

THE UNIVERSITY OF MINNESOTA

GRADUATE SCHOOL

Report
of
Committee on Thesis

The undersigned, acting as a Committee of the Graduate School, have read the accompanying thesis submitted by William Penn Dyer for the degree of Master of Arts.

They approve it as a thesis meeting the requirements of the Graduate School of the University of Minnesota, and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts.

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June 1920

THE UNIVERSITY OF MINNESOTA

GRADUATE SCHOOL

Report

of

Committee on Examination

This is to certify that we the undersigned, as a committee of the Graduate School, have given William Penn Dyer final oral examination for the degree of Master of Arts . We recommend that the degree of Master of Arts be conferred upon the candidate.

Minneapolis, Minnesota

June 1920

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HOME PROJECT WORK
IN AGRICULTURE
SOME PROBLEMS OF ORGANIZATION
AND ADMINISTRATION

A Thesis

Submitted to the Graduate School
of the University of Minnesota

by

William Penn Dyer

in Partial Fulfillment of the
Requirements for the degree of

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HOME PROJECT WORK IN AGRICULTURE

Some Problems of Organization and Administration.

Sources and Objectives.

CHAPTER I.

A. Sources of Information.

1. A questionnaire (copy appended) sent to instructors in Smith-Hughes Departments of Agriculture in thirty states. Where the number of departments was large, a random choice was made. All sections of the United States are represented in this inquiry. Three hundred eight questionnaires were sent out and one hundred sixty-eight were returned with sufficient data to be of value for the study. In many cases questionnaires were returned with notes to the effect that departments had been established so recently that no data were available.

2. Official records and reports in the office of the State Supervisor of Agricultural Education for Minnesota.

(a) Records of project work for seven schools---1917-1918;

(b) Preliminary surveys of farms of pupils enrolled in twenty departments for project work for the year 1918-1919, and forty-one departments for the year 1919-1920.

(c) Preliminary project reports of twenty departments for the year 1918-1919, and forty-one departments for the year 1919-1920, showing projects selected, scope of projects, age of pupil, year in school, etc.

(d) General School Report to the State Supervisor, of project work completed for the year 1918-19 by the pupils in eighteen schools. This report includes financial summaries and stories of individual projects.

(e) Records of Visits to Projects for seventeen schools.

3. Notes taken at official conferences of agricultural instructors of Minnesota.

(a) University Farm, St. Paul, February, 1919;

(b) University Farm, St. Paul, July, 1919;

(c) Sauk Centre, January 30 and 31, 1920;

(d) Fairmont, February 13 and 14, 1920;

(e) Owatonna, March 5 and 6, 1920;

(f) Grand Rapids, April 16 and 17, 1920.

4. Notes taken at conference of supervisors, directors, and teacher-trainers at Chicago Convention of National Society for Vocational Education, February 18-21, 1920.

5. Personal interviews with ten of the twenty instructors in Minnesota departments for the year 1918-1919, and twelve additional instructors for the year 1919-1920.

6. Visits to departments.

(a) Fifteen departments visited prior to inauguration of Smith-Hughes work;

(b) Six departments visited after Smith-Hughes regulations were put into effect.

7. State plans for vocational agriculture.
8. News-letters prepared by state supervisors and teacher-training departments.
9. Bulletins and reports of the Federal Board for Vocational Education.
10. Bulletins and reports of the United States Department of Agriculture.
11. Books, magazines and newspapers.

A bibliography is appended.

B. Reliability of Data.

Returns from the questionnaires are fairly reliable, judging from a comparison of data thus obtained with that secured from official records in Minnesota. A few instructors made no distinction between Smith-Hughes and Smith-Lever project work, especially in the southern states. The data concerning project-study and project-study outlines are not accurate, for the reason that many instructors had come into the work so recently without any previous knowledge of the desirable features of vocational agriculture that they were not prepared to answer the questions, especially in those states where project work had not been a feature of agricultural instruction. Personal interviews with instructors confirms this impression.

The data concerning school credit for project work are also inaccurate, because the question submitted was variously interpreted, despite a belief on the part of the author that it had been clearly framed. Misinterpretation is due again to lack of

knowledge of project requirements, despite excellent instructions from Federal Board and state supervisors.

The writer feels that the data obtained from the office of the State Supervisor of Agricultural Education for Minnesota, thru the kindness of B.M.Gile, are of the greatest value. Such data have been used to the exclusion of data from other sources whenever possible.

C. Limitations of Study.

After carefully considering the data received from the questionnaires, the writer believed that his results would be of greater value by intensified study of Minnesota departments of vocational agriculture, with comparisons of conditions in other states where data warranted such comparisons. It was decided to exclude data from the three special schools of agriculture in Minnesota for the reason that they represented conditions widely differing from those prevailing in high schools, respecting instruction, equipment, supervision, etc.; and also, for the reason that the opinion seems to prevail that the place for successful project work within the meaning and intent of the Smith-Hughes law, lies within the organization of the public high school. The Director of Vocational Education for Minnesota, E.M.Phillips, has made this emphatic statement three times within the hearing of the writer.

The purpose of this study is to discover the prevailing conditions and practices for project work as it has been inaugurated in connection with agricultural instruction in departments of agriculture in high schools of Minnesota. Having discovered the status of project work, it is the purpose of the writer to point out the tendencies for improvement and progress. The organization and ad-

ministration of home-project work and not methods of teaching vocational agriculture is the main theme of this study.

CHAPTER II
DEFINITION OF HOME-PROJECT IN
AGRICULTURE

The word project is thus defined in dictionaries:

"Something projected or mapped out in the mind, as a course of action, a scheme, plan, contrivance, design, device, invention, purpose". Standard Dictionary.

"That which is projected or devised, etc." Century Dictionary.

"That which is projected or designed, something intended or devised, etc." Webster's International Dictionary.

The following definitions of the term project are given as among the best:

"*A school project is a problem, the solution of which results in the projection of some object or knowledge of such value to the worker as to make the labor involved to him worth while". J.A.Randall (Pratt Institute).

"**A Project is a concrete problem outlined sufficiently fully and clearly to make the student for whom it is designed to carry it out". J.A.Drushel, Harris Teachers' College.

"/School-home project is an out of school useful activity that has been carefully outlined and systematized by the school". E.J.Tobin.

* Quoted by Stevenson in School Science and Mathematics, Vol.XIX, page 61.

**Quoted by Stevenson in School Science and Mathematics, Vol.XIX, page 19.

/ Journal of Education, Vol.XC, page 19.

** A pupil may be said to have worked out a project when he has consciously set up a purpose, has made plans to accomplish his purpose, has executed his plans, and has finally measured the results of his work by comparing them with his purpose and plans." Lull.

*** A problematical act carried to completion in its natural setting." Dr.Stevenson.

"/ A reflective act carried on in its natural setting." Dr.Charters.

"/ Any effort toward giving work in school a practical turn called by some a project. Used by some for practicum. In general a project is something mapped out or planned to be done."

Definitions of the term project as applied to vocational education follow:

"# A large problem carried over into action." "A normal life situation." "A project to be worthy of the name should involve skill in many operations, the application of principles and problems of general management." Nolan.

"## The project is a job or unit of productive work, usually of an utilizable or even marketable character, selected and organized as constituting a valuable state in an educational process."

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- * Teaching (Kansas State Normal School), No.45, page 7.
 - ** School Science & Mathematics, Vol.XIX, page 58.
 - / Nolan's Teaching Agriculture, page 131.
 - // Bulletin 346, U.S.Department of Agriculture, page 1.
 - # Nolan's Teaching Agriculture, page 131.
 - ## Teachers College Record, XX: 432, 433.

"* A unit of work which combines productive and educative possibilities and possessing possibilities of repeated performances so as to give skills." Dr. David Snedden.

The following definitions are applied to vocational agriculture:

"** Term used by experiment stations to cover carefully planned investigations in agricultural science covering a considerable period of time, frequently demanding several years for completion."

"/ In Boys' and Girls' Club Work term project carries with it the idea of a program of importance, of some duration, and an expectation of certain tangible and valuable results."

"// Definition for elementary and secondary agriculture:

(1) Plan for work at home covering a season or a more or less extended time. (2) A part of instruction in agriculture in school. (3) A problem more or less new to pupil. (4) Parents and pupil agree with teacher on a plan. (5) Supervision by competent person. (6) Detailed records of time, method, cost, and income. (7) Written report."

"# A farm project is a thing to be done on a farm, which preparing to do it and carrying it out to a successful result, involves a thoroughgoing educational process." R.W. Stimson.

* Teachers College Record XX: 432, 433.

** Bulletin 346, U.S. Department of Agriculture.

/ Same.

// Same.

Vocational Agricultural Education, page 42.

** It is an agricultural enterprise with a definite aim, undertaken by the pupil with full responsibility on his part for the financing of the project and the doing of the work. " Dr. C.A. Prosser.

*** The part of the course performed at home."

*/ The home project is an enterprise undertaken by the boy with full responsibility on his part for both the financing of the project and the doing of the work, altho he may not necessarily do all the work himself."

*/ By project work in Minnesota we mean the application under farm and home conditions of the pupil of as many of the facts and principles studied in class as the various home conditions will permit."

Projects are thus distinguished from practicums:

"An academic exercise consisting of practical work as in the laboratory." Standard Dictionary.

Principles mastered and exercises merely for illustration of such principles." Dr. Stevenson.

The word practicum is a rather broad term, covering the briefer exercises, demonstrations, verifications, and problems, many of which were formerly called experiments; the purpose of which is to acquire skill in a process needed in project work, e.g., pruning a tree, seed-testing."

* Federal Board Bulletin 21, page 6.

** Texas Bulletin 93, 1918.

*/ Arizona Bulletin 1, 1918.

*/ Minnesota Bulletin Vocational Education 1918, page 10.

School Science and Mathematics, XIX; 56.

Federal Board Bulletin 21.

No definition of the term "home-project" in the full sense of the term as applied to vocational agriculture is satisfactory which does not emphasize or imply the following features:

- (1) A carefully made plan,
- (2) A problem new to pupil,
- (3) Executed under normal farm conditions,
- (4) Difficulties anticipated and at least partially solved in advance thru the study of experiences recorded in the best literature available, under guidance of a well-informed instructor.
- (5) A series of jobs, requiring skill, knowledge, and management.
- (6) A cooperative effort for rural social betterment between home and school.

The writer ventures (rather timidly) the following definition:

A home-project in agriculture is a farm enterprise, the problematic character, size, duration, natural setting, and financial possibilities of which prompt a pupil to undertake and complete the same under competent instruction and sympathetic supervision.

CHAPTER III
ENROLLMENT PROBLEMS

(a) How many pupils should an instructor attempt to direct in project work?

In Table 1^{h.2.6} we note that the average number of pupils enrolled for project work in twenty Minnesota high schools for the year 1918-1919 was sixteen, with a range of six to twenty-nine.

In Table 2,^{h.2.7} we find the average enrollment in the high school classes of vocational agriculture of twenty-nine states selected for the study to be thirty-one. This table shows an average of fifteen for Minnesota, the lower average, as compared with table one, being due to the fact that instructors did not report pupils who had enrolled but dropped out.

Table 3^{h.2.8} was prepared from official data to show enrollment of pupils in high school departments of vocational agriculture in other states. Because the official data did not give separate figures for high school departments and special schools, only those states without special schools could be used for comparison with table one. Table 3 shows a range in average enrollment of vocational classes in twenty-six states from eleven to thirty-seven.

Table 4^{h.2.9} shows an average enrollment in forty-one Minnesota high schools of fifteen pupils, with a range of five to thirty-four.

Table 5^{h.2.10} shows the average enrollment of agriculture pupils in Minnesota high schools since the establishment of agricultural departments in the state. The range is from twenty-eight to thirty-six.

Table 6^{h. 31} shows the number of pupils taught agriculture in those Minnesota public schools now maintaining Smith-Hughes departments.

Three schools show an average enrollment less than sixteen for the period preceding definite work in vocational agriculture (1918-1919), the average noted above for vocational agricultural classes; one being a small consolidated school not now (1919-1920) maintaining a department of agriculture. Six schools have average enrollments, previous to 1918-1919, above fifty, four (forty to forty-nine), eight (thirty to thirty-nine), eighteen (twenty to twenty-nine), four (ten to nineteen), one of six pupils. On the other hand, the last column of this table shows no school with an average enrollment of vocational agriculture pupils above thirty-four. Seven averages are ten or below, twelve are eleven to fifteen, twelve are sixteen to twenty, five twenty-one to twenty-five, four above twenty-five. An enrollment of fifteen to twenty of vocational agriculture pupils is very satisfactory. When the number exceeds this limit, the character of the supervisory oversight of the projects is subject to deterioration, as pointed out under Supervision of Home-Projects.

In those states like Minnesota where agriculture has been taught in the high schools for ten years on a non-vocational basis, the attitude of school authorities is liable to be favorable to large enrollment. In fact, keen disappointment is expressed in some districts because of the great falling off in number of students pursuing agricultural courses. One instructor reported, at a recent conference of agricultural instructors, that his superintendent was reluctant (putting it mildly) to advocate the retention

of the agricultural department because the number of pupils had fallen from twenty-nine to twelve; that the superintendent was disposed to think that the large room set aside for the use of the department was a burden upon the district and that it could be put to more profitable use by a kindergarten class.

On the other hand, a board member, at another recent conference, emphatically stated that his district was not concerned chiefly in numbers, but in the quality of service rendered by the department, and that his district felt well repaid for the annual training of six or more boys for the vocation of farming, that he knew no better nor more direct way for the money of the district to be invested for the good of the community than adequate rooms for an agricultural department.

Many school authorities have sought the establishment of agricultural departments with the aid granted by the state to relieve the congestion in the academic classes of the high school. In such schools vocational agriculture is bound to prove unpopular. It is easy for a superintendent to advocate an agricultural department when he can report that the instructor is teaching several high school classes of agriculture, each ranging in enrollment from twenty to forty-five, besides the instruction given to grade pupils, teacher-training cadets, and short course pupils, and the extensive activities in adult extension work.

Vocational agriculture classes, because of the necessity of performing home-project work will never become excessively large. The average high school pupil is jealous of the freedom accorded by the summer vacation. He is free to follow his bent, whether in fishing trips, playing base-ball, taking long auto tours, clerking

in grocery stores, driving delivery wagons, etc. The more serious-minded pupil may see cultural value in an agricultural course and be anxious to pursue it for that reason alone, but when he perceives that the intent of the course is to train for farming, he chooses the academic subject as the means to the end sought in professional or commercial life.

