, and when everything is complete they sum it up in a well-written thesis and receive their special credit.

With a prefatory statement that he has been at La Salle only this year, and that, owing to labor "being difficult to obtain at the proper time, and poor at that," the school had discontinued the use of land on its own premises, Mr. J. H. Cairns, La Salle, Ill., writes:

I have had a few years' experience in high-school teaching—two years where we had a 15-acre farm, but little or nothing to work it with. We borrowed most of our tools and farm machinery. We took in $650 worth of products the first year and over $700 worth the second, but educationally it was not a brilliant success.

Difficulties:

(1) Expensive to work.
(2) Labor not reliable.
(3) Can not demonstrate actual farm practices, if that implies what should be the best farm practices.
(4) Can not get pupils to do work they ought to do, if it is for educational purposes. If not for this, why have it connected with the high school? If pupils are only going out to see others work, why not use adjoining or near-by farms?

Our home-project schemes work best as one-fourth, one-half, and 1 acre plats for town boys. One of our village boys last year raised 294 bushels of potatoes on 1 acre. Others did equally well.

From Ernest L. Dix, Burlington, Ky.:

We are pioneering in Kentucky and are, therefore, obliged to feel our way in the dark as it were. We have accomplished much in persuading farmers to test their seed corn, to use our milk tester, and in other similar activities. * * * What we really need is means of identifying our work more closely with the life of our farming community rather than to make agriculture a formal academic study.

From Mac Hoke, Idaho Falls, Idaho:

We find home work giving better results than work of a similar nature on plats owned by the school. Each boy in the daily course is required to keep records of cows on the farm. Farmers are urged to join the high-school cow-testing association, and boxes are left down where they leave samples of milk or products of milk. These are tested by the high schools, and reports are made to the farmers and to the Federal dairy department. We are testing 60 dairy cows at this time. More farmers will come in as soon as they have an opportunity to arrange it.

We do a great deal of practical work on the farms near, such as pruning, spraying, making butter, oiling harnesses, judging stock, repairing machinery, growing crops.

The instructor is here only for nine months, at $1,200.

We are able to arouse deep interest among pupils only by practical work in bringing subjects home to them, so that they can see the value of taking the course. The course is gowing in popularity, and we anticipate large numbers next year.

We are planning a 20-night course for farmers and others in which a series of demonstrations and lectures will be given. We are cooperating with the United States Department of Agriculture, the university extension department, the State boys and girls clubs, the county superintendent, and the commercial club of the city.

From Mr. G. D. Smith, Richmond, Ky.:

Our State is back in fruit culture, but we have as great possibilities in this line as almost any other State. I am devoting most of my energies to the development of our fruit interests, especially in the mountains.

I am organizing grafting and budding clubs among the school children. Each family in the district or each member of the club grafts 50 apple roots and sets them in garden or truck patch, and after one year's cultivation sets them in the home orchard or starts a new orchard.

For the last two seasons we have grafted tens of thousands of trees, and many of the orchards that have been started from this work are from 1 to 40 acres. One of the big things that has grown out of my fruit-club work was the establishment of an orchard in Rowan County of 1,658½ acres by the State commissioner of agriculture.

From Charles N. Frey, South Haven, Mich.:

I had a plat of land in connection with school work, but changed to the home-project idea and have had better success. I have some boys taking over land for

corn, alfalfa, and egg plant. Some raise fruit. Much interest is taken in this work, and in some of it, as in sowing alfalfa, I have made real demonstrators of the boys, and their crops have been very successful. At present I am working the boys into form so they can inspect the dairy herds and report to the health officer.

The farmer is convinced when the work is done before his eyes under no abnormal conditions, and he then becomes interested. Without his interest, much of our work is in vain. In one district, where parents were enthusiastic, I completed in one season what it would have taken three under more adverse conditions to have done.

SCHOOL LAND NOT INDISPENSABLE.

At the 1912 convention, attention was called to the fact that school land is not indispensable. It may be remembered that in the report of last year account was taken of the belief, at that time held by not a few, that agriculture could only be taught successfully where the school itself had land and live stock which closely approximated the ideal, each of its kind. Over against that view the fact was cited that both the winner of the championship in judging live stock in Massachusetts last year and the winner of the second prize were from a high school which was teaching agriculture, but which did not own a head of live stock of any description. The championship winner in 1913 in Massachusetts was also from a school which owns no live stock. The champions of 1912 and 1913, however, had made visits to farms, including the farm of the State Agricultural College, where good specimens of live stock had been observed and studied. It appears, therefore, to be possible to establish high standards and clear-cut ideals, although the boys begin their operations at their homes with the best land and live stock available; they are interested in improving their land and live stock as fast as time, opportunity, and their own skill will permit.

ECONOMIC RETURNS.

This year, as last, the efforts to secure information as to the profit of individual pupils from the working of land other than school land were largely unavailable. Figures submitted from Massachusetts last year showed that 25 boys—the 5 best from each of the 5 points in the State where this plan was in operation in 1912—earned from farm work in connection with first-rate work in school more than $5,000. Figures are submitted herewith as Appendix E, showing the earnings from farm work of the 5 best boys from 6 different points in Massachusetts in 1913. It will be noticed that their total earnings from farm work amounted to nearly $10,000. The secret of the large increase in earnings, compared with the relatively small number in excess of the number of one year ago, will appear in the report of the committee this year, if it is compared with the report of the committee of last year. The secret is that most of the boys in 1913 continued work which they had undertaken the year before.

and added to it new projects conducted under the supervision of their instructors in connection with their more advanced classroom instruction.

USE OF LAND HINDERED BY OTHER TEACHING.

The use of land, whether at the school or at the homes of the pupils, has been hindered during the past year, as it had been hindered prior to our previous report, by the number of nonagricultural subjects which the agricultural instructors were required to teach. Twenty-two (13 in 1912) reported that they taught only agriculture; fifty-five (41 in 1912) reported that they taught other subjects. The other subjects named were the following: Athletics, biology, zoology, botany, physics, chemistry, physical geography, bookkeeping relating to agriculture, English, Latin, German, history, algebra, geometry, commercial geography, civil government, applied science, sanitation, Bible, and catechism.

CONCLUSION.

Your committee adheres to its conclusions of a year ago as stated at the beginning of this report, and desires to go on record as strongly favoring the utmost utilization of the home land of the pupils, the closest possible correlation of agricultural classroom instruction with home farm activities, and suitable provision for systematic and efficient supervision throughout the producing season. In submitting this report your committee desires to say that it looks upon the study of ways and means of properly using the home land for purposes of agricultural instruction as scarcely begun. Your committee is willing to continue its labors and would suggest that the executive officers of the association bring to the attention of the administrative officers in charge of agricultural education in the various States and to the professors of agricultural education in the various State agricultural colleges the findings of this committee as submitted in its reports of 1912 and 1913.

THE USE OF LAND IN CONNECTION WITH AGRICULTURAL TEACHING IN ELEMENTARY SCHOOLS.

By LESTER S. IVINS, State Supervisor of Agricultural Education, Lebanon, Ohio.

For the purpose of obtaining accurate information from which to make this report, letters were sent to all of the State superintendents of public schools, to the presidents or deans of many of the State agricultural colleges, and to nearly all of the deans or agricultural teachers of the State normal schools. The letters stated the purpose of the report and asked for the names and addresses of persons who could likely give the information desired in the questionnaire inclosed. The questionnaire was as follows:

QUESTIONNAIRE.

1. Land at or near your school.
   (a) Amount of work required of the pupil in preparing the land and cultivating the crop.
   (b) Records that pupils are required to keep.
   (c) Products planted.
   (d) Method of securing seed.
   (e) Plan of supervision during the school and summer months.
   (f) Amount of land used by each pupil.
   (g) Plan of disposing of products and the money secured for same.
   (h) Results you expect to obtain by the use of land.
2. Land at home of the pupil.
   (a) Amount of land used by each pupil.
   (b) What is planted?
   (c) Where was seed secured?
   (d) Method of supervision during the school months and summer months.
   (e) Plan of disposing of products raised.
   (f) Interest parents take in the work.
   (g) Results you expect to obtain.
3. If you use land both at home and at or near school, tell which plan you like better.
4. School gardens, vacant-lot gardens, or home gardens.
   (a) Nature of the work.
   (b) Plan for securing and furnishing seed.
   (c) Amount of ground or size of each garden.
   (d) Method of supervision during school and summer months.
   (e) Method of scoring garden.
   (f) Reward given for best garden.
   (g) Plan of disposing of products and money secured for same.
   (h) Effect of the work upon the pupils, parents, community, and school.

Replies were received from 40 States, the District of Columbia, and Porto Rico. It is true that some of the persons did not answer the questionnaire fully, but they did send information that aided very materially in making up the report. I desire to give credit to Mr. A. C. Monahan, of the Bureau of Education, for valuable information contained in this report on part of the work done in the States of Louisiana, Massachusetts, Missouri, North Carolina, Tennessee, and Virginia.

USE OF LAND BY STATES REPORTED.

Thirty-three States, the District of Columbia, and Porto Rico reported the use of land at one or more of their schools either at or near the school, at the home of the pupil, or in connection with regular school-garden work.

The number of replies from each State is indicated: California, 3; Georgia, 1; Idaho, 4; Illinois, 2; Indiana, 6; Iowa, 4; Kansas, 6; Kentucky, 6; Louisiana, 6; Maine, 1; Maryland, 1; Massachusetts, 3; Michigan, 2; Minnesota, 6; Missouri, 4; Montana, 1; Nebraska, 2;

New Hampshire, 1; New Jersey, 1; New York, 4; North Carolina, 1; North Dakota, 3; Ohio, 42; Pennsylvania, 1; Rhode Island, 1; South Carolina, 2; South Dakota, 2; Tennessee, 2; Vermont, 3; Virginia, 1; Washington, 1; West Virginia, 1; Wisconsin, 3; District of Columbia, 2; and Porto Rico, 1.

This report is on the use that is made of land in the teaching of agriculture in the elementary schools, but in a few instances it overlaps somewhat similar instruction given in the high school. This is true when the high-school and grade pupils are in the same building or have access to the same land. In most schools, however, where this condition exists the number of pupils that receive such instruction in the grades is larger than in the high school.

In describing the work that is done in each State, the writer has thought best to place the authority for the statement at the beginning. By this arrangement those persons that desire more detailed information will know to whom to write.

CALIFORNIA.

C. A. Stebbins, California State Normal School: This institution aids in the organization of the work in the elementary schools. As soon as clubs are organized the normal school sends each member a paper called "Junior Agriculturist." Average size of gardens used in State is one-eighth of an acre. At present, emphasis is placed on home gardens. Fifty thousand children in the State had gardens either at home or at school last season. Over 250 garden clubs were organized last year with an enrollment of 5,000 boys and girls. County school superintendents organized the clubs. The normal school aids in the distribution of seeds to club members for their gardens.