The farm boy has always been reluctant to join agricultural classes in high schools, commercial subjects proving more popular, and even foreign languages showing magnetic influence.

It has been the writer's experience as a city superintendent that considerable persuasion was necessary with the average farm-reared boy to induce him to study "book agriculture", as he termed it. It is the old, old story of the child seeking to get away from the footsteps of the parent, so far as the means of livelihood is concerned, the parent abetting the youthful ambition to break into a calling where labor is less, profits are larger, and social standing more assured.

Some states are disposed to set a limit to the number of pupils for any agricultural instructor to lead in project work; e.g., Massachusetts 20, Minnesota 40. In the opinion of the writer such anxiety is uncalled for at present, because of the great difficulty in many localities of organizing vocational classes. One instructor reports that he visited some of his prospective pupils fourteen times before he was able to land the lasso. Other instructors report strenuous campaigns with discouraging results. One instructor represented himself as forced to use the methods of a salesman to sell his instruction to the farm boys of his community.

This is not to be wondered at when it is recalled how aloof

the average farmer stands from anyone offering to better his methods of tilling the soil or caring for his livestock. Until this traditional attitude changes among adults, no great rush to obtain vocational training in agriculture may be expected. General extension talks by agricultural college specialists have started the ball rolling very slowly, farmers' bulletins and magazines have given a slight impetus to the movement, agricultural college graduates in the roll of farmers have exerted some pressure. But probably no force or power will exceed that coming from the successful projects of the few boys who elect to perform them.

Book training in agriculture has been rightly unpopular. Vocational training in agriculture may be popular when competent instruction and supervision of project work passes over into larger fields, at lower unit costs of production. In other words, farmers may urge their sons to seek vocational training in agriculture when they observe concrete evidence of such training functioning for their neighbors. Until then, instructors are justified in setting traps, casting nets, or swinging harpoons to catch those who flit by the closest, taking courage in the fact that by patience and effort he may in time make a "big catch".

(b) Should pupils who lack high school entrance requirements be enrolled for project work?

Column nine in Table two shows that thirty-two per cent of the pupils enrolled for project work in twenty-nine states lacked high school entrance requirements, while in Minnesota only eleven per cent had such scholastic handicaps. The larger percentage in the states is due in part to the fact that states like

South Carolina began project work in the eighth grade; that others like Nebraska included boys' and girls' club project work in the number of pupils, without eliminating, doubtless, those who were taught agriculture in the graded school for a limited number of periods. Eight states do not show any pupils lacking high school entrance requirements. Yet it is plainly evident that the doors are open to such pupils in the majority of the states.

The Smith-Hughes Law states that vocational training shall be made available to boys and girls who have reached the fourteenth year in age. No scholastic requirement is specified. This means that pupils who have been retarded in school for various reasons and probably have quit school may be enrolled for agricultural instruction. In fact, this is the group in which we have first interest. Finding the ordinary work of the class room dull and uninviting, some have chosen to eliminate themselves voluntarily, to take up the practical pursuit of farming. As the years pass by, they feel their shortcomings in education. With the attractions of a vocational program, such young people may be drawn back to the class room for such education as their life work demands.

To these may be added the involuntary group, those whose lot has been an up-hill-game, so far as education is concerned, who have been forced to weave in their school days with work days, who entered school late in the fall and left early in the spring, and finally dropped out because ashamed to sit alongside their younger brothers in the class room.

The opportunity to do project work as a process of learning must not be regarded as the end-all of vocational agriculture. Project work should be regarded as an excellent means to

the desired end of extending the period of formal education for the handicapped farm boy. He needs more reading, more language work, more spelling, more farm accounting. He must be trained as a social factor, thru courses in rural sociology, community civics, and rural economics. Vocational departments of agriculture should be life-saving stations, rescuing the thousands of boys on farms who would otherwise flounder in the sea of ignorance, prejudice, and unrest.

But the enrollment of such retarded pupils makes a difficult administrative problem. Shall such pupils be placed in regular classes for instruction in English, arithmetic, etc.? Or, shall separate classes be organized for them? Vocational agriculture has no new problem of great consequence where all pupils enter the high school under the same requirements at the beginning of the school year and remain until the close of the school. No extra classes are necessary under such circumstances, except those directly related to agriculture. But this special group of retarded boys deserves special attention. They would become easily discouraged in the regular English classes. Their individual needs must be discovered and individual instruction must be given, for awhile at least. They must be made to feel that they are getting just what they came to school for, and that every stone is being rolled away from their pathway that will hinder their progress.

One superintendent reports that he has an excellent English teacher who delights in working with farm boys on simple composition exercises; that he has placed several boys in the grade classes where they receive special attention. In some instances the agricultural instructor is teaching English or arithmetic classes, and even some superintendents have manifested their interest in the

situation by tutoring boys until they gained sufficient confidence and apperceptive basis to enter the regular classes.

It is not easy to welcome such comundrums to a school, if the difficulties that are liable to arise are allowed to obscure the vision of rejuvenated, revitalized, redirected farm life, made possible by a liberal policy on the part of the school authorities toward the proper education of farm boys.

One school congratulated itself on its splendid showing of a large class in vocational agriculture, all fully prepared to perform the regular high school work. But the instructor admitted that he could easily have secured twelve or more boys for the department who lacked high school entrance requirements, but that he felt his first obligation was to the group prepared for training to undertake higher education. He is not alone in this feeling. It is the prevailing attitude. No special effort has been made to get the "needy". There are notable exceptions in Minnesota, at least. One instructor brought in, thru a strenuous campaign, thirteen boys who had dropped out of school.

(c) Shall the urban pupil be enrolled for project work? If so, on what terms?

Table one^{h.25} shows that thirty-five per cent of the pupils enrolled for project work in Minnesota schools have urban residence, that is, live within the corporate limits of villages or cities. Table Two^{h.27} shows that sixty-four per cent of pupils in the twenty-nine states live on farms, hence that thirty-six per cent do not live on farms. For Minnesota the figures are sixty-six per cent and thirty-four per cent, a close correspondence to conditions shown in Table one.

Table Four shows that in Minnesota, at least, the tendency is to weed out the urban pupils, twenty per cent of the pupils for the year 1919-1920 being classed as urban. Three out of twenty schools in Minnesota did not enroll urban pupils for the year 1918-1919. Eleven out of forty-one in 1919-1920 did not enroll urban pupils. In 1918-1919 the number of urban pupils exceeded the number of rural pupils in five schools (out of twenty). In 1919-1920, the number of urban pupils exceeded the number of rural pupils in two schools (out of forty-one).

Table 28, p. 120 shows that thirty-five per cent of the urban pupils failed to complete their projects, as compared with twenty-nine per cent for rural pupils.

In view of what has been said about the size of classes the temptation of school authorities is to boost the enrollment of classes by admitting urban pupils. But do they belong there? Can they answer the qualifications of successful project workers and furnish the required setting for project work? If the schools are tending toward exclusion of urban pupils as strongly thruout the United States as in Minnesota, it is only a question of time, as project work becomes firmly established, that not to exceed fifteen per cent of the project workers in agriculture will be listed as urban.

This is as it should be. Vocational training is such only as it actually prepares the individual for useful occupations. No doubt town boys will continue to find productive work in agriculture intensely interesting and financially profitable. No doubt they will receive a social viewpoint that will prove exceedingly valuable to them and to society in general. Instruction in agricul-

ture is highly desirable for all classes of society. Its liberalizing influence is of the highest importance. Bankers, merchants, teachers, ministers and tradesmen need the broad horizon of sympathy for and understanding of the problems arising from the tillage of the soil

But such orientation can be given thru general courses in agriculture, rural economics and rural sociology. Project work, on the scale undertaken on town lots and school plots, will never revolutionize methods of farming nor develop skilled, progressive farmers. Vocational training in agriculture is for rural boys. Industrial training is primarily for town boys.

Probably fifteen per cent of the boys on the farms would be better satisfied and render better service in some trade or industry. Such boys need and should have industrial training. On the other hand, fifteen per cent of town boys may be better satisfied and render better service on the farm. These boys should be vocationally trained. This means that every urban boy who seeks to do project work in agriculture should be quizzed carefully regarding his motives. If his interest appears genuine, if, in other words, he means business, he should be encouraged to undertake project work. If he is willing to work on a farm for an entire season, where he will have the opportunity to keep farm records, and to put into practice some of the principles learned in the agriculture classroom, it will pay to give him careful supervision, with the strong probability that his choice of farming as a life career will offset the choice of some farm boy to enter city life. But seldom will backyard gardening, small poultry flocks, and hot-house pigs give sufficient insight into the possibilities of farming as a profitable

venture, as worthy of the keenest intellect, as affording enjoyment and satisfaction. If town boys seek to do big things on farms, not little things within incorporated areas, they should not be barred from enrollment for project work.

(d) Shall girls be enrolled for project work, and on what terms?

From Tables one and four we learn that in 1918-1919, nine per cent, and in 1919-1920 only two and two tenths per cent of the enrollment for project work was due to the presence of girls.

From Table two we see that in some of the states the number of girls doing project work in agriculture nearly equals that of the boys---forty-three per cent in Tennessee, forty-one per cent in Kentucky. This is explained by referring to the data from the questionnaires which show that, in seven departments out of twenty-two in Kentucky with one hundred and ninety-five pupils enrolled, one hundred and thirty are doing boys' and girls' club work.

Other states with comparatively high percentages of girls enrolled, like West Virginia, thirty per cent, Illinois, eleven per cent, South Dakota twenty-seven per cent, Colorado nineteen per cent, New Mexico twenty-six per cent, Nebraska eleven per cent. Boys' and Girls' club work is apparently the drawing card for girls. On the other hand, in those states having only boys in vocational agriculture classes like Louisiana, Iowa, and Montana, Boys' and Girls' club work is a prominent factor in project work. It cannot be said that club work is sure to draw girls into Smith-Hughes project work. The presence of girls in vocational agriculture classes will depend upon the attitude of supervising authorities and local sentiment.

The tables for Minnesota show that a great falling off in the percentage of girls has taken place. This is due to the attitude of the state supervisor, who feels that agricultural instruction is primarily for boys, that the girl who should be vocationally trained for farming is the rare exception.

Where the agricultural instructor has made any effort to secure boys for his classes, girls are not in evidence. This simply means that the local authorities must not accept all those who seek to enroll for project work; the character and scope of the work required must be such that only boys will be able to do it. In other words, project work must be more than club work (in the meaning of Smith-Lever Act), must approach actual units of farm work. If girls choose to do project work on this large basis, it should be their privilege to receive instruction and supervision for the same. But no one doing project work on a small basis, whether girl or boy, should be admitted into Smith-Hughes classes. There is a place for this project work on a limited basis in connection with instruction given in agriculture in the graded school to pupils under fourteen years of age. But no one can successfully contend that local, state and Federal funds should be expended to train any large group of individuals for the farming occupation who will not ultimately follow that occupation. Farm girls should receive agricultural instruction while in the grades, but not in the high school. They belong in the home economics classes.

(e) In what year of the high school should pupils be enrolled for project work?

Table one shows that in Minnesota for the year 1918-1919, four per cent of the enrollment was eighth graders, forty-three and

four tenths per cent twelfth graders, and six and two tenths per cent unclassified or special pupils.

An examination of the records of projects reveals that sixty-seven per cent of eighth graders failed to complete their projects, twenty-seven per cent of ninth graders, twenty-six per cent of tenth graders, twenty-six percent of eleventh graders, and forty-six per cent of twelfth graders. It is clear that project work on Smith-Hughes basis should not be attempted by pupils in the grades. On the other hand, project work for seniors in high school is not a success, for the reason that credits for graduation are given out before project work has been completed, and pupils on graduation are liable to seek permanent occupation, thus ignoring the obligations of project work.

There is no objection to eighth graders who are fourteen years of age doing project work. The number of failures in project work among eighth graders is due in part to the greater percentage of failures among urban pupils, thirty-five per cent, over that of rural pupils, twenty-nine per cent. But the chief cause is lack of responsibility to carry out projects on a large basis. Project work will find itself more and more confined to the first and second year high school and special pupils.

(f) At what age should pupils be enrolled for project work?

Table one shows that in Minnesota for the year 1918-1919, one and four tenths per cent of pupils were thirteen years of age, thirteen and six tenths per cent fourteen years of age, thirty-one per cent fifteen years of age, twenty-four and three tenths per cent

sixteen years of age, eighteen and four tenths per cent seventeen years of age, eight and eight tenths per cent eighteen years of age, one and eight tenths per cent nineteen years of age, seven tenths per cent twenty years of age. Sixteen years is the average age in Minnesota and other states.

Table twenty-eight shows that twenty-five per cent, thirty-five per cent, thirty per cent, thirty-one per cent, twenty-three per cent, forty-four per cent, fourteen per cent, and one hundred per cent respectively of each group failed to complete projects. It appears that project work should appeal to pupils between thirteen and seventeen years.

The fact that boys over seventeen years of age are eligible to enter the School of Agriculture at University Farm, St. Paul, will tend to keep the older boys out of high school departments of agriculture. The state inspector of high schools in Minnesota contends that boys of normal high school age should be educated in the high schools of the state and not in special schools. He argues that education of farm boys in special schools will draw class distinctions and emphasize class prejudices. He believes that farm boys should be educated alongside town boys in order that they may understand each other's problems. He grants that the over-aged boy will feel more comfortable in the special school.

The State Legislature at its last session in 1919 authorized the location of a new fourth school of agriculture at Waseca but appropriated no funds. There is promise of a lively contest at the next session of the legislature (1921) when funds will be sought to establish this fourth school and possibly one or more

additional schools. This is a continuation of the struggle that took place in 1909, when the State Legislature passed the Putnam Act, which carried provisions for the creation of departments of agriculture in ten high schools of the state. The opposing forces argued for special schools of agriculture similar to those in Wisconsin. The history of the schools in Wisconsin clearly indicates that the Minnesota Legislature acted wisely in avoiding separate schools of agriculture. However, Minnesota schools of agriculture, under University control, have rendered excellent service to the farming interests of the state. No one disputes this nor is any one disposed to deny the need of a few special schools of this type.