C. F. Palmer, supervisor of agriculture, Los Angeles: At some schools the board of education has plowed the land; at others the boys do the plowing; and at others the pupils spade the land, depending on conditions, age of pupils, character of soil, resourcefulness of principal of school, and so on.

We strive for interest in live operations first, requiring few records. If teachers would correlate the work in language with gardening, for instance, it would be fine for pupils to keep records. But if the record has to come out of an already too-limited gardening time, I do not think I would favor much record making. We suggest it, and some of the schools are making it work fairly well. More time for gardening will help to solve that problem. I believe in the idea.

Fourth-grade pupils raise vegetables only; fifth, some annual flowers in addition; sixth, make a specialty of floriculture; seventh, of ornamental gardening, elementary forestry, etc.; eighth, much the same as the seventh.

We furnish some seed; pupils buy some seed. It would be well for pupils to furnish their own seed in most cases.

In some of our schools, the pupils are planning to grow vegetables and sell them at the municipal markets, of which this city has about a dozen. Usually the pupils have had all they raised. The pupils raising vegetables for the market will turn the money into the school treasury to be used for school purposes.

Parents are much interested in the work; many home gardens were in evidence last year as the result of school gardening—about 15,000 in our city. We are interested in the home gardens in particular. Produce from the gardens is our chief by-product; to make children grow is our chief object. If we had the teachers to look

after the work, we would make much more of a feature of home gardening. Pupils who have gardens at home are sometimes excused from school gardening. I wish we could do more along this line. A few teachers go from home to home and help pupils in their home efforts.

This is only the second year that the work has been organized in our city, and we know that it has tremendous possibilities. We need more better trained teachers, more time for the work, more funds to use. Prospects are bright, however; much enthusiasm is present; and we see a fine advance made over our first year's work.

GEORGIA.

M. L. Brittain, State superintendent of schools: Land is used in connection with 11 district agricultural high schools, and many of the county superintendents have elementary schools at which girls and boys are encouraged to use land at home for producing corn and tomatoes.

IDAHO.

Grace M. Shepherd, State superintendent of public instruction: We have 13 high schools with agricultural departments in high schools and grades in this State.

W. D. Vincent, Blackfoot: Our pupils use home land. They plant 1 acre of potatoes or beets and keep complete records. Each pupil furnishes his own seed. We hope that our pupils will get better notions of modern agriculture from this home garden work.

George W. Colton, Fruitland: Last year we used 1 acre of land near the school building. We used two periods a day in fair weather. Pupils worked as a class and not as individuals. Seed was secured from the Government and from agricultural schools; some was brought from home, and some was purchased of dealers. We did not have summer supervision, and therefore lost much of the good results we anticipated. Our pupils cultivated potatoes and corn. We believe in the teaching of agriculture, but school authorities must not expect it to be a panacea.

ILLINOIS.

A. W. Nolan, College of Agriculture, Urbana: Land is used in connection with the teaching of agriculture at the John Swaney Consolidated School, the Rollo Township school, the Blackburn College school, and the Bloomington schools.

S. H. Danisman, Rollo school: We have 10 acres in connection with our school. The regular school garden will be about 1 acre this year. One-fourth of this amount is given to the grades. The size of the plat depends on the number in the class. Our experimental plat contains one-fourth of 1 acre. Some school-garden plats contain one-half acre. The ground last year was plowed and cultivated by the boys in the class. Boys and girls each cultivated their own plat. The children made candy and sold it to obtain money to purchase seed. All work on gardens was recorded in notebooks by the pupils. All common vegetables were cultivated. Young plants for the garden were raised in hotbeds and cold frames. We did not have supervision over the gardens cultivated by the children at their own homes. Our new school started last year, and the agricultural work appeals strongly to most of the pupils.

INDIANA.

H. S. Grumer, Indianapolis, assistant superintendent of schools: Last year over 16,000 children out of a total of 30,000 in our public schools had gardens, most of which were home gardens, with a total area of 115 acres. Ground was plowed and harrowed before the pupil began his work. Pupils purchased their own seed. Plats were from 250 to 1,000 square feet in size. Each pupil marketed his own products and was required

to pay one-fourth of his proceeds to the school. Plats were supervised by teachers and friends of the pupil. Both the school gardens and the home gardens were successful. Several vacant-lot gardens were cultivated by pupils of the different schools under the same general plan as used in the other gardens. Our pupils were very enthusiastic over the work, and this enthusiasm was carried into the homes and the community. We tried to tie up the garden work with the other school subjects, such as English, arithmetic, and geography. We feel in Indianapolis that the garden is one of the most valuable means of creating an interest in the school and in the community.

H. L. Rogers, county superintendent of Pulaski County: We had many interesting contests in corn growing by members of boys' corn clubs. We have a boys' and girls' poultry club in this county, with 200 members. The pupils are raising fancy poultry on home farm land. Each pupil grows a special variety that he may like best. High-class eggs are donated by different poultry fanciers.

Brainard Hooker, Lafayette: More than $150 was given in prizes to winners in corn and poultry contests last year. We use only home farm land in our contests. We use 1 acre in corn contests and one-fourth acre in garden contests. Seed is obtained from Washington, D. C. Gardens are supervised during summer by teacher. Credit is given at school for home work done. Work is of much interest to pupils, parents, and the community. We give considerable attention to arbor-day planting. Our last arbor-day was October 31.

H. C. Reed, Pendleton: So far we have confined our work to corn growing. Boys selected home seed under our supervision. We supervise work by visiting during the summer. Our plats are from one-half acre to 1 acre in size. Pupils and parents are much interested.

IOWA.

F. E. Fuller, Orange City: We have acre corn contests at home. Pupils display corn at county fairs and farmers' institutes. Girls' canning clubs started this year were a failure, because they were not properly supervised. Boys select their own seed, if they desire. Other seed is sent out from the county farm. The boys keep an account of their expenses and incorporate it in their reports at the close of the season. This county in 1911 had 41 members in the corn club; last year, 87 members; this year, 140. Interest is growing.

KANSAS.

O. C. Hagans, Effingham: We have 10 acres of land half a mile from the high-school building. The pupils do not prepare the land and do not cultivate the crops. They keep records of ear-to-row tests of corn, of yield of corn, of different treatments, of results of fall plowing and spring plowing, of barnyard and green manure, of fertilizer tests, and of variety tests of the different crops. They also make observations of the variations in growing crops under different conditions. They observe clover, timothy, wheat, oats, and cowpeas that are under cultivation. The seed planted is selected and tested by the pupil. Seed wheat for variety tests is secured from the State experiment station. The school work is under my supervision during the school months, and during the summer months I give directions that are followed out by the pupils. The products secured from the plats are sold to farmers or dealers. We expect this use of land to interest our students in the study and in the investigation of better agriculture, and thus to increase their efficiency.

W. A. Hendershot, Dickinson: We have 13 acres of ground used for the high school, 12 for farm work and 1 for garden work. We have apple trees under our care near the school. The land is rented by the high-school board. Garden truck is planted in the garden; cereals and forage crops on the farm. Record is kept of all work done. Seeds are furnished by farmers and seed houses. Pupils take some of the products home; the rest they sell to help pay expenses of operation. We find the use of land serves to

educate the student by doing and seeing and to test varieties and methods of cultivation. We are considering giving credit to pupils at school for some of the farm work done at home.

Z. W. Zahnley, Eldora: We have a man to operate our demonstration farm, and he takes the crops for his pay. Pupils furnish part of the seed and the agricultural college furnishes part. Pupils make complete reports of all demonstration work done on the farm. This fall we are planning different systems of crop rotation. Students do most of the planting and harvesting during the summer vacation. I am employed for 12 months, and thus keep the work going during the summer. The students voluntarily visit the farm during the summer months. We are enthusiastic over the demonstration work and feel that it is very beneficial to our students.

KENTUCKY.

V. O. Gilbert, assistant superintendent of schools in State department of education: There are many rural elementary schools teaching agriculture and using land for school gardens and demonstration work. The sentiment is rapidly increasing for a law requiring the teaching of agriculture in all rural schools.

G. D. Smith, Richmond State Normal School: Pupils at the training school are required to cultivate and plant vegetables. They keep an account of cost of labor, of fertilizer used, and of methods of cultivation. They get seed from good seed dealers. Teachers supervise work during the school months and a special officer during the summer months. The school plats are about one-tenth of 1 acre in size. Products are sold in near-by towns. The home land is in ¼-acre lots for tomato clubs and 1-acre lots for corn clubs. We have grafting clubs that set from 1 to 4 acres of orchard trees each year. These clubs also raise strawberries and all kinds of truck between the rows in the orchard. We expect the gardening work done by the pupils in this school to aid in revolutionizing old methods used by their parents. Teachers are trained in teaching agriculture by observing work of the children under our management. The students in our horticultural classes grafted 20,000 trees last winter and sent these trees to their homes to be planted in home orchards.

H. H. Cherry, president of Bowling Green State Normal School: The school garden planned by Miss Laura Frazee, Dr. Fred Mutchler, and W. L. Taylor was cultivated and brought to fruitfulness by the children of the grades in the training department. The children gathered a good harvest of beans, lettuce, radishes, tomatoes, and onions, as well as many kinds of flowers on the land they cultivated.

C. L. Clayton, Louisville: We had 125 gardens worked by children or adults this year. They varied in size from 20 by 25 feet to 43,500 square feet. The average size was about 1,500 square feet. Ninety of the gardens were back-yard gardens; three were school gardens; and the remainder were vacant-lot gardens. Our garden club started with the idea of educating the children along gardening lines and of making use of some of the large areas of vacant land in this city. All members paid for seed used. The club furnishes instruction and advice when necessary. The superintendent of gardens has charge of all work done and visits each garden as often as possible. We divided the city into 12 sections, and had a model garden in each section. This model garden was worked by an expert gardener. All children in each section could visit this model garden and thus secure information to use in working their own gardens. Each prize city garden must contain 500 square feet and can be made either 20 by 25 or 10 by 50 feet. Model gardens in each section are made to correspond to the requirements of the prize city garden. Our prize city gardens are scored as follows: Thirty per cent of cultivation of soil; 20 per cent for care of plants; 30 per cent for quality of vegetables; and 20 per cent for quantity of vegetables. Cash prizes are offered in two different classes: Class A includes boys' and girls' sections. The children in these sections are from the age of 10 to 18. Class B includes persons over 19 years of age.

These cash prizes are offered in each of the 12 divisions of the city. For persons that cultivate gardens of size different from that of the standard prize garden we use the following score card: Quantity and quality, 50 per cent; cultivation, 25 per cent; condition of plants, 12½ per cent; plan of garden, 12½ per cent. Prizes are also given on gardens other than the regular prize city gardens. This gives all a chance to compete for prizes, no matter what the size of their gardens. Prizes were offered by the State department of agriculture. We considered our work very successful and next year we expect to have all available space in our city planted in gardens.