HOME-PROJECT WORKERS IN MINNESOTA, 1918-1919

Towns	Sex			Age								Residence		Year in School					Special
	Boys	Girls	Total	13 years	14 years	15 years	16 years	17 years	18 years	19 years	20 years	Rural	Urban	8th	9th	10th	11th	12th	
1.	12		12	1	2	2	4	1		1		10	2		6	3		3	
2.	9		9	1		4	2	1	1			6	3		4	3	2		
3.	17	12	29		3	14	6	5		1		17	12		15	10	4		
4.	10		10		2	3	2	2	1			8	2	1	3	3		3	
5.	8	2	10		2	4	1	1	2			4	6		7	1	2		
6.	6		6			3	2		1	2		6	0		6				
7.	12	1	13		2	7	3	1				3	10		8	4		1	
8.	13		13		1		4	5	2	1		12	1		8	2	1	2	
9.	22		22		1	6	3	4	6	1	1	19	3		11	4	1	6	
10.	9		9		1	1	2	2	2	1		4	5		5	4			
11.	25		25			1	9	4	8	3		7	18		7	13	3	2	
12.	15	4	19				13	6				7	12	5		11	1	2	
13.	6		6			4	2					5	1		3	3			
14.	13		13			1	4	6	2			13						13	
15.	15		15		5	4	6					13	2		10	3	2		
16.	10	14	24		3	8	5	6	2			20	4		8	6	6	4	
17.	18		18		4	2	6	3	2		1	12	6		5	6	4	3	
18.	21		21	1	1	4	3	8	2	2		13	8		7	7	4	3	
19.	27		27	1	11	9	4	2				13	14	12	8	3	4		
20.	14		14			5	2	4	3			11	3		10	4			
Total	282	33	315	4	39	80	83	61	34	12	2	205	112	18	131	90	34	29	13
Per cent of Total	89.5	10.5		1.4	13.6	31.8	34.3	21.8	8.8	2.8	.7	64.4	35.6	.4	5.4	3.5	9.1	8.4	6.2

Data Taken from official records in office of State Supervisor of Agricultural Education.

TABLE 3.

HOME-PROJECT WORKERS IN THE STATES
FOR THE YEAR 1919

	No. Depts.	No. Pupils		Total	Av. No. of Pupils	Percent Boys
		Boys	Girls			
Alabama	37	369	37	406	15	90
California	23	333	3	335	15	99
Colorado	16	193	43	236	15	81
Delaware	5	70		70	14	100
Florida	11	138	9	147	13	93
Illinois	43	1013	123	1136	27	89
Iowa	10	180		180	16	100
Idaho	7	221	9	230	33	96
Kansas	16	263		263	16	100
Kentucky	25	464	321	785	11	59
Louisiana	21	323		323	15	100
Maryland	7	78		78	11	100
Maine	9	178	34	202	22	88
Montana	9	168		168	19	100
Missouri	7	108	1	109	16	99
Nebraska	8	137	17	154	19	89
Nevada	3	47	3	50	17	94
New Mexico	5	80	28	108	23	74
Ohio	40	728	19	745	19	97
Oregon	5	88		88	17	100
So. Carolina	25	434	39	473	16	91
So. Dakota	9	150	55	205	23	73
Tennessee	22	364	269	633	29	57
Utah	24	888		888	37	100
W. Virginia	20	241	115	356	13	70
Wyoming	5	73	3	76	15	98

Data from third annual report of Federal Board for Vocational Education, pages 230-231. Those states having special schools not included in order to show conditions only in high school departments of agriculture.

TABLE NO. 4.

HOME-PROJECT WORKERS IN MINNESOTA
1919--1920.

School	Sex			Age								Year in School						Residence			
	Boys	Girls	Total	12 years	13 years	14 years	15 years	16 years	17 years	18 years	19 years	20 years	21 years	8th	9th	10th	11th	12th	Special	Rural	Urban
1.	18		18			3	7	6	1	1					9	7	2			18	
2.	13		13			3	3	5	1	1					7	5				13	
3.	13		13				3	4	1	4				3	5			4		13	
4.	8		8			2	3	2	1	1									6	2	
5.	13		13			2	4	2	2	2					8	2	1	1	5	7	
7.	14	2	16			5	4	6	1	2					8	5	3		2	12	
8.	21		21			5	5	4	4	3					4	8	6	3	19	2	
9.	18		18		1	2	4	4	5	1					5	6	6	1	17	1	
10.	10		10			1	4	4	4	1					7	3			10		
11.	18		15		1	1	1	5	3	2					5	6	4		9	6	
12.	7		7				2	2	3	1		1							4	3	
13.	14	1	15			3	1	5	3	1									13	1	
14.	11		11				1	7	2	2				4	2		1	4	11		
15.	11		11		4	1	3	1	2	2					4	6		1	9	2	
16.	10	7	17			2	7	3	3	2				1	6	2	4	4	16	1	
17.	13		13			1	3	3	5		1			2	2	3	1	3	10	3	
18.	13		13																9	3	
19.	18		18	1	3	6	3	2	2	2		1		4	9	2		3	7	11	
20.	15	3	18			1	4	5	4	3	1				8	7	2	1	12	6	
21.	9		9			2	2	3	1	1					7	2			8	1	
22.	13		13			1	4	5	2	1					7	4	2		13		
23.	14		14		1	1	3	1	5	3				3	9	1			12		
24.	11		11												8	3			6	5	
25.	13		13			8	3	1	1	1					13				13		
26.	13		13			1	6	2	1	1	1								9	3	
27.	25		25		2	6	4	7	3	1	1				21	4		2	22	3	
28.	9		9				2	4	2	1				3	3		1	2	9	3	
29.	19		19			3	7	4	2	1	1	1		1	11	3	2	2	16	8	
30.	34		34			3	9	14	5	3				1	14	15	1	1	26	4	
32.	10		10				2	6	1	1									6	8	
33.	25		25	1	4	6	8	3	2	1					13		11		17	4	
34.	16		16			1	4	2	5	2	1	1		2	7	3	2	2	12	4	
35.	16		16			1	4	4	6	1					5	1	6	4	12	4	
36.	10		10			1	1	5	3	3					10				10		
37.	20		20			1	3	5	6	4	1			6	11			3	17	3	
38.	5		5			2		1	2	1				2		1	2	1	4	1	
39.	20		20			1	11	6	1	1					8	1	1	1	12	8	
40.	15		15			3	2	5	3	2					9	3	2	1	13	2	
41.	10		10			1	3	5	1					2	2	1	2		10		
42.	14		14			1	5	6	1		1				8	3	2	1	12	2	
Total	571	13	584	2	12	80	145	169	99	47	10	3	1	34	55	107	63	28	34	48	128
Percent of Total	9.8	2.		.3	2.	14	26.	30.	17	8	2.	.5	.2	7.49	21	12	5	7.	79.	22.	

Data from reports of instructors to State Supervisor of Agricultural Education.

AVERAGE ENROLLMENT OF AGRICULTURE
PUPILS IN MINNESOTA HIGH SCHOOLS
FOR TEN YEARS

School Year	No.Depts.of Agriculture	Total Enrollment of Pupils in Agriculture Classes	Average No.Pupils per Dept.
1909-10	48	1331	28
1910-11	73	1702	23
1911-12	116	2961	26
1912-13	123	3631	29
1913-14	134	4053	30
1914-15	128	4571	36
1915-16	152	4643	30
1916-17	156	5350	34
1917-18	145	4137	29
1918-19	81	2718	34

Data from High School Inspector's Reports
for Minnesota High Schools.

TABLE NO. 6.

Enrollment of Pupils in Agriculture Classes
in Those Schools Now Maintaining Smith-Hughes
Departments in Minnesota, 1910-1919.

	'10-'11	'11-'12	'12-'13	'13-'14	'14-'15	'15-'16	'16-'17	'17-'18	'18-'19	'19-'20	Av. No. Pupils before 1918- 1919	Av. No. Pupils after 1917- 1918.
1.	45	20	38	300	46	28	19	43*	10*	18*	34	14.
2.	47	20	47	71	70	24	29	45*	22*	12*	44	17
3.				57	78	71	77	40	43*	12*	61	28
4.	.						14	27	9*	8*	21	9
5.			18	25	28	30	29	20	22*	12*	25	17
6.								6*	6*		6	
7.			8	23	9	9	11	15	14*	16*	13	15
8.								14	39*	21*	14	30
9.			32	49	28	36	56	12*	18*	18*	35	18
10.			54	83	37	51	84	46	14*	10*	59	12
11.			42	22	20	24	18	52	31*	15*	30	23
12.						15	27	33	26*	7*	25	17
13.			24	17	18	19	19	27*	8*	15*	21	12
14.					64	11	15	25	15*	11*	29	13
15.			46	33	34	20	33	44	26*	11*	35	19
16.						14	34	33	22*	17*	27	20
17.				40	70	58	45	60*	55*	13*	55	34
18.			15	39	19	42	47	50	25*	12*	35	19
19.			34	14	34	18	17	11	31*	18*	21	25
20.			62	60	69	48	45	46*	29*	18*	55	24
21.				56	51	37	113	49	26	9*	55	9
22.									30	12*	30	13
23.	22	20	20	26	37	39	29			14*	28	14
24.						39	12	5	35	11*	23	11
25.	14	60	53	72	70	9	46	53	35	13*	46	13

(Continued on next page)

(Table No.6 Continued)

	'10-'11	'11-'12	'12-'13	'13-'14	'14-'15	'15-'16	'16-'17	'17-'18	'18-'19	'19-'20	Av. No. Pupils before 1918- 1919	Av. No. Pupils after 1917- 1918.
26.			22	16	21	11	25	24	32	12*	22	12
27.				47	66	53	13	22	40	25*	40	25
28.					49	30	23	26	10	9*	28	9
29.	21	23	37	10	11	25	25		23	19*	22	10
30.				41	32	34	22	19	37	34*	31	34
31.						29	73	84	79		66	
32.			19	30	30	25	14	23	32	10*	25	10
33.			52	60	68	64	77	42	19	25*	55	25
34.			16	7	34	74	26	13	17	16*	27	16
35.			25	4	10	17	17	23		16*	16	16
36.			21	6	29	30	25	18	23	10*	22	10
37.						12	36	31	10	20*	22	20
38.				20	16	22	22	31	7	5	18	5
39.			38	45	39	30	20	33	76	20*	44	20
40.			44	30	40	10	11	31		15*	28	15
41.				15	21	22	33	23	29	10*	24	10
42.			36	39	42	32	32	43	30	14*	36	14

* Smith-Hughes Departments.

Data from State High School Inspectors' Reports.

TABLE NO. 7.

HOME-PROJECT WORKERS IN MINNESOTA.-- A SUMMARY
AND COMPARISON

Year	1917-18	1918-19	1919-20
No. of Schools	7	20	41
No. of Pupils	51	315	584
Av. No. of Pupils per School	7.3	15.6	14.5
No. of Boys	45	282	571
No. of Girls	6	33	13
Percent Boys	88.3	91.	97.8
" 13 years			.3
" 13 years	1.9	1.4	3.1
" 14 "	3.9	13.6	14.
" 15 "	9.9	31.	25.5
" 16 "	41.3	24.3	29.7
" 17 "	15.7	18.4	17.
" 18 "	19.6	8.8	7.8
" 19 "	5.8	1.8	1.7
" 20 "	1.9	.7	.5
" 21 "			.17
Average Age	16.5	18.	15.8
Percent 8th Grade		.4	6.5
" 9th "		43.4	46.
" 10th "		32.5	20.5
" 11th "		9.1	11.9
" 12th "		8.4	5.3
Percent Special		6.2	6.5
Percent Rural		65.	78.
Percent Urban		35.	21.

Data from Official Records in Office of
State Supervisor of Agricultural Education.

CHAPTER IV.
SPECIAL INDUCEMENTS TO
UNDERTAKE PROJECT WORK

Table eight, page 37, shows that in one hundred and twenty-nine schools of the United States, one thousand four hundred seventy-one pupils out of three thousand nine hundred fifty-two, or thirty-seven per cent, were enrolled in boys' and girls' club work; that forty-four schools gave cash prizes, six schools gave merchandise prizes, nineteen schools promised special trips, five schools gave medals, ninety schools gave extra school credit and five schools had other miscellaneous inducements. Twenty-one per cent of the pupils in Minnesota vocational classes of agriculture were enrolled in boys' and girls' club work, fifteen per cent of the schools offered cash prizes, five per cent gave merchandise prizes, five per cent gave special trips, and forty per cent gave extra school credit.

In some states, like California, Georgia, Kansas, Michigan, New Jersey, Pennsylvania, Utah, and Wisconsin, the vocational boards may have directed local school authorities not to enroll Smith-Hughes pupils in Smith-Lever club work for the reason that this was a duplication of federal support and not warranted in the spirit of the law.

The principal business of a vocational instructor of agriculture is to direct Smith-Hughes projects. But the data show that in the opinion of many school authorities no objection is found to enrolling all or part of Smith-Hughes projects in boys' and girls' club contests, for the purpose of adding strong

incentives, thru the competition created, the prizes offered, and the special privileges presented for undertaking and completing project work.

In Minnesota the situation in this regard is especially fortunate. The state supervisor of agricultural education is assistant club leader, and he is doing all he can to stimulate club contests, in cooperation with the excellent leadership of the state clubleader. As Smith-Hughes projects grow in volume, it is possible that separate contests may be organized. Until then it seems best to stimulate interest in project work by urging the workers to unite with the boys' and girls' contests of the community and the state.

The data concerning extra school credit for project work are not reliable, for the reason stated in Chapter One. Yet it is clear, from an examination of the replies to this question, that school authorities realize that pupils are reluctant to do double period class work thruout nine months of the school year and in addition perform projects of six months' duration. Schools which maintain class work for nine months will do well to offer an extra one-third or onehalf credit for completion of project work. Schools requiring only six months' class work will not find it necessary to give this inducement.

Table Two shows that of three thousand nine hundred and fifty-two pupils in twenty-nine states reported, seventeen per cent were enrolled in six months' classes, and fifty-two per cent of three hundred eight pupils in Minnesota schools were similarly enrolled. Eleven schools out of the twenty in Minnesota for 1918-1919 gave six months' class work, while in 1919-1920, out of forty-one schools, fourteen had six months' courses, seventeen had nine months' courses, and

eight had both six and nine months' courses.

The State Department of Education favors the six months' courses to meet the needs of farmer boys. Hence the question of credit for home project work will be solved in time, no doubt, by the understanding that six months' supervised practice work in addition to six months' class work will earn one school credit.

But this matter of credit is not so important as some school administrators think. Few boys will be induced to do project work for the sake of school credit, especially will this be true for boys from the farms.

The chief concern of school authorities should be to select instructors who can inject sufficient interest and enthusiasm into their instruction and supervision that school credit will be a very small issue. Until a larger number of farmer boys enter our high schools and seek honors of graduation, school credit for project work may be left for final adjustment at a later date in the development of vocational agriculture.

SPECIAL INDUCEMENTS FOR HOME-PROJECT WORK.