LOUISIANA.

C. J. Brown, State supervisor of rural schools in State department of education: We have 39 agricultural schools using 10 or more acres of land at each school. In addition, certain types of work are done at the following-named schools: Calbasse, Seventh Ward School; Baton Rouge; Live Oak, Sunny Hill; Chenal; Oak Grove, De Soto Parish; Oak Grove, Bentley; Linville; Hico.

E. S. Richardson, director of boys' and girls' clubs: We have a large number of elementary schools doing gardening on school grounds.

Charles W. Price, Sunny Hill: We use 30 minutes a day for field work and require records to be kept by each pupil of all work done. All the common vegetables are raised. We secure seed from the Government, from experiment station, and from seed companies. No definite plan of supervision is carried on in the summer. Pupils work as a class and not as individuals on the plats. The work serves for demonstration purposes, and the products raised are distributed among the children for home use. Where home plats are used, boys have 1 acre, girls one-fourth acre. At these plats the children cultivate corn, potatoes, onions, and tomatoes. Products from the home garden are sold on the local markets. Parents are taking a great interest in the work. Thus far our land used at or near the school has given us the best results because of closer supervision. We are planning a nursery for next year. In this we expect to teach grafting, pruning, care of plant diseases, and proper cultivation for an orchard. Our work is popular with both pupils and parents. This plan at Sunny Hill is typical of the work done at schools in this State.

G. F. Fowler, Gaars Mills: This is what is called in this State a "second-type agricultural school." All work is done on home-farm land. An acre is given to corn and an acre to cotton by each pupil. The pupils select the best seed that they can buy. A record is kept of all expense of each plat, and proceeds go to the boy that does the work. The boys are also in a pig club, and several girls are members of tomato clubs. I work with the children all during the summer on their home-farm plats. We shall undertake no garden work at or near the school.

Robert P. Howard, Baywood—A first-type agricultural school: We are using 10 acres for our model farm at the school. We use 1 acre for garden work. All field crops are raised on the farm. Vegetable products not readily marketed are canned by the children. Students are supervised by teacher of agriculture. Students work land in squads, so that each student gets benefit of all kinds of work done.

A. C. Monahan, United States Department of Education: Ten rural schools in this State this year are receiving $100 each from the State to assist them in teaching agriculture. They are all schools with more than one teacher and are located in different parts of the State. One of the school-teachers teaches agriculture in the school and gives a part of each day and all of his Saturdays to supervising home gardens operated as a required part of the school work. The schools maintain no farms, but give all the practical work in agriculture at the school. In connection with each school will be a hotbed where early plants will be raised to be set out in the home gardens.

MAINE.

Payson Smith, State superintendent of public schools: There are 15 school systems in the State which give school garden work special attention. The number of individual schools with gardens is 50. Land is used in teaching elementary agriculture in all the elementary schools at the several State normal schools.

MARYLAND.

M. B. Stephens, State superintendent of education: Fifty-five acres are used for experiments and demonstration work at Ridgley school; Spark also has land. Other schools that use ground for experimental purposes are: Baden, 20 acres, and Calvert, 10 acres.

MASSACHUSETTS.

O. A. Morton, State agent in charge of club work: Home and school garden work is conducted in 187 towns and 29 cities. Brockton and Worcester have large areas cultivated by boys and girls. A few statements taken from Mr. Morton's letter to garden leaders follow:

Potatoes, beans, field corn, sweet corn, or tomato seed with Club Primer have been sent to 19,236 boys and girls in 212 towns and cities. The seed and literature weighed over 7 tons. These boys and girls were urged to make exhibits of the best products at some agricultural fair. The work of these small gardeners is very important. Many of them will acquire the knowledge and skill which will enable them later in life to cultivate a large home garden and to take pleasure in the work. Through the cultivation of these small gardens they will become interested in larger horticultural or agricultural activities. If neither of these results follow, they will be stronger physically, morally, and intellectually because of this intimate touch with nature. In addition to these home and school garden members, there are 451 boys and girls in 102 towns planting larger areas as follows: Number of members in 1-acre corn club, 25; ¼-acre corn, 39; 1-acre potato club, 4; ½-acre potato, 14; ¼-acre potato, 57; ⅛-acre potato, 122; $\frac{1}{10}$-acre or $\frac{1}{12}$-acre market garden and canning club, 75; small area market garden clubs, 115. The aim next year will be to organize in as many towns and cities as possible agricultural clubs and girls' canning clubs, with officers and leaders who will assist the members in planning and executing the plans, but not do any of the work. One great need is local leaders who are willing to take in charge during the summer three to five members, whom they will visit and advise, measuring their plats and cooperating in making them successes. Another need is local women who have the knowledge and the time to organize clubs of girls and to instruct them in canning and in other domestic activities.

MICHIGAN.

W. H. French, East Lansing: Contests of all kinds on home farm land, school-garden work at a few schools, and on several home gardens and vacant-lot gardens have been carried out in this State.

MINNESOTA.

C. G. Schulz, State superintendent of education: We have special courses in agriculture in 150 high and graded schools.

D. D. Mayne: There are 30 Putnam schools that are required by law to have a tract of land of not less than 5 acres. Many of the Benson-Lee schools, of which there are over 100, have provided plats of land for use in connection with their agricultural departments. Both St. Paul and Minneapolis have worked up considerable interest in home school garden work.

E. A. Pickard, Cokato: On the 10-acre school farm the students observe the operations as conducted by the department and help in the spring and fall with any feature of the work that may have a particular educational value; for example, selecting seed corn, planting different kinds of strawberry beds, and so on. Our agricultural students are required to take the course in farm accounts, but are encouraged to

use the actual accounts from their home. Our pupils select seed and save it for our planting. Our instructor in agriculture is engaged the year round and supervises all work of the pupils. The pupils have small plats at home in which they cultivate corn and observe the rotation and fertilization results, and grow small fruits. The products raised by the children are sold where they will bring the most, and the money goes to the general fund in the agricultural department. All land cultivated is used as an outdoor laboratory for demonstration, not for experimentation. Results of land work make both parents and children more interested in scientific agriculture. We think the land cultivated at school is important as a laboratory to supplement the class work in the school, and we feel that home work should not be neglected, because it furnishes an opportunity for children to practice on their home farm land the scientific principles learned at schools.

MISSOURI.

George W. Reavis, State rural school inspector: A large number of counties have introduced small plats as school gardens in the rural schools. Savannah school children raise products and sell them. Country schools use a plat of ground 15 or 20 feet square to germinate seeds, watch the effect of moisture and fertilizers, and make notes and drawings of what they see.

C. C. Thudium, Fredericktown: We require of each pupil an average of 90 minutes a week in the cultivation of vegetables or farm crops on the land at our school. Each pupil is required to make a plat of all the grounds and of each individual's plat and to keep record of work done, of cost of work, of cost of seed, of price of products raised, and of gain in production over cost. Potatoes, corn, alfalfa, peanuts, cowpeas, and all the garden vegetables are cultivated. Seed is obtained from the State department of agriculture. The teacher or some experienced person supervises the work during the summer months. Each pupil's garden is 20 by 20 feet, and in addition to this he assists in cultivating an acre and a half of land that contains some field crops. We also have a nursery for experimental work. We have been successful with both land at school and land at home that has been cultivated under our supervision.

MONTANA.

H. A. Dever, State superintendent of public instruction: Supt. John Dietrich, of Helena, has done some work along the line of using vacant city lots. In the rural districts the Northern Pacific Railroad has been offering a medal to the schoolboy in each county who has the best exhibit of either potatoes or corn, and the State Fair Association pays the expenses of this boy for a week in attendance at the State Fair. We are planning to extend the teaching of agriculture more each year.

NEBRASKA.

M. M. Graham, South Omaha: We have good interest in school home gardens. The city council donated money to buy seed and the Union Stock Yards Co., of this city, gave cash prizes. These gardens were carried on in all 11 wards in the city. We had good results.

W. R. Pate, Alliance: All work is done by pupils on ¼-acre plats. Instructor is hired for 12 months. All produce is sold on local market, and profits go to school funds. Seed is donated by interested citizens.

NEW HAMPSHIRE.

H. C. Morrison, State superintendent of public instruction: School garden work is being done quite extensively in the elementary schools over the State, and we are training all students in both State normal schools for carrying on this work in the elementary schools. We have this year 13 agricultural secondary schools, all of

which are using land either on the school grounds or at the homes of the pupils. We prefer the latter. Two of these schools, however, have large farms which they are beginning to use for demonstration purposes.

NEW JERSEY.

C. H. Robinson, State Normal School, Montclair: Agriculture is taught at Freehold, Atlantic, Highlands, and something is done in connection with the agricultural work in science classes at Cape May Courthouse. Some school garden work has been done at Montclair, Bloomfield, and Newark. Some very good work in garden activities is done by the teachers in the training school who are preparing to teach in the elementary grades.

NEW YORK.

L. S. Hawkins, specialist in agricultural education in State department of education: Special attention was given to work done at St. Clairville, Gowanda, Yonkers, Auburn, and Walton.

F. R. Darling, Walton: A club of our agricultural students was organized to sow alfalfa upon their home farms. Our instructor in agriculture is engaged for 12 months, and the most of his time during last season was spent in visiting the homes of the members of the alfalfa club and supervising the planting of the alfalfa. Very satisfactory results have been obtained from this work. The year before similar work was done in the formation of potato clubs. The seed in each case was furnished by the student, and the crop was given to him. Our instructor in agriculture also supervised home gardens of our grade pupils. Each pupil was required to cultivate at least 1 square rod of ground at his home garden. A committee appointed by the local civic club inspected these gardens at the close of the season. The supervisor visited them to give advice and encouragement to each contestant. Home gardens were more successful than others.

[District superintendents at Seneca Castle and Batavia are reported to have good school garden work in charge, but no reply was received from letters to them.]

NORTH CAROLINA.

Zebulon Judd, superintendent of schools, Wake County: [Mr. Judd's method of conducting school agriculture with the use of land is described in Bulletin No. 28, 1912, published by the United States Bureau of Education. Supt. W. H. Pittman, Tarboro, and Mary Arrington, Louisburg, have similar work in their counties. Prof. Monahan says that county superintendents in various parts of the country have reported good success with the Wake County plan, and that one Arkansas superintendent found it very successful.]

NORTH DAKOTA.

E. J. Taylor, State superintendent of education: Good work is being done at Beach, Grafton, Carrington, La Moure, Berthold, and Velva.