	No. Pupils in Boys' and Girls' Club Contests	No. Schools Offering Prizes	No. Schools Offering Merchandise	No. Schools Offering Special Trips	No. Schools Offering Medals	No. Schools Offering Other Inducements	No. Schools Offering Extra School Credit	No. Schools Reporting
Cal.	0	0	0	0	0	0	1	2
Colo.	55	1	0	0	0	0	2	2
Ga.	0	1	0	1	0	0	0	3
Ill.	50	3	1	1	0	1	5	7
Ia.	80	2	0	1	0	1	4	5
Ida.	3	1	0	0	0	0	4	4
Ky.	130	2	1	2	1	1	5	7
Kans.	0	1	1	1	0	0	5	8
La.	12	1	0	1	0	1	1	2
Mont.	40	1	0	1	0	0	1	2
Mass.	59	6	1	2	0	0	2	7
Mich.	0	1	0	1	0	1	4	5
N.D.	42	2	0	0	0	0	3	4
N.C.	2	1	0	0	1	0	1	3
N.Y.	109	1	0	0	0	0	1	4
N.J.	0	0	0	0	0	0	0	2
Neb.	653	2	0	2	2	0	6	6
Ohio	5	0	0	0	0	0	4	9
Okla.	6	0	0	0	0	0	0	2
Ore.	5	2	0	0	0	0	3	3
Pa.	0	0	0	0	0	0	0	3
S.D.	3	1	1	1	0	0	4	7
S.C.	7	1	1	1	0	0	3	7
Tex.	51	2	0	1	0	1	2	4
Utah	0	1	0	1	0	0	2	2
Wn.	7	2	0	0	0	0	5	5
W. Va.	66	2	1	1	1	0	8	8
Wyo.	10	0	0	0	0	0	2	2
Wis.	0	4	0	0	0	0	3	4
Total	1471	44	6	18	5	5	82	129
% of Total	37	34	5	14	4	4	64	
Minn.	64	3	1	1	0	0	8	18
% of Total	21	17	5	5	0	0	44	

Data from questionnaire sent to instructors in May, 1919.

SELECTION OF HOME-PROJECTS

(a) Should the project be related to the course in agriculture?

This seems to be an established principle in vocational agriculture. Per cent of pupils taking farm crops courses, (58; per cent finally selecting farm crops projects, 45; Per cent of pupils taking animal husbandry courses, 20; per cent of pupils finally selecting animal projects, 16. Per cent of pupils taking horticulture courses, 14; per cent of pupils selecting horticulture projects, 10. Per cent of pupils taking farm management courses, 5.7; per cent of pupils selecting farm management projects, 5.4. Per cent of pupils taking soils courses, 3.5; per cent of pupils selecting soils projects, 3.5. In making this count, garden projects were rejected as farm crop projects, because of closer relation to horticulture. On account of many pupils in farm crops classes selecting garden projects because of urban residence, the greatest deviation from the principle stated appears for farm crop pupils, altho the deviation is largely due to necessity.

The selections for the year 1918-1919 in Minnesota which violated in any degree this principle are as follows:

- (1) Corn with animal husbandry,
- (2) Corn with horticulture and soils, (three cases),
- (3) Corn and farm records with farm management,
- (4) Corn with farm management,
- (5) Corn and fertilizer with soils and horticulture,
- (6) Potatoes with farm management,
- (7) Alfalfa with soils,

- (8) Clover with soils,
- (9) Swine with farm crops,
- (10) Silo construction with farm management,
- (11) Garden with farm crops (34 cases),
- (12) Onions with farm crops,
- (13) General farming with animal husbandry (2 cases),
- (14) Clearing land with animal husbandry,
- (15) Farm records with farm crops,
- (16) Poultry with farm crops,
- (17) Baby beef and corn with animal husbandry.

Numbers 1, 9, and 16, can not be justified under any circumstances.

Numbers 5, 7, and 8, are proper if the pupil has had previous instruction in farm crops and the purpose is to make observations of soil requirements.

Numbers 3, 4, and 6, are allowable if previous instruction has been given in farm crops (which is common practice) and emphasis is placed upon improved farm management thru proper farm records.

Number 10 is a right choice if previous instruction has been given in farm shop work or the boy possesses mechanical skill and the general methods of silo construction have been presented. This project was entirely ^{of} a mechanical nature, and not related to the improved management of an individual farm. It was performed by a town boy.

The thirty-four cases of garden projects associated with farm crop courses are due to the necessity of finding something

possible for town pupils to perform. Seven were chosen by town girls, twenty-four by town boys, and ten by rural girls. There is no objection to town boys and girls learning how to keep gardens, in fact, it is very desirable. But this should be done in connection with grade school agriculture and not be a feature of Smith-Hughes agriculture.

There is no objection to rural girls learning how to keep gardens, in fact, the women and girls on the farms do most of the work in keeping the family supplied with vegetables. If girls are admitted to farm crop courses, this is the logical choice of a project. But it would be preferable to have rural girls do their garden projects in connection with courses in horticulture and not in farm crops.

Onions is in the doubtful column. No farm crop textbooks give any measurable treatment of onion culture, the subject being discussed in horticulture textbooks. However, project study in this case may be easily related to the course of instruction. If the project is on a small scale it belongs in the horticultural group; if on a large scale (one-quarter acre in this instance) it may be accepted in the farm crop group.

General farming with animal husbandry is of course necessary to take care of town boys who have no livestock with which to work. If the boy is permitted to make use of his knowledge of feeding rations or to keep records on phases of livestock management, the project will prove very profitable. If, however, the boy simply works on a farm as a laborer and is impressed with the drudgery of his routine labor, with no stimulus to make careful observations and summaries, the project is poorly

selected, serving only to put money in the boy's pocket, to give him school credit, and probably a lasting distaste for the farming game.

Clearing land was chosen by a rural girl in northern Minnesota. It is doubtful that a course in animal husbandry would give her any well defined methods of procedure in clearing land, unless she were convinced that the most economical method was to pasture sheep and cattle upon the land for a period of years, before attempting to blow out the stumps. A poultry project would have been a better choice.

Farm records with farm crops is a good choice, provided the pupil is required to keep records of his own work, as well as that of others. This project is an improvement one, and lacks the financial motive. It may appeal to an older pupil, who is already familiar with the processes of farm crop production. The project belongs in the farm management group.

In a few instances good choices of projects were spoiled by changes to projects not closely related to the subject of instruction. The cases follow:

- (1) Dairy cows to corn (animal husbandry course),
- (2) Cow and calf to corn and potatoes (animal husbandry course),
- (3) Dairy cows to general farm practice (animal husbandry course), 3 cases,
- (4) Poultry to general farm practice (animal husbandry course), 3 cases,
- (5) Orchard to general farm practice (horticulture course),

- (6) Corn and swine to general farm practice (animal husbandry course),
- (7) Potatoes to general farm practice (farm crops course),
- (8) Corn and swine to corn (animal husbandry course),
- (9) Potatoes to general farm practice (horticultural course),
- (10) Corn to garden (farm crops course),
- (11) Landscape to dairy cows (horticulture course),
- (12) Corn and fertilizer to general farm practice (soils course),
- (13) Orchard to potatoes (horticulture course).

Numbers 1, 2, 8, and 11, are indefensible changes.

Numbers 3, 4, 5, 6, 7, 9, and 12, are such changes as will occur when the boy is unable to do a definite piece of work— (1) on account of shortage of labor on the farm, in the case of the boy who lives on the farm; or, (2), in the case of the town boy who is disappointed in securing animals with which to deal, or who prefers to work as a laborer on the farm. Three changes were made by townboys and six changes by rural boys from closely related projects to general farm practice. Most of the changes are due to weak supervision on the part of instructors. In one locality instructors were changed in mid-summer with the result that school credit was given for labor performed on the farm, no records of any kind being kept.

Number 10 (corn to garden) was a poor change, made by a town boy, who worked as a laborer on a farm, and kept a small garden as a side issue.

Number 13 (orchard to potatoes) may be considered a fair

exchange, provided potatoes has been a topic in the horticulture course, or sufficient study has been done by the boy in advance to anticipate his problems. Otherwise potatoes should be a project with a farm crops course, with which this crop is usually associated for study.

In other instances poor selections were remedied by changes to related projects, Examples: (1) Poultry to potatoes (farm crops course); (2) Poultry to garden and potatoes (farm crops course). In still other instances changes were made which did not violate the principle of the close relationship of the project to the course of instruction. Examples follow:

- (1) Dairy cows to swine (animal husbandry course),
- (2) Corn to potatoes (farm crops course) 2 cases;
- (3) Oats and peas and swine to corn (farm crops course),
- (4) Potatoes to corn (farm crops course),
- (5) Corn to wheat (farm crops course),
- (6) Beans to corn (farm crops course),
- (7) Wheat to oats (farm crops course),
- (8) Wheat to corn (farm crops course),
- (9) Replan farm to general farm practice (farm management course),
- (10) Keeping farm records to general farm practice (farm management course).

Number 1 is due to the greater difficulty in securing permission to take over the dairy herd for management. The boy finds it easier to buy ^a pregnant purebred sow, giving his note if need be for the purchase price, thus launching out on his own financial

enterprise, without much cooperation from parents.

Numbers 3, 4 and 6, are even exchanges, both being cultivated crops.

Number 3 is a recognition of the greater possibilities of management in a cultivated crop than in a small grain crop. The dropping of swine as a minor project with corn is regrettable.

Number 5 is possibly a mistake, except where the climate or the soil is unfavorable to corn.

Number 7 is an even exchange, prompted by local farm conditions.

Number 8 was wisely made.

Numbers 9, 10, and 11, degenerated from something definite to recognition of general farm labor for school credit, with little exercise of farm management principles.

(b) Should soil and climate be considered in the selection of projects?

No instructor in Minnesota has approved the growing of corn in a section where the growing season is too short to insure the maturing of the crop. Only three schools in Minnesota for the year 1919-1920 were located in the questionable area for corn. Only one corn project was attempted in these schools, and this by a pupil of the school on the border line of the corn area. The potato project was the choice in place of corn for a cultivated crop, northern Minnesota soil, especially in the northwestern section, being famous for large potato yields. These schools were thus located.

The same holds true for the corn and potato projects in 1919-1920, four additional northern schools not attempting the

hazards of corn production. Potatoes in southern Minnesota schools is the choice of a town boy or girl, only one potato project being the choice of a rural pupil, a girl.

Bean projects were chosen by two northern Minnesota pupils but not completed. Three pupils chose bean projects in southern Minnesota, only one being completed. General farm practice shows that beans should prove a satisfactory project in southern Minnesota but not in northern Minnesota because of climatic conditions. Tomatoes were chosen for central Minnesota.

(c) Should the type of farming in the community influence the selection of projects?

Wheat was not attempted in the cut-over region, following the general practice of the farmers. Swine or dairy projects were chosen in the corn area and poultry in the potato area. Poultry projects in southern Minnesota are the selections of town boys and girls or of rural girls, only four rural boys in southern Minnesota doing poultry project work. Three of these latter were in one school where the instructor was especially fitted to give instruction in poultry.

(d) Should projects be attempted without consideration of building conveniences, suitable machinery, and adequate horse power?

Apparently not. One striking exception was noted where the boy lost part of his swine litter because of poor housing conditions. This project, however, was the means of convincing the father of building a modern hog house to displace a filthy shelter. Some of the poultry projects were not entirely successful because poultry houses were not made proof against destructive

animals. It is a question whether a boy should be permitted to go ahead with a project under the handicap of inadequate facilities for the work, in the hopes that the parent may see the necessity and desirability of cooperating with the instructor and the boy in making the project a success. The probability of success from a financial viewpoint may be greatly lessened, ending in possible abandonment of the project. On the other hand, the management required under adverse circumstances may compensate, from an educational viewpoint, far above the financial returns. No definite answer can be given to this question. Every instructor must judge how far he is justified to ignore local farm conditions.

(e) The size of farms is a factor in the choice of projects in northern Minnesota, where the cultivated fields are small, although climate and soil are the principal influences.

The price of land apparently has not affected selection by forcing to any intensified type of farming for a project. Such an influence is present but difficult to reveal in a study of this kind.

(f) Should demand and supply prove factors in selection of projects?

Wheat was evidently grown in one or more localities because of the high price prevailing for the same. Normally the crop in these localities is corn, wheat long ago having dropped out as a profitable crop. However, the patriotic appeal to grow more wheat must have had considerable weight with the boys, as well as with the fathers.

Beef cattle was not a popular project, despite the high price of beef, only one boy having a baby beef project.

Only one pupil sought to add to the supply of farm products by clearing land.

(g) Should family needs be considered in selecting projects?

Many pupils report that what they produced, like garden truck, poultry, eggs, milk, etc., was consumed in the home. The relation of corn projects to local farm consumption needs is shown by frequent mention of "hogging off" as a method of disposing of products. In most instances the projects are part of the regular farm units of production, the boy taking, for example, five of the twenty-five acres of corn for his project; one of the sows with its litter, or part of the dairy herd, or one of the beef calves.

(h) Should tenancy prove a factor in selection of projects?

No data are available regarding the direct influence of tenancy on the selection of projects. Projects on tenant farms of course will largely belong to the productive class of projects, for the reason that the tenant seldom feels called upon under his contract to seek any improvement in farm conditions, unless he holds a long-time lease. His boy, consequently, would not be inclined to select tile drainage, poultry house construction, setting out of orchard, etc. The fact is, neither the boy of the tenant nor of the owner, is inclined to improvement projects, less than one tenth of the projects for the year 1918-1919 in Minnesota being for this class. This count includes seed corn improvement, poultry flock improvement, swine herd improvement, dairy herd improvement, orchard improvement, crop rotation improvement, and soil improvement. As project work wins favor, a greater inclination to select projects of the improvement kind will be manifested.

(1) Should the cooperative spirit of the parents toward project work be an important factor?

Many fathers in Minnesota for the year 1918-1919 purchased purebred sows, or settings of eggs from purebred flocks, to encourage their sons. Some were willing to pay good prices for better seed corn and seed potatoes. Others were disposed to make needed repairs on buildings to insure the success of projects. Balanced rations were made possible often by the purchase of feeds not produced on the farm, not, perhaps, a wise farm management practice always, but at least a demonstration of a parent's willingness to help his boy.

Such accounts of cooperation might be greatly extended. On the other hand, some exceptions must be noted, by way of contrast.

One boy succeeded in producing some splendid cockerels and pullets, despite the heavy handicap of an obstinate, unreasonable father. His ambition was to carry off the prizes at the local poultry show. By the decision of all parties who had seen his birds, this boy was regarded as the easy winner at the show. But alas! The evening before the show, the boy became the object of his father's extreme displeasure, and in his ungovernable wrath, and in the spirit of revenge, the father absolutely forbade the son to take the birds off the farm. Imagine the bitter disappointment, the utter dismay of the boy. He appealed to the instructor for his good offices with the father, but the latter was immovable. The show passed into history, and the boy was forced to witness the triumph of his rivals, all because his father could not see

that his attitude was tearing his boy away from him and the farm with the greatest certainty. It is somewhat comforting to note that this same father has since, in his own brusque way, shown some inclination to encourage his son by offering to let his son have five acres on the farm for a corn project.

Another father was very indifferent to the losses sustained by his boy in his litter of pigs thru improper housing conditions. He even refused to let his son have a small portion of a large pasture lot, little used, for the pigs. But as the season advanced and the few remaining pigs continued to prosper under the care of the boy, the father became convinced of the value of the project and the advisability of cooperating with his son. Consequently he caused to be built one of the best hog houses in the county.

(j) Should sex of pupil play a part in the selection of projects?

This is very evident. Gardens (often with canning) and poultry were popular with girls, both urban and rural. Two urban girls chose tomatoes and canning. One rural girl chose potatoes, two selected corn, and one took the ambitious project of clearing an acre of land and growing a crop of flax. In Boys' and girls' club work, girls carry off the prizes frequently in those projects which we think of as especially appealing to boys, such as pig and baby beef contests. There is no reason why girls cannot succeed with swine, baby beef and dairy projects. But as poultry is generally neglected on the farm, except as the farm wife takes an interest in this phase of production, it seems very wise for instructors to point out to the few girls who may be in his agriculture classes the advantages of proper poultry management thru

project work. Gardens for girls in farm crops courses seem the best choice for the reason assigned to the poultry project.

(k) Should age have any bearing on project selection?

Age seems to have no bearing upon the choice of a project.

Swine and poultry are popular at all ages, for boys in animal husbandry courses. Corn, potato, wheat, and alfalfa projects were attempted at nearly all ages. The year of school in which the course was given of course affected the age distribution for projects, farm management projects being selected by older boys because this course is usually given to upper classes. The younger boy was not outdone by his older classmate, even in selecting two projects or major and minor projects, like wheat and corn, dairy and swine, corn and swine, orchard and alfalfa, etc.

(l) Should personal inclinations of pupils influence the choice of projects, or should the instructor's specialized knowledge and farm experience be the controlling factor?

The personal choice of pupil is strongly manifested in the selection of projects by Minnesota pupils, especially in animal projects. The writer has heard many pupils express their desire to become breeders of purebred swine, because they saw the possibilities of becoming recognized as swine experts in their communities. The same may be said for poultry and dairy devotees. Some boys in farm crop courses have expressed a desire to become producers of pure seed corn or potatoes.

A glance at tables nine⁵⁶ and 13 AB¹¹⁻⁶² must convince the reader that the variety of projects shown for each school meant a freedom of choice for the pupils. It would be possible for the in-

structor to insist upon all his pupils taking the same project, e.g. corn or potatoes, in the farm crop group, swine or poultry in the animal group, if he wanted an easy time thruout his teaching and supervisional work. There are some arguments in favor of a standard project for all members of a class. But with the exception of five schools, at least two kinds of projects were selected by members of the classes in vocational agriculture in Minnesota, for the year 1918-1919. The writer is satisfied, knowing each of the instructors personally, that in at least three cases no attempt could have been made to thwart the free choice of projects by the pupils. The pupils simply chose wisely to do project work along the line of the best farming practice of the community. In one case an animal husbandry class composed of girls chose poultry projects, in which every girl could find a lively vocational interest. In another case poultry projects were chosen by town boys, because they had greater interest in poultry than other kinds of animals.

This freedom of choice to suit the interests of the pupil is the vital characteristic of project work. The moment anyone attempts to put anything across in a perfunctory fashion along project lines, without consideration of the pupil's individual likes or dislikes, that instant he will have trouble, and plenty of it, on his hands.

The theory of project work is that a pupil shall purpose to solve what appears to him a problem worthy of his caliber. If he seeks to satisfy a burning desire and a deep-seated craving for more information, greater skill, and a higher degree of management in that phase of farm work in which he has particular interest and concern, the psychological laws of the learning process (proper men-

tal set, readiness, effect, and satisfaction) will function in securing more permanent bonds and greater mental development for the pupil, than if he were forced to perform assigned tasks.

Occasionally a pupil may choose some project that has no great value, from the viewpoint of vocational agriculture (e.g., rabbits); in this case the instructor should patiently wait for the pupil's interests to change to something worth while. If his teaching is what it should be, the pupil will "come around all right", if the case is hopeless, despite every effort of the instructor to create in him a real vocational attitude, the best thing under the circumstances is "to make the best of it". Such cases can be avoided by being careful in taking boys into vocational agricultural classes who have no interest in the real farming operations.

(m) Should the educational possibilities be an important factor in the choice of a project?

In Minnesota, for the year 1918-1919, thirty per cent of the projects were corn, eleven and six tenths per cent potatoes, and one and four tenths per cent beans, or forty-three per cent of all projects were cultivated crop projects, while five and three tenths per cent were wheat and one and one tenth percent oats.

Other conditions, of course, as the previous discussion shows, affected the choice of projects along the line of cultivated crops. But instructors have expressed themselves at conferences attended by the writer to the effect that greater opportunities to develop the boy's capacity for judgment and reasoning and to add to his fund of scientific principles of soil and crop management exist for the cultivated crop than for the small grain crop. As one instructor said, "There is something doing all the time for a cultiva-

ted crop."

This is what is wanted in a project, "something doing all the time". The more difficulties to be surmounted, the more emergencies to be anticipated, the greater the chances for accidents, the more numerous the opportunities to acquire skill, the more varied the processes, the stronger the relationships to other phases of farm work, the more desirable becomes the project in ministering to the future welfare of the boy.

(n) Should the financial possibilities of the project be an important factor?

For at least forty-three projects in Minnesota for the year 1918-1919, instructors reported that the aim of the project was to secure a profit. Among other aims mentioned were increased yield, or increased production, which, of course, would mean financial returns from the project, if economical methods of production were followed.

Instructors seem to be agreed upon the necessity of making project work profitable for the boy. In the case of only seven projects for the year 1918-1919 in Minnesota was a financial loss reported by instructors. Immediate returns could not be reported for alfalfa, orchard, and soil analysis projects. Yet the possibilities exist, as the wise farmer understands. To permit a boy to start a project under circumstances that are certain to create a deficit in the boy's treasury seems quite uncalled for.

It is proper to point out the chances for financial gain in farming operations. Too many young men leave the farm because they are not convinced of the profitable nature of the farm business. To ignore the opportunities for the boy to start a bank account from

the profits of his project is to fail to realize upon one of the strongest appeals for interest in project work.

Yet it should be said that this motive must not be uppermost in the mind of the instructor. His work will be recognized for its good results even in the case of a financial loss, provided that no errors have been committed by the boy because of improper instruction. A financial loss, may be of the highest educational value to the boy, in so far as he may be made to see where closer attention to instruction would have insured a profit.

The development of the boy mentally, morally, and socially are the great objectives of vocational agriculture. As a means to these ends, the instructor is justified in directing the attention of his boys to those projects which have financial possibilities.

(c) Should pupils be encouraged to select projects for the sole purpose of demonstration?

If this means to use project work as experiments, in an attempt to gather scientific data in new fields of investigation, the answer must be an emphatic no. No instructor in Minnesota has made such a venture. If, however, demonstration means bringing the accepted principles of scientific agriculture, as recorded in the bulletins of agricultural college experiment stations, the answer must be an equally emphatic yes. This is one of the benefits to be derived from directed study of agriculture.

The demonstration is primarily for the benefit of the boy, not for the father, nor the community. No instructor can hope to revolutionize present farming methods by putting on spectacular demonstrations of better farming methods. Nor can he afford to let it out in the community that he intends to show the fathers of the boys how

poorly they farm. Incidentally, few parents will fail to profit from the lessons learned by the son. But no instructor should set out to convince pupils that they should get into phases of animal and plant production different from what the best farmers of the section have found profitable after a series of trials and errors.

To introduce the motive of demonstration as the principal one into project work is to throw a shadow of doubt over the probable success of the project. No boy should be asked to put his capital and labor into a speculative enterprise. Let the county agent persuade the father to speculate with a new variety of grain, with a new commercial fertilizer, etc. Let the boy get confidence in himself and farming by directing him to select those projects that the best farm practice of the section indicate may be carried to successful completion.

TABLE NO. 9

HOME PROJECTS SELECTED BY PUPILS IN
MINNESOTA HIGH SCHOOLS, 1918-1919.

- - S c h o o l s - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Corn	10	3	5	3	3	5		6	8	4	6	5	3	7	8	1	11	6		7
Wheat			1			1								5				6		5
Oats			1												1					2
Alfalfa					1								2		2	1				
Beans								1	1									1	2	
Potatoes			1	1	1		8				1	1			1	9	1	2	12	1
Garden			16		2		1		2		7	5				6		1	5	
Tomatoes												4								
Orchard					3													5		
Onions																				1
Clover					1															
Sorghum			1																	
Straw-berries												1								
Swine	2	3	5					3			6	2	3				4			2
Poultry		2	1	2			4	3	5	3	2					6	2		5	
Dairy	1			4							1		3							2
Horses																				1
Baby Beef												1								

(Continued next page)

(Table No.9 Continued)

-- Schools --

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Farm Plan									7						4					
General Farm Practice and Records	1								4		1	1					2		2	
Soil Analysis															1					
Silo Construction																	1			
Clearing Land and Flax																1				
Total for Schools	13	9	31	10	11	6	13	13	22	9	25	22	11	12	17	24	21	21	27	20

Project totals: Corn, 101, or 30%; Wheat, 18, or 5.3%; Oats, 4, or 1.1%; Alfalfa, 6, or 1.7%; Beans, 5, or 1.4%; Potatoes, 39, or 11.6%; Garden, 45, or 13.3%; Tomatoes, 4, or 1.1%; Orchard, 8, or 2.3%; Onions, 1, or .3%; Clover, 1, or .3%; Sorghum, 1, or .3%; Strawberries, 1, or .3%; Swine, 30, or 8.9%; Poultry, 35, or 10.4%; Dairy, 11, or 3.2%; Horses, 1, or .3%; Baby Beef, 1, or .3%; Farm Plans, 11, or 3.2%; General Farm Practice and Records, 11, or 3.2%; Soil Analysis, 1, or .3%; Silo Construction, 1, or .3%; Clearing Land and Flax, 1, or .3%.

TABLE NO.10

SELECTION OF HOME-PROJECTS IN MINNESOTA--1918-1919.

Project	Total planned	Sex				Age of Pupil						Year in School							
		Rural Boys	Urban Boys	Rural Girls	Urban Girls	13 years	14 years	15 years	16 years	17 years	18 years	19 years	20 years	8th	9th	10th	11th	12th	Special
Corn	101	89	10	2	3	15	27	22	23	8	4	0	5	6	9	7	7	7	
Potatoes	38	21	17	1	0	11	16	7	5	0	0	0	5	23	6	4	1	0	
Oats	4	4						1	2	1				4					
Wheat	18	16	2		1		5	6	4	2				10	3			5	
Garden	45		25	11	9		4	2	7	11	2		3	16	16	6	4		
Beans	5	3	2				1	1	1	1	1			5					
Buckwheat	1	1							1									1	
Onions	1	1						1					1						
Sorghum Cane	1	1								1				1					
Tomatoes	4	2		2					4						4				
Strawberries	1	1							1						1				
Orchard	8	3	5						1	3	2	2			1	5	2		
Alfalfa	6	5	1			1	3	1		1				3	1	2			
Clover	1	1							1							1			
Swine	30	23	7			2	8	9	6	4		1		7	20	1	2		
Poultry	35	9	20	5	1	1	6	6	7	10	3	1	1	3	4	19	3	6	
Dairying	11	9	2				4	5	2						10		1		
Baby Beef	1	1							1					1					
Horses	1		1							1					1				
Silo	1		1						1						1				
General Farm- ing and Farm Records	11	7	4						1	3	3	4		1	3	4	3		
Flax & Clear- ing land	1			1			1							1					
Replan Farm	11	11					1	4	1	3	1	1			4	2	5		
Soil Analysis	1	1							1								1		
Totals -	338	296	100	16	16	5	40	96	83	72	32	8	3	18	141	98	30	3	13

TABLE NO. 11

HOME PROJECTS IN THE STATES, 1918-1919

	Calif.	Colo.	Ga.	Ill.	Ia.	Idaho	Ky.	Kan.	La.	Mont.	Mass.	Mich.	N. Dak.	N. C.	N. Y.	N. J.	Nebr.	Ohio	Okla.	Ore.	Pa.	S. Dak.	S. C.	Texas	Utah	Wash.	W. Va.	Wyo.	Wis.	Total	
Corn	28	7	21	44	38	5	23	44	8	1	19	18	22	11	3	7	18	43	21	13	2	27	68	19	14	15	19	4	39	600	
Potatoes	16		1	11		8	4	11		14	23	21	33		21	7	29	20		9	11	32	15	14	8	8	32	1	56	405	
Small Grain	4	1		4	30	8		38			2	2					7	4	3		4	5	2		10	13	7	3	1	154	
Garden	2	2	3	8	47	10	3	10		25	61	35	11		63	1	364	4	2	7	9	37	57	16	1	13	55	2	78	906	
Orchard	2			1					1		12	3			11			4		1	1				1	14		1	9	68	
Poultry		3		19	14		65	9	3	17	16	19	18		33	5	158	10	4	12	9	12	14	14	8	19	82	2	97	693	
Swine	1	20	11	34	13	3	34	20	12	3	19	24	24		20	1	65	42		9	3	6	8	7	26	2	30	2	41	501	
Sheep	6	1		2		3	7				5	1	2		3		8	4		3				1	12	2	1	3	12	77	
Horses				1		1				2	2	1																	2	10	
Beef Cattle		3	1	2		2	2	8	2		5	2	1		4			3							1	3	32	2	4	3	86
Dairying	2	1		7		8	10	4		7	9	6	1		8	1	9	13		6	2		3		2	4	1	1	44	141	
Farm Mgt.		1		8		2	33				13	4			5	13	9	13		2			15		4		1	5	15	143	
Cement																							3								3
Farm Bldgs.			2			1						1	8		1		10						3								24
Drainage						3							1										2								7
Sugar Beets		7				10							1										1								31
Cotton			6											10									56			13					72
Beans						11		3			11				2									10	5	1					33
Mangels						2					1																				3
Soils				2		1										2															3
Bees						1		1					2														1				5
Melons						1		1						1		1															4
Farm Mech.				2									6					1													9
Soy Beans				1			1	1										1													4
Tobacco							18							6				1							11					1	37
Legumes											1							1													1