C. N. Nelson, Beach: Our school farm is devoted to the raising of wheat, alfalfa, barley, corn, potatoes, and flax for experimental purposes. Seed was obtained from seed houses. Our teacher of agriculture has charge of the work the entire year, but the board of education allows him six weeks vacation at a time when there is little being done on the school farm. We sell our grain at the elevator, and this is the only crop we have produced beyond what we use in the classroom. We sell potatoes to the local store and take credit toward grocery bills for the domestic science department. We do a great deal of extension work in rural communities. Our instructor in agriculture gives lectures in the rural schools on Friday or Saturday evening on ways and means of improving the agriculture in that community.

J. H. Bradley, Berthold: We have a farm of 10 acres at the school. The pupils have garden and flower plats only to care for. These plats occupy about 1 acre. The 9

acres are farmed under the direction of the board of education and myself. Pupils are not required to keep technical records. The board of education furnishes seed. Crops are sold and the money is used to defray expenses. The object of our work is to teach the farmers to rotate properly and to show them what is possible under proper methods of cultivation. Little home land is used except at a few places for the raising of corn. All parents, as well as pupils, are greatly interested in our work.

OHIO.

Report taken from outline of school plans submitted by school superintendents to the four State supervisors of agricultural education, in the State department of education: H. L. Goll, northwest section; S. A. Harbourt, northeast section; J. R. Clark, southeast section; and to Lester S. Ivins, of the southwest section. Information on the corn and wheat contest was also secured from A. P. Sandles, president of the agricultural commission, Columbus. The large towns and cities nearly all have some form of school garden work done by elementary children. The number of gardens depends upon the size of the town or city; they range from 50 in the small towns to 5,000 in Cincinnati and Cleveland. The work done at Dayton, Ohio, is perhaps typical of that done in other Ohio cities. Mr. C. C. Davidson, Dayton, has charge of all agricultural gardening, tree and shrub planting work, and makes the following report:

Each school in the city has a demonstration garden. All schools encourage home gardens which vary in size from 2 by 4 feet to almost a whole back yard city lot. A paid supervisor visits the demonstration plats once or twice a week and meets all the children who wish his help and advice. This gardener is paid by our playground and garden association. This association furnishes part of the seeds, parents furnish part, and pupils purchase part. Pupils do all the work, keep account of the amount of vegetables sold, and make reports on the work done. These home gardens are also visited by volunteers who inspect and give grades on the garden work done. Prizes are given for the best garden at each school and also for the best in the city. Pupils are delighted with the work. We have made special arrangements with the Springhill Nursery, Tippecanoe City, Miami County, Ohio, from whom we buy for children (with their money) from 12,000 to 15,000 trees, flowers, shrubs, and bulbs. This firm makes special prices to schools in all parts of the United States. The National Cash Register Co., of Dayton, has from 50 to 100 boys' and girls' gardens each year. The company offers prizes and free trips to winners. The first-prize winner last year, Clifford Sachs, raised $21.75 worth of vegetables on a plat 11 by 53 feet. Special booklets on the garden work at this institution can be secured free. These give all details.

Prof. Lantis, of Cincinnati University, has charge of the school garden work in Cincinnati. The work was successful last year. An exhibit of sample products from some of the gardens was made at the close of the season. This plan is generally practiced all over the State. Cash prizes are given on the best work exhibited. Seed is obtained in different ways—from the board of education; from parents; from welfare associations; from the Government; from the State; from seed companies for a cent a package (viz, the Flower Mission, Cleveland); from contributions by farmers; from Y. M. C. A.'s; from enthusiastic persons who desire to stimulate the work; or from the teachers themselves. A conservative estimate of the number of elementary pupils cultivating gardens in the towns and cities would be 30,000. In the country the pupils give their attention more to the acre of corn, the acre of wheat, or to the flower, vegetable, and lawn contests. Last year we had about 1,500 boys in the State acre-of-corn contest and 200 in the State acre-of-wheat contest. This year we are not having the wheat contest, but we have 3,000 boys in the State acre-of-corn contest. This does not include boys in many local corn contests that are not under State supervision, because they fail to abide by State rules. When entered in local contests only, boys have only local rules and regulations to observe. Last year 373 persons were taken to Washington, D. C., on the Boys' Corn Special. About 200 of this number were winners in the acre contest. The average yield per boy was 85

bushels; by "dads," 35. The highest yield for boy was in Darke County, 139.2 bushels, raised by Dewey Hanes; for girl, 85 bushels in Warren Coun., , by Mary Whitacre. One hundred and nine boys finished the acre-of-wheat contest last July with an average of 35.25 bushels per acre. The 10-year average for the State is 14 bushels per acre. Twenty-five boys in the contest averaged 40 bushels per acre. Earl Bright, the winner, produced 54.61 bushels on 1 acre in Putnam County. Blanks showing all work done, method of cultivation, and fertilizer used were made out and sent to the State department of agriculture at different times during the season in both the corn and the wheat contests. About 200 elementary and high-school girls were entered in the flower growing and lawn-making contest last summer. Some of the winning girls in these contests will secure a free trip to Washington on the Boys' Corn Special the first week in December, this year. Only a few elementary schools outside of the cities and towns are using land in connection with agricultural teaching other than home farm land. Those that have small plats of land at or near the school are using them for growing flowers or for demonstration purposes. Many of the products raised on home land are exhibited in the fall at school and at township and county fairs. Premiums are awarded on best exhibits. Where the plat work is supervised during the summer outside of the cities, it is done by the teacher, superintendent, supervisor of agriculture, representative of Y. M. C. A., an experienced gardener, a representative from the State department of agriculture, or by some local gardener appointed by the local organization. In the cities and towns home and vacant-lot school gardens are preferred in most cases to the school garden at the school. The plan of renting ground in patches containing from 2 to 4 acres for the use of village and city elementary gardeners is growing in favor in this State. This plan makes the supervision of the work in the summer less expensive. In the rural districts the home-farm land is much more satisfactory for contest work. Pupils are required in many schools to make excursions to home-farm lands to observe methods of crop rotation, building plans, plant diseases, results obtained by using different kinds of fertilizers, pure-bred live stock of all kinds, and model dairy barns. The contest movement in the rural districts has been well organized and very generously supported. Business men, bankers, county agricultural societies, farmers, and rural life leaders contributed about $18,000 in 1912, and $35,000 in 1913 toward paying for prizes and trips for winners in these contests. The public-school pupils entered in these contests are about equally divided between the elementary schools and the high schools.

Frank W. Miller, State superintendent of public instruction, states in his official report for 1912, that agricultural instruction in the public schools of Ohio has increased as follows: In 1909, 1,560 pupils studied agriculture; in 1910, there were 1,940; in 1911, 11,608; in 1912, just one year after the State supervisors had begun their work, the number increased to 117,505. Conservative estimates are that the number studying agriculture in the public schools of Ohio at this time (November, 1913) is 175,000.

PENNSYLVANIA.

L. H. Dennis, in charge of agricultural education in State department of education: We do not depend in this State upon the accessibility of a large amount of land in order to carry on the work in agriculture successfully. We must have some land for our school garden work in our elementary schools, and in connection with a few of our high schools we have a small amount of land. In teaching agriculture most efficiently we aim to make use of home-farm land rather than school land, and it is along this line that we are developing the teaching of agriculture in this State at the present time.

RHODE ISLAND.

A. E. Stene: School garden work is conducted in connection with several elementary schools. Corn-growing contests and home gardens are being conducted on home grounds.

SOUTH CAROLINA.

J. E. Swearingen: Most of the county superintendents have organized boys' corn clubs or girls' tomato clubs. A few have agricultural plats in connection with their schools. Hetty S. Brown, principal of the Winthrop farm school, at Rockhill, report creditable work.

SOUTH DAKOTA.

C. G. Lawrence, superintendent of public instruction: We use home-farm land in teaching agriculture in elementary schools. This is done by instruction given in connection with boys' and girls' agricultural clubs. Corn and all farm crops are raised by these club members.

TENNESSEE.

A. C. Monahan, United States Bureau of Education: The Farragut School, located at Concord, is on a 12-acre lot. A large part of this is used for agricultural purposes. The same demonstration plats are used for the high school as for the grades. The aim of the demonstration plat is to show the farmer and the pupil in the agricultural course how to bring the soil from a state of low fertility to a state of high fertility in the shortest possible time. The plats are used for demonstration work, and not for experimental purposes. One field is used as a home garden. The principal's garden consists of 1 acre of ground and is planned as a model for the busy farmer. The work has been so successful that 8 acres of land adjoining the school lot have been rented to conduct further demonstrations. The Bureau of Education, at Washington, can furnish further details on the work done at this school.

VERMONT.

Mason S. Stone, State superintendent of education: I wish to say that every union superintendent in the State, through some one or more of his teachers, is making use of land in education.

VIRGINIA.

R. C. Stearnes, State superintendent of public instruction: We have agricultural high schools in each of the congressional districts; the sixth district has two. These schools are using from 10 to 30 acres of land near the building for practical demonstrations. Half of the counties have corn clubs, which are operated in connection with the school work. More than 30 of the counties have canning clubs organized among the girls. The number of children taking agriculture is 6,592.

A. C. Monahan, United States Bureau of Education: A small school located in Alexandria County has been teaching agriculture in a successful way during the last summer. Arrangements were made for home gardens of from $\frac{1}{10}$ acre to half acre in size. An expert market gardener living in the vicinity was secured to instruct the boys and girls in their home gardens. He spends the equivalent of one day a week visiting the gardens and showing the pupils how the work should be done. There are two teachers in the school, and one teaches agriculture. She visits the gardens and is paid during the summer for one day a week to keep a careful watch over the gardens and to see that the children do the work as instructed by the gardener. The garden work is made a basis for part of the work in English, arithmetic, geography, and language. The gardens are on a commercial basis and the children are caring for them in order to get as much money as possible for their labor. This, however, does not make the garden work any less educational.

WASHINGTON.

Mrs. Josephine Preston, State superintendent of public instruction: A series of community center fairs were carried on last fall. The products raised were cultivated on home-farm land.

WEST VIRGINIA.

M. P. Shawkey, State superintendent of free schools: Mr. J. F. Marsh furnishes me the following report: Five thousand boys and girls are doing club work on home-farm land in connection with corn and tomato growing contests. In Moundsville, a town of 10,000 population, 6,500 packages of seeds were distributed among 1,000 boys and girls. All were delighted with the results obtained in these gardens. The county and district superintendents of schools in the State are doing much to extend the movement to all parts of the State, and all educational institutions are cooperating in the work.

WISCONSIN.

C. P. Carey, State superintendent of public instruction: Many counties have the practice of having children grow products at home and exhibit them in the fall either at the local school house or at the county fair. Many county fair boards have established school children's departments. Considerable numbers of elementary school children are entered in corn contests. We like the contest idea better than the school garden idea. We do not have many school gardens in this State operated in connection with one-room rural elementary schools. In a few of the villages and cities school gardens have been established.