(Continued on next page)

(Table No. // Continued)

	Cal.	Colo.	Ga.	Ill.	Iowa	Idaho.	Ky.	Kans.	La.	Mont.	Mass.	Mich.	N.Dak.	N.Car.	N.Y.	N.J.	Neb.	Ohio	Okla.	Ore.	Pa.	S. Dak.	S. Car.	Texas	Utah	Wash.	W.Va.	Wyo.	Wis.	Total.	
General																															65
Farm Work				16								35	11								3										1
Greenhouse												1																			1
Plant												2																			2
Disease												1			7				1												9
Rabbits												1					10														12
Cannery										1		1																			2
Haying												2																			2
Strawberries															1																3
Peanuts																					2										1
Exhibits																							1	5							5
Landscape																								2							3
Testing Corn																							5								5
Forestry																										1					1

Percent of Totals for States:- Corn, 14.9; Potatoes 10; Small Grains, 3.8; Garden 22.5; Orchard 1.5; Poultry 17.2; Swine, 12.4; Sheep 1.9; Horses .3; Beef Cattle 2.1; Dairying 3.5; Farm Management 3.5; Cement .07; Farm Buildings .6; Drainage .17; Sugar Beets 7.7; Cotton 1.7; Beans .82; Mangels .07; Soils .07; Bees .12; Melons .09; Farm Mechanics .22; Soy Beans .09; Tobacco .91; Legumes .02; Greenhouse .02; General Farm Work .16; Plant Disease .04; Rabbits, .22; Cannery .29; Haying .04; Strawberries .07; Peanuts .02; Exhibits .12; Landscape Gardening .07; Testing Corn .12; Forestry .02,

Minnesota Project Totals:- Corn 89; Potatoes 36; Small Grains 22; Garden 49; Orchard 6; Poultry 32; Swine 36; Horses 1; Beef Cattle 3; Dairying 13; Farm Management 14; Farm Buildings 1; Beans 3; Soils 1; Legumes 4; General Farm Work 3; Haying 1; Sorghum 1.

Minnesota Percent of Totals:- Corn 28.3; Potatoes 11.4; Small Grains 7; Garden 12.4; Orchard 1.9; Poultry 10.1; Swine 11.4; Horses .3; Beef Cattle .9; Dairying 4.1; Farm Management 4.4; Farm Buildings .3; Beans .9; Soils .3; Legumes 1; General Farm Work .9; Sorghum Can .3;.

DATA from Questionnaires

HOME-PROJECTS IN MINNESOTA 1919-1920
(Plant Production Projects)

	Corn	Potatoes	Wheat	Oats	Garden	Beans	Orchard	Beets	Rape	Cabbage	Alfalfa	Sorghum	Strawberries	Pop Corn	Sweet Corn and Canning
1.	8	1													
2.	6	1													
3.	8			5											
4.															
5.		1	1												
7.															
8.	4				1		14								
9.	5														
10.															
11.	6														
12.															
13.	1						6				1				
14.															
15.	2											1			
16.	1	4													
17;															
18.	4														
19.		3			1										
20.	6	3	2												
21.	8														
22.	8			5											
23.	9	4									2				
24.	2	9													
25.	13														
26.		9	2										1		
27.	2	23						1							
28.	3	2		2					1	1					
29.	5								1	1					
30.	4	3													
31.	5			1	4										1
32.	4														
33.															
34.	2	12													
35.							3								
36.	10													1	
37.	12	2													
38.	4	1													
39.															
40.	11														
41.	5														
42.	5	1	3						1						
Totals	163	77	10	13	6	0	23	2	2	1	3	1	1	1	1
Total % of all Projects	253	12.	1.6	2.	.9	0	3.5	.15	.31	.15	.46	.15	.15	.15	.15

Tables A and B.

TABLE NO. 12 B
HOME-PROJECTS IN MINNESOTA 1919-1920
(Animal Husbandry and Miscellaneous)

	Swine	Poultry	Dairy Cows	Beef Cattle	Dairy Calves	Sheep	Dairy Bull	Bees	Horses	Planning Farm	Farm Accounts	General Farm	Farm Mechanics	Quack Grass	Drainage	Landscape	Hay
1.	4				3						3						
2.	5																
3.																	
4.		1	3			3						1					
5.		2	1		1							7					
7.	1	11	3					1		3							
8.	5	6	2										2				
9.	4	3	2		2			1				1					
10.	7	3															
11.	3				1							3	1				
12.	1	2	1						1	tractor		2				1	
13.	9	4	3		1	1											
14.	2	6	3														
15.	1	1	1		2	1	1										
16.	4	5	1	1													
17.	4	1		1	1	2					3			1			
18.	1	1	1	4				1									
19.	1	1	3			1		4				4					
20.	6	2	2		1												
21.																	
22.																	
23.																	
24.	1																
25.			2														
26.			2		2												
27.														1			
28.																	
29.	2		1									2					
30.	4	1	1	10		3						7			1		
31.	2	3	1								1						
32.	1	3				1											
33.	12	7	5					1									
34.	4	2	2		2								1				
35.	6	2	1								5						
36.																	1
37.		3															
38.																	
39.	3	4	5					1				6					
40.	5	1 (Turkeys)						1				2					
41.	4		1			1					2						
42.											2						
Totals	101	74	47	15	16	13	1	8	3	3	16	35	4	1	2	1	1
Total Percent of All Projects,	16.	11.	7.	2.	2.	2.	.1	1	.4	.4	2.	5.	.6	.1	.3	.1	.1

Tables A. and B.

TABLE NO. 13

HOME-PROJECTS IN MINNESOTA, 1917-1918.

Projects	1	2	6	9	13	17	20	Total	% of Total
Corn	5	2	1		4		6	18	34
Wheat			1					1	.9
Oats					1			1	.9
Flax							1	1	.9
Beans				1				1	.9
Potatoes		6	1	1				8	15.
Garden		2						2	4.
Poultry	1	7	1			1		10	19.
Swine	1			1		2		4	8.
Dairy	1					2		3	6.
Farm Mechanics				4				4	8.
Totals	8	17	4	7	5	5	7	53	

Data from official records in office of State Supervisor
of Agricultural Education.

TABLE NO. 14

SELECTION OF HOME PROJECTS--
-- A COMPARISON.

Project	Minnesota			United States		
	1917- 1918	1918- 1919	1919 1920	1917- 1918	1918- 1919	1919
	Percent of total No.			Percent of total No.		
Corn	34.	30.	25.		15.	
Garden	4.	13.	.9		23.	
Potatoes	15.	12.	12.		10.	
Orchard		2.3	3.		2.	
Wheat	.9	5.	2.		4.	
Oats		1.	2.			
Beans	.9	1.			.8	
Alfalfa		2.	.4		.02	
Beets	.		33		.8	
Rape			.3			
Cabbage			.1			
Sorghum		.3	.1			
Clover		.3				
Tomatoes		1.				
Pop Corn			.3			
Hay			.1			
Flax	.9	.3				
Buckwheat		.3				
Onions		.3				
Strawberries		.3	.1			
Cotton					2.	
Mangels					.07	
Melons					.09.	
Soy Beans					.09	
Tobacco					.9	
Landscape			.1			

(Continued on next page)

(Table No. 14 Continued)

Project	Minnesota			United States
	1917- 1918	1918- 1919	1919- 1920	1918- 1919
	Percent of Total No.			Percent of Total No.
Swine	8.	9.	18.	18.
Poultry	19.	10.	11.	17.
Dairy Cattle	6.	3.	7.	4.
Dairy Calf			2.	
Dairy Bull		.	.1	
Beef Cattle		.3	2.	2.
Horses		.3	.4	.3
Sheep			2.	2.
Bees			1.	.1
Turkeys			.1	
Rabbits				.2
Farm Accounts			2.	4.
Planning Farm		3.	.4	
General Farming		3.	5.	2.
Quack Grass			.1	
Farm Mechanics	8.		.6	.2
Drainage			.3	.2
Soil Analysis		.3		.07
Silo		.3		
Clearing Land		.3		
Cement				.07
Farm Buildings				.6
Total Projects	53.	83.6	64.7	4024
No. of Schools	7	20	41	129

Data from tables.

CHAPTER NO. 6

THE SIZE AND SCOPE OF HOME-PROJECTS

(a) What should be the size of home projects in units of production (acres, animals, etc.)?

Table 13^{μ.82} shows the size of projects planned in Minnesota for the year 1918-1919 and tables 29, 30, 31, 32, and 33^{μ.127-133} show the size of projects completed for the same year.

1. Eighty-one corn projects planned had an average of six and eight tenths acres with a range of one to thirty acres, the modal size being five acres (thirty projects). Sixty-seven corn projects completed had an average of nine and four tenths acres, with a range of one to fifty-five acres, the modal size being five acres (nineteen projects). This indicates a tendency to adopt the five acre corn project. "The minimum number of acres acceptable as a project should be from three to five acres".* "Corn projects vary from less than an acre to twenty acres, the average nine acres.**"

2. Potato projects planned in Minnesota for the year 1918-1919 averaged eight acres, with a range of a town lot to one acre, the modal size being one acre (twenty projects). Potato projects completed for the same year show an average of ninety-five hundredths of an acre (nineteen projects), with a range of one-eighth to three acres, modal size one acre (nine projects). The one acre potato project seems to be in greatest favor. This will increase in size as more schools in the potato region establish vocational departments of agriculture where machinery makes larger acreage possible.

* Nebraska News Letter Number Nine.

** Ohio Circular Letter, March 25, 1920.

"As to the size of a potato project, there was some difference in opinion at the various conferences. It was felt that for eastern Nebraska the project should contain from one half to one acre, depending on facilities for doing the work and the opportunity for marketing the product. In western Nebraska where potato machinery are available it was felt that a larger project could very well be carried out".*

3. The small grain projects planned in Minnesota for the year 1918-1919 show an average of eleven and eight tenths acres (twenty-three projects) with a range of two acres to forty acres, the modal size ten acres (eight projects). The average of the fourteen wheat projects completed in Minnesota was fifteen acres with a range of six to twenty-eight acres, modal size twenty acres (four projects). Ten to fifteen acres of ~~wheat~~ seem most desirable for a project. This may be increased for strictly wheat regions (Red River Valley). "Small grain projects should be about twice as large as the corn project, ranging in size from six to ten acres".*

4. Five bean projects planned in Minnesota for the year 1918-1919 were each one acre in size. No bean project was completed. One acre of beans may prove a satisfactory size.

One acre of sorghum cane (including making syrup) was planned and completed for a project.

5. Five alfalfa projects averaged two acres in the plans with a range of one to five acres, modal size one acre. Two one acre, one two acre, and one five acre projects were completed. One acre alfalfa projects are sufficiently large as a project carried on with some other project, either crop or animal.

* Nebraska News Letter Number Nine.

"It seemed to be generally agreed that the production of forage crops does not lend itself readily to project work as contemplated in vocational agriculture".*

6. Garden projects averaged four ninths acres in Minnesota as planned for 1918-1919, with a range of town lot to one acre (sixty per cent on town lots). Records do not show the size of twenty-six completed garden projects with sufficient data to find the average. It is just as well. The garden project, according to Table 12-A for Minnesota projects in 1919-1920 is fast disappearing as a desirable one in vocational agriculture. It is suited to elementary pupils. "Family gardens of one half to one eighth acres would seem suited to pupils of the eighth grade."** "It was unanimously agreed that an ordinary home garden should not be acceptable as a project.---Because gardening varies so greatly it was felt that no minimum requirement could be recommended."/

7. Orchard projects as planned showed a modal number of trees cared for as fifty. Five orchard projects completed were thirty-four, fifty, fifty-three, one hundred forty-four and one hundred seventy-seven trees, respectively, average ninety-one trees. The desirable size of an orchard project is hard to determine, depending upon the nature of the work undertaken.

8. Four tomato projects involved setting out fifty plants and canning the product. Two of these projects were completed. This project will seldom appear in vocational agriculture as a major project.

9. One onion project of one quarter acre was planned in Minnesota for 1918-1919 but no record appears that it was completed.

* Nebraska News Letter Number Nine.

** Nebraska News Letter Number Nine.

as United States Department of Agriculture Bulletin 385, page 18.

"Onions are a very remunerative crop, but they require a good deal of intensive work. It is hard to find a better crop for a project than onions".*

10. The size of the one strawberry project planned in Minnesota for 1918-1919 was not given, nor was it completed.

11. Poultry projects as planned in Minnesota ranged from one hundred eggs for hatching to fifty hens and chicks, the modal size being one hundred eggs, (twelve projects). As completed, the projects show an average of one hundred thirty-six eggs (seventeen projects) with a range of sixty-five to five hundred and nine eggs, modal number one hundred eggs. The writer feels that the poultry project, as carried on by urban pupils, is on too small a scale. If it is to prove as attractive and profitable as it may be made to rural pupils, the number of eggs hatched and chicks raised must be increased. A glance at the financial results of the poultry projects in Table 33,¹³³ will show such a need.

"Experience has proven that poultry husbandry has more teachable subject matter than any other one livestock division for high school students and that poultry husbandry is well suited for project work in villages as well as on farms".**

"Twelve to twenty-five hens in fall and one hundred to two hundred chickens next spring"./

12. Swine projects in Minnesota for 1918-1919 as planned ranged from one pig to ten brood sows and litters, modal size being one brood sow and litter (twenty projects). Swine projects completed had an average of eight pigs (seventeen projects), with a range of one pig to twenty-eight pigs (including sow), modal number six

* Arizona News Letter, December 1919, page 3.

** South Carolina News Letter, Number - page 23.

/ Nebraska News Letter Number Nine.

(three projects).

The single pig project is due to the choice of an urban boy. Of course no one will argue for such a swine project. It does well for a club contest as part of a large project. "A high school boy knows he is not doing much farming if he is caring for one pig or rearing six chicks or managing a very small garden".*

One sow and litter has been adopted for rural boys quite generally. In order that comparative results may be obtained it would seem desirable for the boy to have at least two brood sows and litters.

"One gilt if purebred, two gilts if grades; five to ten pigs grown and fattened."**

13. Dairy cattle projects varied from two cows to one entire dairy herd, with no definite tendency in the number of animals to be desired for such a project. Four of these projects were completed. The size of this project depends upon its purpose, whether it is a feeding trial for maximum milk production, a cow-testing proposition for one or more herds, raising of dairy calves, etc. Not enough has been attempted with dairy projects to draw any conclusions. "One cow for a season"---(South Carolina).