K. L. Hatch: The following list of teachers of county schools of agriculture are all using land in connection with their instruction: A. A. Johnson, Wauwatosa; Theodore Sezauer, Menomonie; D. S. Bullock, Marinette; T. H. Campion, Onalaska; Prof. Patterson, Winneconne; J. F. Kadonsky, Wausau; J. A. James, Rochester. The following list of county representatives are making use of land in their demonstration work: E. L. Luther, Rhinelander; C. R. Ingalls, Eau Claire; F. D. Otis, Barron; Grifford Richards, Phillips. The following list of high-school teachers make some use of land in their high-school teaching: W. W. Clark, Ellsworth; G. O. Marsh, Omro; W. G. Pope, Plymouth; W. E. Maddock, Superior.

DISTRICT OF COLUMBIA.

Susan Sipe, supervisor of gardens: Our pupils give one hour and a half in a week to gardening work in the spring. They raise a crop of vegetables and a border of flowers. They keep records of work done. We obtain seeds from the Department of Agriculture. Graduates from the normal school in this city supervise summer work three mornings a week at $1 a morning. Our plats are 8 by 15 feet. The products raised belong to the gardeners who grow them. This work promotes better home gardening and gives our pupils an opportunity to raise material to be used in the schools for nature study work. We feel that the home gardens have produced a deeper interest in school work on the part of the parents. I have no preference between the home garden and the garden at the school. The community garden [illegible] the school permits closer supervision.

PORTO RICO.

T. Frank Parker, supervisor of agricultural education: With the opening of the schools last September, 1,070 schools began practical garden work in connection with their schools. This number includes 70 graded schools. Home gardens are urged, and in some of the districts much success is already attained. We have 42 special teachers of agriculture who are looking after the school work of the 42 districts. As a rule, land for gardens is rented or the use of it donated. In the rural districts it is mostly all donated.

PLANS GENERALLY APPROVED.

The additional drift of the replies may be roughly summed up as follows:

1. That there should be better supervision over home-plat work, whether it is done in connection with home gardens and vacant-lot gardens or with general field contest work.

2. That where land is used at or near the school, it should be for demonstrations rather than for experiments.

3. That schools training teachers to teach agriculture or school garden work should give more attention to the use of land in their course of study for such teachers.

4. That simple records of work done should be kept where land is cultivated.

5. That if pupils cultivating land are required to keep an account of all work done and money spent, care should be exercised lest these records become too technical. If such records are too technical, pupils lose interest in the project undertaken.

6. That if land is used by schools having all the grades, the pupils of the upper grammar grades should cooperate with the high-school pupils in all the elementary demonstration projects.

7. That home gardens and vacant-lot gardens are more popular than gardens at the school, if they are under similar management and supervision.

APPENDIXES.

APPENDIX A.

1913 Summer Practicum (Home Project) Work of The Univeristy of Minnesota. Northwest School of Agriculture, Crookston, Minn.

C. G. SELVIG, SUPERINTENDENT.

All students will be required to do summer practicum work during both summers of their course.

All practicum topics must be approved by the station council.

Two hours of credit will be given for each summer's practicum work that is done satisfactorily and reported properly.

If for any reason practicums can not be carried on during the summer months, the students will be required to do practicum work during the school months in addition to the regular school work.

Honorable mention with certificates will be given for the best work in practicums, which will be reported and published in the school circular.

LIST OF SUMMER PRACTICUMS, 1913, CROOKSTON, MINN.

Each student will select one or more projects from this list. A full report will be required covering the work to be done. The blank will be furnished by the registrar. The work will be outlined by the head of the department wherein the summer practicum project comes.

Projects.	Number registered.
1. Dairy herd record of at least six cows for five months	1
2. Growing and feeding forage crops for pigs	2
3. Finding cost of keeping all horses on the farm during six months' period	5
4. Record of farm poultry flock, including egg production, incubation, and brooding	3
5. Different methods of preparing seed bed on home farm	3
6. Corn work: One acre ear-to-row test	5
7. Historical 1913 field crop map of an area of not less than 10 square miles, limited to settled communities only	3
8. Variety crop work, including at least three varieties of one kind of pedigreed seed grain	1
9. Two ¼-acre plats of alfalfa	6
10. An acre or less of vegetable garden work	2
11. An acre or less of potato work, including treating and spraying	12

SUMMER PRACTICUM PROJECT, 1913, NO. 1.

Record for .....

Dairy herd record of at least six cows for five months.

Date.	Cow No. 1.	Cow No. 2.	Cow No. 3.	Cow No. 4.	Cow No. 5.	Cow No. 6.
....., a. m.						
....., p. m.						
....., a. m.						
....., p. m.						
....., a. m.						
....., p. m.						
Total						
Per day						
Per cent fat						
Total fat						

Horse feed record for month of ....., 1913.

Name.	Age.	Sex.	Time bred.	Pounds per day.			Total pounds for month.			Days pasture.	Cost.
				Hay.	Grain.	Other.	Hay.	Grain.	Other.		
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

NOTE: State kind of hay, grain, and other feed used; also kind of pasture. Tell the nature of the work done by each horse during the month.

SUMMER PRACTICUM PROJECT, 1913, NO. 4.

Record of farm poultry flock.

Keep daily record of number of hens kept; number of eggs laid; amount of feed given; kind of feed given; market price of eggs sold; breed of fowl; whether pure-bred or otherwise.

SUMMER PRACTICUM PROJECT, 1913, NO. 5.

Preparation seed bed.

Name of student, ... Date, ...
Post-office address, ...
Project, ...
Description of field:
Size of field: Length.....; width,.....; area,.....
Kind of top soil to 8 inches.....
Kind of subsoil to 24 inches.....
Contour: Level, undulating, or hilly.....
Direction of slope, if any.....
How drained.....
Crop history—
1908.....
1909.....
1910.....
1911.....
1912.....

Field operations on area since harvest 1912:

Plowing—

	Time.	Depth.	Kind of plow.
First	.....	.....	.....
Second	.....	.....	.....

Disking—

	Time.	Manner.	Kind of machine.
First	.....	.....	.....
Second	.....	.....	.....

Harrowing—

	Time.	Manner.	Kind of machine.
First	.....	.....	.....
Second	.....	.....	.....
Third	.....	.....	.....

Rolling or packing—

Time.	Manner.	Kind of machine.
.....	.....	.....

Fertilizing—

	Kind.	Amount.	Time and method of application.
First	.....	.....	.....
Second	.....	.....	.....

Field operations on area since harvest 1912—Continued.

Manuring—

	Kind.	Amount.	Time and method of application.
First			
Second			

SUMMER PRACTICUM PROJECT, 1913. NO. 6.

Corn work: Ear-to-row test.

Work seed bed thoroughly with disk and harrow before planting. Plant in rows, preferably 40 inches apart. Each row should have the same number as the ear from which the corn is planted. If more than one row is planted from one ear of corn, several rows planted from other ears should intervene. The rows from ear No. 1 may be numbered (1), (1′), (1″); and from No. 2, (2), (2′), (2″). The corn should be planted one kernel to each hill, and the hills be placed 20 to 24 inches apart; if two or three kernels be planted to the hill, the hills should be at least 36 inches apart.

Plant rather deep, and harrow lightly every few days until the corn is up 2 or 3 inches, after which keep good dust mulch. When tassels appear, and before pollen is allowed to form, detassel all undesirable plants in each row and take notes on number of such plants untasseled. Also take notes on amount of "suckering" in each row; leafiness, not including suckers; average height of stalks in each row when tassels are fully developed; and number of ears per 100 stalks. Also make note of number of stalks in each row for reference when calculating yield. Each row must be harvested separately, whether selected early for seed or husked later. Weigh (in the ear) yield from each row, and calculate relative crop as per number of stalks in each row. Keep corn from detasseled plants separate from those tasseled. Make map of field, drawn to a definite scale, and keep full notes of all operations in a notebook kept for that purpose and for future reference.

Keep record in your notebook of each row as follows:

Number of row .....
Number of stalks in row .....
Average number of leaves per plant—each .....
Average height of stalks when full grown .....
Number stalks detasseled .....
Number of ears per 100 stalks .....
Tendency to "suckering" .....
Weight of corn in ear per row .....
Percentage of ripe corn .....
Note usual number of rows of kernels on ear .....
Other characteristics .....
Remarks and conclusions, if any .....

[redacted]orted by.....

Date.....

SUMMER PRACTICUM PROJECT, 1913, NO. 8.

Observations on grain varieties.

Kind of crop.....	Variety name.....
Seeding: Time, ...; rate, ...; method, ...	
Time of heading.....	Time of ripening.....
Rust.....	Smut, loose.....; closed.....
Strength of straw or percentage of lodging.....	
Average length of plants.....	Average length of head.....
Time of cutting.....	Time of stacking.....
Time of threshing.....	Total yield.....
Rate of yield per acre.....	Weight per bushel.....
Market grade.....	Remarks and conclusions.....

Reported by.....

Date .....

SUMMER PRACTICUM PROJECT, 1913, NO. 9.

Alfalfa growing—Two or more ¼-acre plats of alfalfa.

Select uniform, rich, well-drained plat of land. Land that was in potatoes or corn last year, or land that has been manured lately and plowed early last fall, is preferred. The alfalfa favors a firm seed bed, but an open subsoil. Heavy clay land should be plowed deep the year previous to planting the alfalfa. If no manured land can be had, the plat selected should be manured and the manure well mixed with the soil by discing. Coarse manures should be avoided. Do not plow the plat in the spring, but disc and harrow well instead. Go over the plat in this way once a week or so until June. The seed bed will then be in good condition, and most of the weed seeds will have germinated and been destroyed.

All varieties should be given uniform conditions of soil and drainage. Soil from an old alfalfa field should be spread across half of each variety plat. This should not be done while the sun is bright. A cloudy day or in the evening is best. The soil should be harrowed at once. Care should be taken not to scatter any of this soil for the inoculation of the alfalfa bacteria on the half of the field not supposed to be thus treated or your experiment as far as inoculation is concerned will be valueless. You may be fortunate enough to have such alfalfa soil in your neighborhood.

The seed should be drilled in at the rate of about 10 pounds an acre and well covered. Clip 2 or 3 inches high with mower several times during the summer. Do not cut later than August 15 this year.

Keep full notes of your operations and of condition of crops. Make careful comparisons between the different varieties under test. This project can be continued next year, for which credits will be given. Data on the comparative yield and hardiness of the varieties can then be had.

SUMMER PRACTICUM PROJECT, 1913, NO. 2.

Alfalfa.

Total area of field.....
(Number and area of plats should be shown by a map to accompany this report.)
Varieties of alfalfa sown.....
Methods of treatment on each plat.....
Time of seeding..... Method of seeding.....
Rate of seed per acre..... Method and amount of inoculation, if any.....
Date of cuttings..... Condition of plats at time of each cutting.....
Remarks on crop with respect to weather, insects, diseases, etc.....
Condition of growth at end of growing season of each plat with respect to the other plats.....
Note any further treatment, if made, such as top dressing with manure, discing, dragging, pasturing.....
Other remarks:
.....
.....

Signed.....
Address.....

SUMMER PRACTICUM PROJECT, 1913, NO. 10.

An acre or less of vegetable-garden work.

The garden should be 1 acre in extent or any amount approved by the department. The planting list should include at least 17 kinds (not varieties) of vegetables. The vegetables should be planted in a logical order, and the planting plan should be approved before the vegetables are planted.

[Report No. 1 due June 1.]

Location of garden, ... Kind of soil. .....
Cost of plowing and preparation, ... Fall or spring plowing, ...
Cost of fertilizing, ... Cost of seeds, ... Cost of planting to date, ...
Kind of seeds (12) and date of planting each. Cost of cultivation to date, ...
Remarks: (Date of germination of seeds, weather, frosts, etc.)

[Report No. 2 due .....]

Cost of cultivation to date, ...
Crops harvested to date, value and quantity of each, ...
Note on presence of injurious insects, control, and diseases, ...
General remarks and notes on growth and date of maturity of different kinds of vegetables, ...

[Final report due October 10, on separate sheet.]

Summary of cost of entire garden under headings of plowing, cultivation, weeding, spraying, and harvesting.
Itemized quantity and value of each crop, and total value of crops grown.
General description, including figures given, method of management, comparative value of the different crops, and conclusions derived from summer's work.

SUMMER PRACTICUM PROJECT, 1913, NO. 11.

Potato culture test.

The test should cover an acre of ground divided into four ¼-acre plats. Seed for plats 1, 2, and 3 must be treated with formalin for scab; plat 4 should be run as a check plat.

Plats 1 and 2 are to be used for cultivation plats. Plat 1: Blind plow after planting; harrow with harrow teeth slanting as soon as potatoes come through the ground. Cultivate three times with cultivator after potatoes are up.

Plat 2: Cultivate three times only. Begin when rows can be seen.

Plat 3: Harrow as soon as potatoes show above ground. Cultivate three times with cultivator.

Plat 4: Untreated seed; give same cultivation as No. 3.

All plats should be sprayed with Paris green if potato beetles appear.

[Report due June 1.]

Variety used.....	Cost of treating seed per plat.....
Date of planting.....	Per cent of scab on seed.....
Cost of seed.....	Dimensions of plats.....
Cost of preparation of land.....	Conditions of seed.....
Cost of planting.....	Condition of soil at planting time.....
Cost of cultivation to date.....	Remarks:

[Report due July 1.]

Number and cost of cultivations to date..	Cost of spraying to date, if any.....
Diseases present, if any.....	General remarks:
Insects present, if any.....	

[Report due October 12.]

Give summary of the cost of production for each plat, including seed, spraying, planting, cultivation, plowing, and harvesting.
Give total yields of each plat.....
Give the percentage of scab in plats 3 and 4.....
Conclusions.

APPENDIX B.

Students' Reports on 1912 and 1913 Summer Practicum Work at Crookston, Minn.

(Typical reports of summer practicum work, 1912.)

RICHARD NELSON. *Comparison between rape and peas and oats as summer feed for hogs.*—One-half acre in each field; four hogs in each field. Sow 1½ bushels, each, oats and peas per acre, and 12 pounds rape. To determine on which field the hogs will do best, and which will be cheaper. Result: Oats and peas proved to be the best in 1912; drought affected the rape.

WILLIAM LINDQUIST. (1) *Study of a few common plant diseases and treatment.*—Studied smut potato scab. Treated all wheat for smut. Used hot-water system for loose smut. Studied the root rot diseases during August.

(2) *Cost of field operations, including results.*—Noticed conservation of moisture due to careful cultivation. Took rough-soil moisture tests. Noticed immediate effects of application of farmyard manure.

(3) *Testing of home farm dairy herd.*—Balancing the ration; provision of suitable summer and winter feed.

NORRIS JOHNSON. (1) *Rate of seeding wheat, using 45 pounds, 60 pounds, 75 pounds and 90 pounds to the acre.*—Greatest return from rate of 90 pounds. Difference in value of yield was $5.67 in favor of the highest rate per acre. This yield was for one year only and under fairly uniform conditions.

(2) *Rate of seeding oats, using 48 pounds, 64 pounds, 80 pounds, and 96 pounds to the acre.*—Greatest return from the highest rate.

OSCAR LEE. *Growing alfalfa.*—Notes on preparation of seed bed; on seed used; on care during growing season; and on the stand secured.

HERMAN LEE. (1) *Corn work.—Ear-to-row test.*—Preparation of soil; selection and testing of seed; cultivation, and measuring results.

(2) *Alfalfa growing.*

(Reports of summer practicum work, 1913.)

GROWING THREE ¼-ACRE PLATS OF ALFALFA.

Alfalfa was sown June 2. On July 20 alfalfa was clipped about 3 inches from the ground; many weeds. Clippings were left on the ground. Alfalfa grew much thicker after the cutting, as all the seeds did not germinate at first. The second clipping was made August 29. This time there were not many weeds; the alfalfa was about 8 inches high.

I could not see any difference where ground was inoculated and where it was not. All three varieties grew just alike, although I did not weigh the yields to determine this accurately. On October 6 the alfalfa was about 8 inches high, was clean, and had a good thick stand.

Northwest School of Agriculture, 1914.

ALFRED HVIDSTEN,
Stephen, Minn.

ALFALFA EXPERIMENT, VARIETY TEST.

Size of field: Three ¼-acre fields. Kind of top soil to 8 inches, black loam. Kind of subsoil to 24 inches, clay. Contour of land, level. Drained by open ditch.

Crop history: 1908, wheat; 1909, barley; 1910, summer fallow; 1911, wheat cut for hay; 1912, barley.

Field operations: Plowed 4 to 5 inches on September 17, 1912, with Emerson medium short-turn moldboard. Disked on April 29, May 15, June 2, with Keystone single disk. Harrowed on June 2 both ways with wooden harrow. Manured on June 2, 5 loads on a medium-sized manure spreader, rotted manure; applied before disking.

Northwest School of Agriculture, 1914.

ALFRED HVIDSTEN,
Stephen, Minn.

GREEN PASTURAGE FOR HOGS.

I sowed a variety of grains—barley and rape; oats and rape; rye; oats and barley; rye and rape; and rape alone.

The crop that offered the best pasturage and that the hogs seemed to like best was barley and rape during midsummer. Later in the fall, rye and rape seemed to be preferred, as it lasted longer. The rye used was winter rye, which the slight fall frosts did not injure; it was all the better pasture during late fall.

The hogs liked the clear rape while it was small and tender, but as it grew coarse and tough later it was not liked as well as the barley.

Northwest School of Agriculture, 1914.

LEONARD STORY,
East Grand Forks, Minn.

POTATO CULTURE TEST.

(Report June 1.)

Variety used: Early Ohio. Date of planting, May 15 to 18. Cost of seed, $4.50; cost of preparation of land, $7.25; cost of planting, $8.25; cost of treating seed per plat, 14 cents.

Per cent of scab on seed, 6 per cent; size of plats, four ½-acre. Condition of seed, good; condition of soil at planting, land was plowed shallow last fall, manured, and dragged early this spring. When it was well grown up it was plowed again 7 inches deep, just before planting. The soil is deep black loam; land high and well drained.

(Report July 1.)

Number and cost of cultivations to date: One cultivation June 20, $2.75.

(Report September 1.)

Time of maturity of crop, August 15.

Remarks: The check plat seemed to mature a little earlier than the blind plowing, although it was planted about the same depth; was more even. The check plat was about one week earlier in blossoming. There seems to be a fair yield, although the crop has not been dug.

(Report October 12.)

Summary of cost of production for each plat, including seed, plowing, planting, cultivating, spraying, and harvesting. Each plat covers ½ acre of ground.

	Plat No. 1.	Plat No. 2.	Plat No. 3.	Plat No. 4.
Seed	$1.50	$1.00	$1.00	$1.00
Plowing	2.00	2.00	2.00	1.25
Planting	2.06	2.07	2.06	2.07
Cultivating	2.06	2.06	2.06	2.06
Spraying	.30	.30	.30	.30
Harvesting	4.25	4.25	4.25	2.25
Total cost	12.17	11.68	11.67	9.93
Yield.....bushels	62	58	56	51
Per cent of scab			1	1

Northwest School of Agriculture, 1914.

JOHN JACOBSON,
Stephen, Minn.

APPENDIX C.

Use of Land by High Schools Teaching Agriculture. Returns for School Year 1911–12.

Please send returns by November 1, 1913. Returns earnestly desired.

1. High school teaching agriculture, name..... Location.....
2. Agricultural instructor, name.....; Address.....
3. Number of agricultural pupils..... Number of girls taking agriculture.....
4. Agriculture is taught in what year or years of high-school course?.....
   - (1) Number of weeks in school year.....
   - (2) Agriculture, how many weeks per year?.....
   - (3) Agriculture, how many days per week?.....
   - (4) Agriculture, how many periods per day?.....
5. Are agricultural pupils fitted for college?.....
   Or fitted primarily for farming?.....
6. How many agricultural pupils live at home during school year?.....
   - (1) Number of nonresident or boarding agricultural pupils.....
7. Is agricultural production on home farm land or on other land apart from the school premises required?.....
   - (1) Number working such land.....
   - (2) Area, in acre terms, cultivated by each.....
   - (3) Does the pupil keep strict accounts?.....
   - (4) Who has the profit, parent or pupil?.....
   - (5) Highest net profit this year.....
     - (a) Additional amount paid self for labor.....
   - (6) Commonest profit.....
   - (7) Does the agricultural instructor supervise this home farm productive work?.....
     - (a) Supervises how often during term-time?.....
     - (b) How often in summer?.....
8. Has the high school productive farm land?..... How many acres?.....
   - (1) Are agricultural pupils required to cultivate it?.....
   - (2) Primarily for whose profit, that of school or pupil?.....
   - (3) Do pupils work as a group or gang?.....
   - (4) Do pupils work individual plats?.....
   - (5) If so, size of plats in acre terms?.....
   - (6) Profit of school this year.....
   - (7) Profit per pupil.....
9. What area, if any, is devoted to demonstration plats?.....
   Size of plats..... Showing what?.....
10. Does agricultural instructor teach nonagricultural subjects?.....
    - (1) If so, what?.....
    - (2) (a) How many periods per week for agriculture?.....
      - (b) How many for nonagricultural subjects?.....
11. Proportion of time given to general study of agriculture.....
12. Proportion of time given to agricultural science as directly applicable to the productive enterprises undertaken by the pupils at home or at the school.....
13. Remarks.....