14. One baby beef project was planned but not completed. It would seem desirable for a boy in vocational agriculture that he should attempt to care for more than one animal in order to get desirable data by comparison of results obtained.

15. One horse project was planned and completed by an urban boy involving the care and management of twelve horses. No satisfactory data is at hand for a horse project. "On a farm, one horse for a year or two for a season"---(South Carolina).

* Federal Board Bulletin 21, page 11.

** Nebraska News Letter Number Nine, page 3.

16. Ten projects in general farm practice and keeping farm accounts were planned and twenty-four were reported completed, sixteen being substitutes for other projects. These projects at present are on a very unsatisfactory basis, being almost entirely recognition of labor on a farm as satisfying the requirement for supervised farm practice. When definite phases of farm work for definite periods and for definite purposes are incorporated in a general farm practice project, definite results will be possible. What the limits should be no one seems to know at the present writing.

17. Eleven projects in farm planning were not completed, five being switched to general farm practice. It is doubtful if this may ever become a recognized major project, but may be a desirable feature of properly organized general farm practice.

18. One soil analysis project was completed. This will usually appear as a feature of some other project, its possibilities being limited as a separate project.

19. One silo construction project was completed by an urban boy. He labored as a carpenter on twelve silos. He doubtless knew something about the construction of silos before the season was over, but from his experiences no one can tell what a rural boy should do to constitute a satisfactory project of this kind.

20. One girl agreed to clear an acre of ground and grow a crop of flax. The project was reported incomplete. No one yet knows how many acres of clearing represent a good project.

(b) Should sex make any difference in the size of projects?

This is not a very serious question, in view of what has been said in a previous chapter about the presence of girls in vocational agriculture classes. Yet in Minnesota for the year 1918-1919, girls showed little tendency to be outdone in the size of the jobs undertaken and completed. One rural girl completed a five acre corn project (so the records read at least), this being the modal size of corn projects but below the average size. The record of her project hours is ninety, possibly indicating (no other data being given) that at least part of the work (was it husking) was performed by others and she managed the enterprise. (Why not?)

One urban girl completed one-half acre garden project, with a profit of twenty-two dollars, the record showing that she did almost all the work. Few boys made better showings in garden work.

Girls did not have as large poultry projects as the boys, in number of eggs for hatching or in number of hens cared for.

If girls are admitted into vocational classes, they should be of the caliber that asks for no snap as a project because of sex. Girls can perform garden projects on equal terms with boys. They should be able to do so in poultry projects. Boys' and girls' club contest records show successful competition for the girls in baby beef, pig, and other projects. It remains to be seen what they will accomplish in the larger club projects, now being started for experienced club members.

(c) Should age be a factor in the size of projects?

Nebraska News Letter Number Nine (page three) states that projects will need to vary according to age and ability of student.

Dr. David Snedden in an address to the National Society for Vocational Education in St. Louis (1919) advocated an increase in the number of hours of twenty- to thirty per cent for normal boys of sixteen to eighteen years of age. He has also said (*) that young learners need smaller and shorter time projects than older.

Taking seventy corn projects for a study of this factor of age in the size of projects, the facts are:

About two-thirds of pupils completing corn projects between the ages of thirteen and fifteen had projects of smaller acreage than the average corn project (nine and four-tenths acres) for the year; while two-thirds of the boys between sixteen and nineteen years of age had projects below the average corn acreage. One-third of the boys of the younger group completed projects above the average size and one-half of the older group did the same. The same number in each group had projects below five acres in size. It should be stated that the groups were almost equal in number.

There is only a slight tendency thus shown to recognize the age factor in the size of the project. A few instructors evidently allowed this, but in the majority of the schools, boys had similar acreages, apparently as an instructor thought two acres or five acres or ten acres or the whole crop satisfactory.

The writer believes that this factor of age should be recognized more than it is. Certainly no ambitious boy above sixteen years of age should be satisfied with a corn project of two acres.

We should not have a standard sized project for every pupil

*Teachers' College Record, XX: page 433.

regardless of age. Psychologists have apparently definitely determined what we thought we already knew, that mental abilities increase with age. "The general tendency of the abilities measured to increase with age is obvious". *

(d) Should ambition of the boy be a factor in the size of the project?

The boys in Minnesota who handled corn projects of twenty, twenty-two, twenty-three, thirty, fifty, and fifty-five acres, deserve great encouragement and praise. They have entered farming on a scale that means the exercise of business principles and scientific management.

(e) Should the farm experience of the boy be a factor in the size of projects?

Only by inference and personal conversations with urban boys has the writer any information about this factor. Urban boys, performing projects like swine, poultry, or potatoes on town lots, necessarily are limited as to size of their projects, according to the records. Where the urban boy performs a project on a farm, he steps along with as ambitious a project as his rural classmate. Yet how many of these urban boys have had previous farm experience is not well known. From the questionnaire data given in Table two, we learn that of one hundred and five pupils in Minnesota not living on farms, twenty-nine had had previous farm experience for a whole season at least, and thirteen had worked on farms as laborers.

This would indicate for Minnesota at least that more than one half of the urban pupils doing project work for the year 1918-1919

*Inglis' Principles of Secondary Education, page 36.

lacked any farm experience. That the experienced pupils sought further experience on the farm can not be attested. Personal conversations with urban boys who had no appreciable amount of farm experience have been interesting in showing how anxious they are to do project work on a basis worthy of the vocational instruction being received. The inexperienced boy should be encouraged to "get into the game right". There is of course danger of going too far in this regard, especially with purebred stock.

(f) Should the area of the farm or the acres under cultivation be a factor in the size of the project?

In southern Minnesota this is not a serious problem, but in northern Minnesota, where the number of acres under cultivation on individual farms is small (the writer has lived eight years in northern Minnesota cut-over region and has traveled widely in the farming districts) a potato project of one-half acre is accepted as readily as one of one acre. It would be ridiculous to expect projects of as large size in newly settled sections as in old established farming regions.

(g) Should pupils be encouraged to enlarge or decrease their projects according to market conditions?

Only a very slight tendency in this respect seems to exist. A few wheat projects were increased in size over what was originally planned, changes possibly due to the market price of wheat, but also possibly due to the patriotic campaign for more wheat acreage. We prefer the latter interpretation, altho patriotism and the pocket book sometimes "get together".

(h) Should the educational value of the project be a factor in the size of the project?

"An average project of a field of nine acres is of sufficient size for the boy to have an opportunity to apply the best forms of farm practice which he has studied and at the same time feel that he has a project of credit to himself".*

"Not twice educational value in two acres of corn. Best to give one-half time to corn and one-half to pigs".**

The average mentioned previously for the various projects completed in Minnesota for 1918-1919, seem to indicate, on the whole, the recognition of the educational factor as one of the most important in determining the size of projects, nine acres for corn, one acre for potatoes, etc. "It is clear if eighty hours are required to grow an acre of corn, there would not be twice the educational value in growing two acres of corn. One-half time for corn and one-half time for pigs might be best."/

Major and minor projects have been carried out to increase the educational value, by introducing new problems, rather than by increasing the number of acres or number of animals to make a suitable project. Examples:

1. Seed corn and wheat,
2. Tomatoes and canning,
3. Wheat and corn,
4. Potatoes, and general farm practice,
5. Potatoes and orchard,
6. Corn and "hogging off".

No doubt this will become the general practice. State supervisors seem anxious to see projects organized on a large enough basis to merit the respect of the farmer and the project worker.

*Ohio Circular Letter, March 25, 1920.

**Federal Board Bulletin 31, page 35.

/United States Department of Agriculture Bulletin 385, (1916).

"Fattening of one hog or growing of one acre of corn can not be made economical. Crop projects should be of sufficient size to require at least a half day's work at a time." *

The size or scope of a project, for its educational value, may be increased by extending it to cover the whole cycle of production. Examples of Minnesota projects:

1. Corn--seed selection and fall plowing to marketing or "hogging off" next fall.
2. Potatoes--Plowing in fall to marketing next fall. Hill selection of seed potatoes is a good beginning point.
3. Swine--Breeding sow to fattening and marketing of pigs.
4. Poultry--Culling of flock in fall for egg production to marketing fattened cockerals next fall.

(1) How many hours should a pupil be expected to devote to a project, study and labor?

Records of hours of Minnesota projects for 1918-1919, (Tables 29, 30, 31, and 32, and 33, p. 127-123)

1. Fifty-three corn projects completed had an average of two hundred and thirty-four hours, with a range of twenty-five hours, (Record shows most of labor performed by others,) to nine hundred and sixty-five hours, modal number of hours being two hundred to two hundred and forty-nine (eighteen projects).

*Nebraska News Letter Number Nine, page three.

2. Fifteen potato projects had an average of one hundred and three hours, with a range of twenty to two hundred fifteen hours. The potato projects should be increased in size, if the minimum of one hundred eighty hours suggested as a desirable minimum by the State Supervisor of Minnesota is attained.
3. Sixteen Poultry projects had an average of sixty-nine hours, with a range of eighteen to two hundred fifty hours. Evidently many poultry projects are too small or "mother is tending the flock".
4. The average for eight wheat projects was one hundred seventy-four hours, with a range of sixty-three to three hundred fifty-four hours. Some boys should run the seeder and binder in addition to "shocking", ^{and}/"pitching off the load".
5. The average for the swine projects was one hundred seventy-two hours, with a range of one hundred to two hundred sixty hours. Some boys should do ^{more than merely}/"dumping swill to swine".
6. On one horse project of twelve horses, a boy put one thousand twenty-three hours.
7. On one dairy project a boy put two hundred thirty-six hours.
8. On one oats project a boy put one hundred ninety-five hours.
9. On one alfalfa project a boy put sixty-four hours.
10. On one beans project a boy put one hundred twenty hours.
11. On one buckwheat project a boy put forty-four hours.

13. On two tomato and canning projects girls put sixty and seventy-two hours.
13. On one soil analysis project a boy put sixty-two hours.
14. On one orchard project a boy put twenty-eight hours.
15. On seven garden projects, pupils put an average of one hundred thirteen hours with a range of thirty-two to three hundred hours.
16. The average for twelve boys in general farm practice was one thousand one hundred twenty-one, with a range of five hundred and eighty to one thousand six hundred thirty hours.

It is to be regretted that all instructors did not require more accurate records of project hours, many seeming to be mere guesses, if a comparison of acres or animals in project, cost of man labor, and other labor is made to note the probable number of hours spent upon projects. Some records evidently did not include project study, as called for on record blanks.

It is also to be regretted that all instructors did not make reports of project hours, this seemingly being considered a useless task by several instructors. The writer feels that such records will, as they accumulate, prove of great value in determining the proper size of project.

By referring to man hour requirements of units of production in farm management records, the instructor should be able to estimate rather closely the number of hours required for completion of a project, making due allowance for various conditions of age, sex, physical condition, and farm experience of pupil. To this it should be fairly easy to add the number of hours spent in study.

If a boy is not able to get a sufficient number of acres or animals for a project to make possible at least one hundred eighty project hours, he should be required to keep records of some phase of crop or animal production in which he may not have any financial or managerial interest. This is much to be desired in any case for the training and information involved.

"To occupy his time profitably for two hundred hours during not less than six months is desired. In case he has not ^{at} home sufficient resources and cannot find them in neighborhood, to make two hundred hours requirement, he may take up an enterprise which will provide for one hundred hours of unemployment and in addition do other farm work either at home or for hire to a total of two hundred hours."*

The writer believes that we have not reached the favorable situation for vocational agriculture when "the agricultural program should claim not less than twelve hundred hours yearly of which not less than three hundred will be required, in class work and labor attendance, leaving eight hundred to nine hundred hours for productive work on project." **

The three hundred hours may be easily required in the class room, but the labor hours on the farm may be hard to require, eight hundred hours meaning that half of the boy's time for six months, in a ten hour day would be given to his project under supervision. Not until the shortage of farm labor becomes less acute can we hope for such ideal conditions; if the project work can be put on a partnership basis, allowing for financial and managerial interest of the boy, Dr. Snedden's standard may be reached. But the writer

* Connecticut Bulletin 37, 18-19.

** Nebraska News Letter Number Nine, page two.

hopes that no fixed standard of project hours will ever be required.

Dr. David Snedden believes that "allowances must be made for these unhappy exceptions where substantial portion of boy's time seems mostly mortgaged to father".

"It was felt (by conference) that a liberal interpretation of this time requirement should always be made; but rather that this time element was intended to indicate some thing of the extent of the project to make sure that it should be a worth while undertaking for the boy."*

* Dr. David Snedden before National Society for Vocational Education at St. Louis (1919).

TABLE NO. 13

Size of Projects Planned by Pupils in Minnesota for
The Year 1918-1919.

1. Corn:

8 - 1 A.,	11 - 2 A.,	3 - 3A.,	2 - 4 A.,	30 - 5A.,
3 - 6 A.,	1 - 7 A.,	4 - 8A.,	10 -10 A.,	7 -20A.,
2 -30 A.,	4 the whole crop (no acreage given).			

Average for eighty-one projects---6.8 Acres.
2. Potatoes:

1 - Town Lot,	15 - One-half A.,	20 - 1 A.,
---------------	-------------------	------------

Average, eight-tenths Acre for thirty-six projects.
3. Small Grains:

3 - 2A.,	4 - 5A.,	8 - 10A.,	6 -30 A.,
1 -40A.,	1 - Whole Crop (no average given).		

Average, 11.8 Acres for twenty-three projects.
4. Beans:

Projects were all one acre in size.
5. Sorghum Cane:

One acre in size.
6. Alfalfa:

1 - 2 A., 3 - 1A., 1- 5A.; Average two acres for five projects
7. Gardens:

26 - Town Lot, 2-One-eighth A., 5 - One-quarter A.,
9 - One-half A., 2 - 1 A.;
60 per cent were on town lots;
Average, four-ninths Acre.
8. Orchards:

1 - 19 Trees, 1 - 20 Trees, 3 - 50 Trees, 1 -144 Trees,
1 - One-half A., 2 - 3 A.
9. Poultry:

12 - 100 eggs hatched,	1 - 150 eggs hatched,
1 - 250 eggs hatched,	1 - 3 hens and chicks,
1 - 10 hens and chicks,	1 ♀ 30 hens and chicks,
1 - 30 hens and 30 chicks,	1 - 40 hens and chicks,
1 - 50 hens and chicks.	