(Speak of features which have given you the best practical and educational results.)

APPENDIX D.

The Cooperative Use of Equipment and Illustrative Material in Teaching Agriculture.

By F. W. Howe, Syracuse, N. Y.

The committee on the cooperative use of illustrative material in teaching agriculture reported progress in their investigation and recommended a division of their subject into agricultural moving pictures and laboratory apparatus. The latter topic was assigned to a new committee, with the understanding that the original committee would continue with its more limited inquiry. It was found that a number of American universities, notably the University of Minnesota, have installed apparatus for producing and demonstrating moving pictures for teaching purposes. A reel illustrating "Dairying in Minnesota" has been used at the State fair, and has also been exhibited at moving-picture houses in various parts of the State. Another reel, entitled "From the egg to the butterfly," has been similarly used. "Farming with dynamite" and "Clearing land" have also been borrowed for use from certain commercial companies. The extension department expects to extend greatly this line of work. It is reported that the Oklahoma Agricultural College has used extensively in that State a reel illustrating the daily routine work of the college. Syracuse University, through its division of agriculture and school of photography, is definitely planning the manufacture of one or more reels of pictures illustrating agricultural operations on the university farm, these reels to be interchanged for any produced during the year by other agricultural colleges.

The committee expects, in connection with its next report, to demonstrate several of these reels at the next meeting of the association.

APPENDIX E.

Massachusetts State-aided vocational agricultural education—Examples of the income of pupils from farm work during attendance at school in 1913.

Location of school or department.	Pupil's age (years).	Title and scope of project or projects.	Pupil's project income.			Other family income from pupil's project.			Cash or credit received by pupil from farm work during project period.			
			Net profit.	Paid self for labor.	Total.	Labor, man or horse.	Rent, seed, etc.	Total.	At home.	Away from home.	His own project.	Total.
	2	3	4	5	6	7	8	9	10	11	12	13
Northampton	17	10 square rods potatoes; 18 square rods popcorn; 12 apple trees.	[1] $90.65 41.40	$12.05	$52.80	$4.90	$15.30	$20.20	$150.00	.....	$52.80	$202.80
Do	16	¼ acre kitchen garden; 19 Rhode Island Reds	43.66	8.00	51.66	.....	1.00	1.00	.....	$155.50	51.66	207.16
Do	16	¼ acre market gardening	11.00	4.27	15.27	.....	1.00	1.00	.....	217.00	15.27	232.27
Do	15	22 Rhode Island Reds; ¼ acre corn	138.47	19.30	157.77	6.20	8.00	14.20	208.00	7.25	157.77	373.02
Do	17	½ acre garden; 26 Wyandottes; 75 barred Rocks; 1 acre corn.	141.07	63.89	204.96	37.23	5.50	42.73	56.20	.....	204.96	261.16
Petersham	15	13 hens; 71 chicks; 130 young apple trees; ½ acre muskmelons.	146.05	77.80	223.85	34.21	12.00	46.21	148.10	.....	223.85	371.95
Do	18	½ acre garden; 34 hens; 110 chicks	60.15	46.00	106.15	4.50	3.15	7.65	84.90	85.00	106.15	276.05
Do	16	Pair O. I. C. swine; ½ acre garden	51.50	51.60	103.10	5.80	15.45	21.25	53.80	1.20	103.10	158.10
Do	15	34 sheep; 24 old apple trees	82.63	11.20	93.83	.....	.....	.....	179.80	9.60	93.83	283.23
Do	16	18 fowls; 82 chicks; 4 grade cows; 336 young apple trees; corn; potatoes; mangels; ½ acre peach trees; 1 acre garden and orchard.	742.02	143.43	867.45	76.44	125.45	201.89	268.30	14.40	867.45	1,150.15
Hadley	15	15 hens; 5 square rods kitchen garden	35.05	18.50	53.55	1.00	2.60	3.60	.....	95.50	53.35	148.85
Do	17	Small kitchen garden	5.74	4.50	10.24	2.50	.56	3.06	40.00	85.65	10.24	135.89
Do	19	5 Holsteins	500.00	45.00	545.00	45.00	250.00	295.00	129.00	5.50	545.00	679.50
Do	16	¼ acre kitchen garden	7.62	10.80	18.42	1.50	2.00	3.50	200.00	1.00	18.42	219.42
Do	17	¼ acre kitchen garden; 1 acre corn	45.30	16.10	61.40	6.85	20.00	26.85	142.00	30.00	61.40	233.40
Northboro	18	½ acre field corn; poultry	[2] 100.85	16.95	117.80	.....	[2] 7.50	7.50	200.00	5.00	117.80	322.80
Do	18	Poultry	[2] 271.25	.....	271.25	.....	.....	.....	388.00	.....	271.25	659.25
Do	18	½ acre garden; poultry	[2] 45.88	45.00	90.88	.....	[2] 29.90	29.90	247.00	.65	90.88	388.53
Do	18	1 acre corn; poultry	69.35	49.25	118.60	.....	.....	.....	322.00	.....	118.60	440.60
Do	15	Poultry	15.40	8.00	23.40	.....	.....	.....	175.00	40.00	23.40	240.40
Harwich	15	16 hens; ½ acre corn; ½ acre beans; ½ acre potatoes; ¼ acre garden; ½ acre garden.	147.85	25.00	172.85	6.00	4.50	10.50	96.00	17.00	172.85	285.85
Do	17	½ acre garden; 18 white Wyandottes	22.00	15.00	37.00	.....	.50	.50	44.00	12.00	37.00	93.00
Do	19	½ acre garden; 145 Rhode Island Reds; ½ acre potatoes.	48.00	27.25	75.25	.....	2.00	2.00	92.00	.....	75.25	167.25
Do	19	½ acre corn; ½ acre potatoes; 1 acre garden; 30 birds, mixed breeds; 150 apple and peach trees.	121.50	51.90	173.40	8.60	16.00	24.60	168.00	30.00	173.40	371.40

Do.	16	45 birds, mixed breeds	185.50	6.92	192.42	12.58	1.15	13.98	256.50	137.50	192.42	586.42
North Boston	15	30 Rhode Island Reds; garden	113.99	27.90	141.89	6.00	14.00	19.00	5.00	15.00	141.89	161.89
Do.	16	18 Rhode Island Reds; garden	56.45	5.05	60.45	1.00	.85	1.85	10.00	160.00	60.45	220.45
Do.	14	10 Rhode Island Reds; garden	49.11	10.00	59.11	1.00	1.50	2.50	206.00	.80	59.11	265.91
Do.	15	¼ acre garden; 1 cow	22.10	19.50	41.60	1.50	45.00	46.50	26.45	140.00	41.60	208.55
Do.	16	40 hens; ¼ acre garden; 2 cows	122.13	35.45	157.58	8.92	13.00	21.92	.....	266.00	157.58	423.58
Totals for 20 pupils			3,423.37	875.56	4,298.93	270.88	597.81	868.79	3,868.55	1,531.55	4,298.73	9,728.08

The cash or credit received by the pupils from farm work done at home included proper valuations put upon so much of the board of the pupils as the parents and instructors would find the pupils had fully and fairly earned.

Estimated.

BULLETIN OF THE BUREAU OF EDUCATION.

[NOTE.—With the exceptions indicated, the documents named below will be sent free of charge upon application to the Commissioner of Education, Washington, D. C. Those marked with an asterisk (*) are no longer available for free distribution, but may be had of the Superintendent of Documents, Government Printing Office, Washington, D. C., upon payment of the price stated. Remittances should be made in coin, currency, or money order. Stamps are not accepted. Documents marked with a dagger (†) are out of print.]

1906.

†No. 1. Education bill of 1906 for England and Wales as it passed the House of Commons. Anna T. Smith.
*No. 2. German views of American education, with particular reference to industrial development. William N. Hailmann. 10 cts.
*No. 3. State school systems: Legislation and judicial decisions relating to public education, Oct. 1, 1904, to Oct. 1, 1906. Edward C. Elliott. 15 cts.

1907.

†No. 1. The continuation school in the United States. Arthur J. Jones.
*No. 2. Agricultural education, including nature study and school gardens. James R. Jewell. 15 cts.
†No. 3. The auxiliary schools of Germany. Six lectures by B. Maennel.
†No. 4. The elimination of pupils from school. Edward L. Thorndike.

1908.

†No. 1. On the training of persons to teach agriculture in the public schools. Liberty H. Bailey.
*No. 2. List of publications of the United States Bureau of Education, 1867–1907. 10 cts.
*No. 3. Bibliography of education for 1907. James Ingersoll Wyer, jr., and Martha L. Phelps. 10 cts.
†No. 4. Music education in the United States; schools and departments of music. Arthur L. Manchester.
*No. 5. Education in Formosa. Julean H. Arnold. 10 cts.
*No. 6. The apprenticeship system in its relation to industrial education. Carroll D. Wright. 15 cts.
*No. 7. State school systems: II. Legislation and judicial decisions relating to public education, Oct. 1, 1906, to Oct. 1, 1908. Edward C. Elliott. 30 cts.
†No. 8. Statistics of State universities and other institutions of higher education partially supported by the State, 1907–8.

1909.

*No. 1. Facilities for study and research in the offices of the United States Government in Washington. Arthur T. Hadley. 10 cts.
No. 2. Admission of Chinese students to American colleges. John Fryer.
*No. 3. Daily meals of school children. Caroline L. Hunt. 10 cts.
†No. 4. The teaching staff of secondary schools in the United States; amount of education, length of experience, salaries. Edward L. Thorndike.
No. 5. Statistics of public, society, and school libraries in 1908.
*No. 6. Instruction in the fine and manual arts in the United States. A statistical monograph. Henry T. Bailey. 15 cts.
No. 7. Index to the Reports of the Commissioner of Education, 1867–1907.
*No. 8. A teacher's professional library. Classified list of 100 titles. 5 cts.
*No. 9. Bibliography of education for 1908–9. 10 cts.
No. 10. Education for efficiency in railroad service. J. Shirley Eaton.
*No. 11. Statistics of State universities and other institutions of higher education partially supported by the State, 1908–9. 5 cts.

1910.

†No. 1. The movement for reform in the teaching of religion in the public schools of Saxony. Arley B. Show.
No. 2. State school systems: III. Legislation and judicial decisions relating to public education, Oct. 1, 1908, to Oct. 1, 1909. Edward C. Elliott.
†No. 3. List of publications of the United States Bureau of Education, 1867–1910.
*No. 4. The biological stations of Europe. Charles A. Kofoid. 30 cts.
*No. 5. American schoolhouses. Fletcher B. Dressler. 75 cts.
†No. 6. Statistics of State universities and other institutions of higher education partially supported by the State, 1909–10.

1911.

*No. 1. Bibliography of science teaching. 5 cts.
*No. 2. Opportunities for graduate study in agriculture in the United States. A. C. Monahan. 5 cts.
*No. 3. Agencies for the improvement of teachers in service. William C. Ruediger. 15 cts.
*No. 4. Report of the commission appointed to study the system of education in the public schools of Baltimore. 10 cts.
*No. 5. Age and grade census of schools and colleges. George D. Strayer. 10 cts.
†No. 6. Graduate work in mathematics in universities and in other institutions of like grade in the United States.
*No. 7. Undergraduate work in mathematics in colleges and universities. 5 cts.
*No. 8. Examinations in mathematics, other than those set by the teacher for his own classes. 5 cts.
No. 9. Mathematics in the technological schools of collegiate grade in the United States.
†No. 10. Bibliography of education for 1909–10.
†No. 11. Bibliography of child study for the years 1908–9.
*No. 12. Training of teachers of elementary and secondary mathematics. 5 cts.
*No. 13. Mathematics in the elementary schools of the United States. 15 cts.
*No. 14. Provision for exceptional children in the public schools. J. H. Van Sickle, Lightner Witmer, and Leonard P. Ayres. 10 cts.
*No. 15. Educational system of China as recently reconstructed. Harry E. King. 15 cts.
*No. 16. Mathematics in the public and private secondary schools of the United States. 15 cts.
†No. 17. List of publications of the United States Bureau of Education, October, 1911.
*No. 18. Teachers' certificates issued under general State laws and regulations. Harlan Updegraff. 20 cts.
No. 19. Statistics of State universities and other institutions of higher education partially supported by the State, 1910–11.

1912.

*No. 1. A course of study for the preparation of rural-school teachers. Fred Mutchler and W. J. Craig. 5 cts.
*No. 2. Mathematics at West Point and Annapolis. 5 cts.
*No. 3. Report of committee on uniform records and reports. 5 cts.
*No. 4. Mathematics in technical secondary schools in the United States. 5 cts.
*No. 5. A study of expenses of city school systems. Harlan Updegraff. 10 cts.
*No. 6. Agricultural education in secondary schools. 10 cts.
*No. 7. Educational status of nursing. M. Adelaide Nutting. 10 cts.
*No. 8. Peace day. Fannie Fern Andrews. [Later publication, 1913, No. 12.] 5 cts.
*No. 9. Country schools for city boys. William S. Myers. 10 cts.
*No. 10. Bibliography of education in agriculture and home economics. 10 cts.
†No. 11. Current educational topics, No. I.
†No. 12. Dutch schools of New Netherland and colonial New York. William H. Kilpatrick.
*No. 13. Influences tending to improve the work of the teacher of mathematics. 5 cts.
*No. 14. Report of the American commissioners of the international commission on the teaching of mathematics. 10 cts.
†No. 15. Current educational topics, No. II.
*No. 16. The reorganized school playground. Henry S. Curtis. 5 cts.
*No. 17. The Montessori system of education. Anna T. Smith. 5 cts.
*No. 18. Teaching language through agriculture and domestic science. M. A. Leiper. 5 cts.
*No. 19. Professional distribution of college and university graduates. Bailey B. Burritt. 10 cts.
*No. 20. Readjustment of a rural high school to the needs of the community. H. A. Brown. 10 cts.
*No. 21. Urban and rural common-school statistics. Harlan Updegraff and William R. Hood. 5 cts.
No. 22. Public and private high schools.
No. 23. Special collections in libraries in the United States. W. Dawson Johnston and Isadore G. Mudge.
*No. 24. Current educational topics, No. III. 5 cts.
†No. 25. List of publications of the United States Bureau of Education, 1912.
†No. 26. Bibliography of child study for the years 1910–1911.
No. 27. History of public-school education in Arkansas. Stephen B. Weeks.
*No. 28. Cultivating school grounds in Wake County, N. C. Zebulon Judd. 5 cts.
No. 29. Bibliography of the teaching of mathematics, 1900–1912. David Eugene Smith and Charles Goldziher.
No. 30. Latin-American universities and special schools. Edgar E. Brandon.
No. 31. Educational directory, 1913.
No. 32. Bibliography of exceptional children and their education. Arthur MacDonald.
†No. 33. Statistics of State universities and other institutions of higher education partially supported by the State, 1912.

1913.

No. 1. Monthly record of current educational publications, January, 1913.
*No. 2. Training courses for rural teachers. A. C. Monahan and R. H. Wright. 5 cts.
*No. 3. The teaching of modern languages in the United States. Charles H. Handschin. 15 cts.
*No. 4. Present standards of higher education in the United States. George E. MacLean. 20 cts.
*No. 5. Monthly record of current educational publications. February, 1913. 5 cts.

*No. 6. Agricultural instruction in high schools. C. H. Robison and F. B. Jenks. 10 cts.
*No. 7. College entrance requirements. Clarence D. Kingsley. 15 cts.
*No. 8. The status of rural education in the United States. A. C. Monahan. 15 cts.
*No. 9. Consular reports on continuation schools in Prussia. 5 cts.
*No. 10. Monthly record of current educational publications, March, 1913. 5 cts.
*No. 11. Monthly record of current educational publications, April, 1913. 5 cts.
*No. 12. The promotion of peace. Fannie Fern Andrews. 10 cts.
*No. 13. Standards and tests for measuring the efficiency of schools or systems of schools. Report of the committee of the National Council of Education. George D. Strayer, chairman. 5 cts.
No. 14. Agricultural instruction in secondary schools.
*No. 15. Monthly record of current educational publications, May, 1913. 5 cts.
*No. 16. Bibliography of medical inspection and health supervision. 15 cts.
*No. 17. A trade school for girls. A preliminary investigation in a typical manufacturing city, Worcester, Mass. 10 cts.
*No. 18. The fifteenth international congress on hygiene and demography. Fletcher B. Dresslar. 10 cts.
*No. 19. German industrial education and its lessons for the United States. Holmes Beckwith. 15 cts.
†No. 20. Illiteracy in the United States.
†No. 21. Monthly record of current educational publications, June, 1913.
*No. 22. Bibliography of industrial, vocational, and trade education. 10 cts.
*No. 23. The Georgia club at the State Normal School, Athens, Ga., for the study of rural sociology. E. C. Branson. 10 cts.
*No. 24. A comparison of public education in Germany and in the United States. Georg Kerschensteiner. 5 cts.
*No. 25. Industrial education in Columbus, Ga. Roland B. Daniel. 5 cts.
*No. 26. Good roads arbor day. Susan B. Sipe. 10 cts.
*No. 27. Prison schools. A. C. Hill. 10 cts.
*No. 28. Expressions on education by American statesman and publicists. 5 cts.
*No. 29. Accredited secondary schools in the United States. Kendric C. Babcock. 10 cts.
*No. 30. Education in the South. 10 cts.
*No. 31. Special features in city school systems. 10 cts.
No. 32. Educational survey of Montgomery County, Md.
†No. 33. Monthly record of current educational publications, September, 1913.
*No. 34. Pension systems in Great Britain. Raymond W. Sies. 10 cts.
*No. 35. A list of books suited to a high-school library. 15 cts.
*No. 36. Report on the work of the Bureau of Education for the natives of Alaska, 1911–12. 10 cts.
No. 37. Monthly record of current educational publications, October, 1913.
†No. 38. Economy of time in education.
No. 39. Elementary industrial school of Cleveland, Ohio. W. N. Hailmann.
*No. 40. The reorganized school playground. Henry S. Curtis. 10 cts.
No. 41. The reorganization of secondary education.
No. 42. An experimental rural school at Winthrop College. H. S. Browne.
*No. 43. Agriculture and rural-life day; material for its observance. Eugene C. Brooks. 10 cts.
*No. 44. Organized health work in schools. E. B. Hoag. 10 cts.
No. 45. Monthly record of current educational publications, November, 1913.
*No. 46. Educational directory, 1913. 15 cts.
*No. 47. Teaching material in Government publications. F. K. Noyes. 10 cts.
*No. 48. School hygiene. W. Carson Ryan, jr. 15 cts.
No. 49. The Farragut School, a Tennessee country-life high school. A. C. Monahan and Adams Phillips.
No. 50. The Fitchburg plan of cooperative industrial education. M. R. McCann.
†No. 51. Education of the immigrant.
*No. 52. Sanitary schoolhouses. Legal requirements in Indiana and Ohio. 5 cts.
No. 53. Monthly record of current educational publications, December, 1913.
No. 54. Consular reports on industrial education in Germany.
No. 55. Legislation and judicial decisions relating to education, October 1, 1909, to October 1, 1912. James C. Boykin and William R. Hood.
*No. 56. Some suggestive features of the Swiss school system. William Knox Tate. 25 cts.
No. 57. Elementary education in England, with special reference to London, Liverpool, and Manchester. I. L. Kandel.
No. 58. Educational system of rural Denmark. Harold W. Foght.
No. 59. Bibliography of education for 1910-11.
No. 60. Statistics of State universities and other institutions of higher education partially supported by the State, 1913-13.

1914.

*No. 1. Monthly record of current educational publications, January, 1914. 5 cts.
No. 2. Compulsory school attendance.
No. 3. Monthly record of current educational publications, February, 1914.
No. 4. The school and the [illegible]. Meyer Bloomfield.

No. 5. The folk high schools of Denmark. L. L. Friend.
No. 6. Kindergartens in the United States.
No. 7. Monthly record of current educational publications, March, 1914.
No. 8. The Massachusetts home-project plan of vocational agricultural education. R. W. Stimson.
No. 9. Monthly record of current educational publications, April, 1914.
No. 10. Physical growth and school progress. B. T. Baldwin.
No. 11. Monthly record of current educational publications, May, 1914.
No. 12. Rural schoolhouses and grounds. F. B. Dresslar.
No. 13. Present status of drawing and art in the elementary and secondary schools of the United States Royal B. Farnum.
No. 14. Vocational guidance.
No. 15. Monthly record of current educational publications. Index.
No. 16. The tangible rewards of teaching. James C. Boykin and Roberta King.
No. 17. Sanitary survey of the schools of Orange County, Va. R. K. Flannagan.
No. 18. The public school system of Gary, Ind. William P. Burris.
No. 19. University extension in the United States. Louis E. Reber.
No. 20. The rural school and hookworm disease. J. A. Ferrell.
No. 21. Monthly record of current educational publications, September, 1914.
No. 22. The Danish folk high schools. H. W. Foght.
No. 23. Some trade schools in Europe. Frank L. Glynn.
No. 24. Danish elementary rural schools. H. W. Foght.
No. 25. Important features in rural school improvement. W. T. Hodges.
No. 26. Monthly record of current educational publications, October, 1914.