(Continued on next page)

(TABLE NO. 13, CONTINUED)

10. Swine:

20 - 1 brood sow and litter,
2 - 2 brood sows and litters,
1 - 4 brood sows and litters,
1 - 7 brood sows and litters,
1 - 10 brood sows and litters,
1 each of 1 pig, and two pigs, 4 pigs, 5 pigs.

11. Dairy Cattle:

1 - 2 cows,
3 - 6 cows,
1 - 7 cows,
1 - 10 cows,
2 - cow and calf,
3 - dairy herd.

12. Beef Cattle:

2 - one baby beef.

13. Horses:

1 - 12 horses.

(Data for the above figures taken from
the records in office of the State
Supervisor of Agricultural Education.)

CHAPTER VII.

LOCATION OF SMITH-HUGHES PROJECTS.

(a) Should project work in connection with vocational classes in agriculture be done on school plots or farms?

Of three thousand, four hundred and fifty-nine projects reported in 1918-1919 for twenty-nine states, (Table sixteen), 1/41 five per cent were located on school plots or farms. Of three hundred one projects reported for Minnesota for the same year only two per cent (six) were located on school plots.

These six school plot projects in Minnesota were as follows: Three boys, fifteen, seventeen and eighteen years of age, carried on jointly a project of two acres of corn and two acres of potatoes and secured a yield of fifty bushels of corn and twenty-three bushels of potatoes, at a cost of four dollars a bushel for corn and seventy-five cents a bushel for potatoes, with a net profit for the three project workers of Twenty-one dollars. They did not write any stories to record their improved (?) methods of farming.

Another pupil performed a garden project on a school farm at a loss of Three dollars.

The record does not show that two garden projects located on a third school farm were completed. No one can enthuse over the possibilities of training young people for farming thru such results obtained from project work on school farms. The proposition is so ridiculous and impossible that the writer feels that no further analysis of the situation is necessary. These cases should, of course, never have happened. The fault arose at the start in admitting pupils to a vocational class without some thought about the

opportunities at hand for these pupils to do project work of a worthy kind.

School plots have some value for other purposes, not within the limits of this study, but no instructor by using school plots for supervised farm practice can gain the support and confidence of the farmers of his community.

(b) Should pupils be permitted to undertake project work on a vocational basis on urban lots?

Of three thousand four hundred fifty-nine projects reported (Table sixteen)^{h. 11} as planned in twenty-nine states for the year 1918-1919, twenty-seven per cent were located on urban lots. Of three hundred one projects planned in Minnesota for the same year, twenty-seven per cent were similarly located. These projects were largely gardens and poultry production (see Table Nine, Selection of Projects).

If urban pupils are admitted to vocational classes of agriculture, the backyard and wood-shed are the logical solution of project facilities for them.

Yet Table sixteen shows that eight per cent of the projects in twenty-nine states and eight per cent of those in Minnesota for 1918-1919 were located on other farms, meaning on farms where pupils did not live. This shows that many town boys sought chances to put into practice what they had learned in school about scientific agriculture by getting jobs to work on farms. In those cases where the boys were permitted to keep cost records of the farming operations, or where they were permitted to manage any phase of farm work, the results were definite and satisfactory.

Some town boys worked on farms owned by their fathers

with full opportunity to "go it alone" in their project work. The story of the boy who with his brother rented a farm of eighty acres from his father is an interesting example of what a town boy can do for project work. His story follows:

"My father has a farm fourteen miles north-west of Pipestone, which consists of 624 acres. It seemed awfully hard to get a good renter for the farm, mainly because it was so large. So father a proposition to I and my Brother. He was to let each of us have 40 acres of land a peice, If we would carry on the farming for that year. I finally got interested in hog raising so I bought two Broodsows from father, he let me pick any two out of the herd that looked heavy with pig. I soon built a pen large enough for 2 hogs to exercise. I did not feed them very much, but I gave them all the milk they could drink. They soon showed signs of piging so I watched them very closely, so on May 15 one sow had a litter of 8 pigs and the next the other had 5 but one had probably been layed on and was dead. I then started to feed the sows corn and oat and milk, mixed. In about two week I turned them out in a small pasture bye the hog house. They done very well there and growed fast. And about the 25th I turned the sows and pigs out at large and they seem to do a great deal better at large. About Sept.1st I weaned the pigs and fened the sows up to be fattened. I feed them for about 2 week then sold them and sold my pigs the next day. The project work was very interesting. Besides my hog project I also raised 400 bu.of corn and about the same amt.of oat and also 35 bu. of potatoes. I was kept very busy but it surly was very interesting right from the beginning, to the end."

It is interesting to note for this project that, altho the boy lost Eighteen dollars on his pigs, he earned Six hundred dollars from his corn, oats, and potatoes.

It is hard to claim any vocational value in projects performed on town lots. Truck gardening and small fruit production on the outskirts of the village has vocational possibilities. Even poultry production under favorable conditions may arouse vocational interest. But family gardens, a dozen pullets, and a lonesome pig can hardly claim the attention of those interested in finding the natural setting for supervised practice in plant and animal production on real farms, not make-believe ones.

The town boy, who enters a vocational agriculture class, should thoroly understand that his enrollment is subject to the requirement that he work on a farm for one season, or under such natural conditions of producing farm products that his experiences will be of value to him in making the decision to become a producer of farm products.

The instructors who send their town boys into the country for vocational training have no prejudice against town lots. The lots helped out in time of war when food products were scarce. They should be continued in the mission of ministering to the needs of the family table. The boys and girls in the elementary school are encouraged to keep home gardens and poultry flocks by every instructor who likes young folks and realizes the value of keeping in touch with the homes of the taxpayers who are making it possible (in part at least) for him to put into full swing a program of developing a generation of farmers, vocationally trained. The town lot will seldom lead the boy to the farm. The doing of project work on farms has this possibility.

(c) How far from the school should the project be located?

From Table 16, we find that fifty-nine per cent of all projects reported for twenty-nine states in 1918-1919 were located within three miles, twenty-three per cent within six miles, thirteen per cent within fifteen miles, and five per cent beyond fifteen miles. The figures for Minnesota are, forty-seven per cent, thirty-two per cent, seventeen per cent and four per cent, respectively.

Tables seventeen, eighteen, ~~nineteen~~ show that three-fourths of the pupils lived within a radius of six miles of the schools. Table 18, for project workers in 1919-1920 shows that a smaller percentage of pupils live within one mile, twenty-three per cent as compared with thirty-eight and seven tenths per cent for the previous year. This is due to the large decrease in urban pupils enrolled for project work, as pointed out in the discussion of Table One, p. 26

More pupils planned to do project work who lived at greater distances from the school in 1919-1920 than in 1918-1919, twenty-five per cent and twenty-two per cent within three and one-tenth miles respectively, twenty-four per cent and seventeen per cent within six and one-tenth miles to fifteen miles respectively, and six and three tenths per cent and two and four tenths per cent, respectively, beyond fifteen miles.

The greater percentage for the last group, beyond fifteen miles, is due largely to the larger number of schools maintaining vocational agricultural departments in northern Minnesota, where pupils must travel long distances to seek high school train-

ing, especially in the northeastern section.

With the exception of the twenty-three per cent who live within the one mile zone and the six and three tenths per cent who live beyond the fifteen mile zone, the situation is very favorable for vocational agriculture. The project worker should live within easy reach of his project in order that he may, by performing as much of the work as possible, add to his skill in and information about the processes involved. But especially should he be in a position by personal observation of the conditions surrounding the progress of the project, to exercise whatever capacity for judgment and management which he possesses.

In the case of crop projects he may be able to begin and close the operations of his project while he is not attending school, provided the school season extends over a period of six months. If the boy in the nine months' course is excused from all school work during the time of seed selection, plowing, planting, harvesting, and marketing, the distance which he lives from school may not be a vital matter, provided the roads and means of transportation do not cause unnecessary loss of time and the instructor is able to supervise his project sufficiently.

If the boy selects an animal husbandry project, e.g., swine, involving the breeding of a sow in the fall, her care thru the winter until farrowing time in the early spring, the care of the litter from farrowing until weaning time, etc., he should be able to see his animals at frequent intervals, daily if possible, at the week end by all means. Thus his interest in the project can never flag, and in an equal way his interest in farming is becoming permanent. The boy must grip his project, ^{by} close contact if the farm is

to grip him. Table ^{p. 27} 2, shows that thirteen per cent of pupils living on farms return home at least at the week end.

The boy who lives at such a distance from school that he is unable to go to his home at the week end is under a heavy handicap, so far as the full benefits of project work are concerned. In addition to this, boarding life in the village or city may completely defeat one main objective of vocational agriculture, namely, tying the boy to the farm.

The department of vocational agriculture in a high school will be able to fulfill its mission if the project workers enrolled therein live within six, possibly ten, miles of the school, where roads are in fair condition for horse and buggy transportation; with improved roads and automobile transportation possible thruout the year, this distance may easily become twenty miles. The doing of project work at greater distance has doubtful value, altho this depends upon the spirit of the boy, the enthusiasm of the instructor and the attitude of the local people.

TABLE NO. 16

LOCATION OF HOME-PROJECTS.

State	Projects less than three miles from School	Projects-Three and less than six miles from School	Projects-Six & less than Fifteen miles from School	Projects-More than Fifteen miles from School.	No. Projects- Located on Home Farm	No. Projects- Located on other Farms	No. Projects- Located on School Farm	No. Projects- Located on Urban Lots
California	30	21	6		43		4	9
Colorado	17	18	28	3	41	11	11	3
Georgia	35	7	3		31	5		8
Illinois	61	57	41	1	115	2		23
Iowa	85	24	13		78	4	24	15
Idaho	52	10	13	4	64	5		10
Kentucky	106	51	31	7	161	15	1	18
Kansas	55	64	22	9	134	4	5	5
Louisiana	13	5	1		13		2	4
Montana	30	6	21	29	53	20		14
Massachusetts	76	7	4	3	53	32	3	4
Michigan	62	30	27	2	119	10	2	5
No. Dakota	45	24	26	58	104	22	21	4
No. Carolina	17	4	7		28			13
New York	71	87	16	2	161	12		2
New Jersey	12	12	12		34			543
Nebraska	655	68	36	5	169	7	45	3
Ohio	49	83	28	5	158	4		3
Oklahoma	28	2	1	1	10		19	
Oregon	14	21	10	3	47	1		10
Pennsylvania	13	18	11	2	34	1		60
So. Dakota	108	11	13	9	43	14	23	83
So. Carolina	235	145	20		314	3	22	15
Texas	56		3		34	6		
Utah	88	8	19	4	44	75		7
Washington	64	31	23	15	108	18		78
West Virginia	156	30	26	12	140	6		
Wyoming	10	14	1	5	30			
Wisconsin								
Total	2153	858	472	179	2061	277	182	939
Percent of Total	59.	23.	13.	5.	60.	8.	5.	27.
Minnesota	145	100	51	12	190	25	6	80
Percent of Total	47.	32.	17.	4.	63.	8.	2.	27.

Data from questionnaire sent out to instructors in May, 1919.

TABLE NO.17

DISTANCE OF PUPILS' HOMES FROM SCHOOL
MINNESOTA, 1918-1919

Towns	Miles	0.0-1	1.1-2	2.1-3	3.1-4	4.1-5	5.1-6	6.1-7	7.1-8	8.1-9	9.1-10	10.1-11	11.1-12	12.1-13	13.1-14	14.1-15	15.1-16	16.1-17	17.1-18	19.1-20	20.1-40	Total
1.	2			1					1	1	1				2		1					9
2.	3			2	1			2				1										9
3.	15	3	1	3	2	1			1		1			1		1						29
4.	2		1	4	1			1	1													10
5.	4	1	3				2															10
6.			1		4					1												6
7.	10	1							2													13
8.	3		2	4			1		2				1									13
9.	6	3	4	2	2			3			1	1										22
10.	6	1					1					1										9
11.	21			1	2	1																25
12.	12		1	2		1	1				1											18
13.	1	1	2		1	1																6
14.	1	2	2	7						1												13
15.	4	1		1	2	1	2	2						1		1						15
16.	8	3	3		1	1				1								1		1	1	20
17.	7		2	2		1	2	2	1	1												18
18.	10	1		6				1	1		1								(40)	1 over	1	21
19.	15	3	3	2																		23
20.		3	5	1		1	1						1								2	14
Total		130	23	30	38	16	12	13	12	5	6	3	2	2	2	2	1	1	2	1	1	303
% of Total		43	8	10	13	5	4	4	4	2	2	1	.6	.6	.6	.6	.3	.3	.6	.3	.3	-

Data from records in office of State Supervisor of Agricultural Education.

TABLE NO. 18

DISTANCE OF PUPILS' HOMES FROM SCHOOL, MINNESOTA, 1919-1920

Miles from School

Miles	0-1	1.1-2	2.1-3	3.1-4	4.1-5	5.1-6	6.1-7	7.1-8	8.1-9	9.1-10	10.1-11	11.1-12	12.1-13	13.1-14	14.1-15	15.1-16	16.1-17	17.1-18	18.1-19	20.1-21	24.1-25	25.1-26	Over 30	Over 40	Over 130
1.		3	2		1	1	1	2	1			2													
2.		1		2	1	1	1				1	1			2	3									
3.	1		1		1	2	1	2	2	1			1												
4.	3	1	1	1	1			1																	
5.	6	1		2		2																			
7.	10			1	1			2		1		1													
8.	3	3	2	4	3	1	2		1		2														
9.	3	1	1	1	2		1	3		1	2														
10.	3		2		1	2					2														
11.	7	3	1	3			1																		
12.	3		1	1					1							1									
13.	2	3	2	4	3	1																			
14.			4	3	1		2	1																	
15.	3	1					3	2		1			1												
16.	3	4		6				2									1								
17.	2		2		1		2	1	2	2														1	
18.	3	2		2		3		1					1												1
19.	5	6	6										1												
20.	6			2	2		1	1									1								
21.	1	2	1		3	2																			

(Continued on next page.)

TABLE NO. 19

DISTANCE OF PUPILS' HOMES FROM
SCHOOL.

A Summary and Comparison

Miles	Per Cent of Total Projects			United States 1918-1919
	Minnesota 1918-1919	Minnesota 1919-1920		
0-1	38.7	23.	((
1.1-2	8.3	11.	{- 45.	{- 58.7
2.1-3	10.6	11.	((
3.1-4	14.6	11.	((
4.1-5	3.5	9.	{- 25	{- 23.4
5.1-6	3.9	5	((
6.1-7	5.1	6	((
7.1-8	3.8	5	((
8.1-9	1.5	3	((
9.1-10	2.3	4))
10.1-11	1.1	1	{- 24	{- 12.8
11.1-12	.8	2))
12.1-13	.8	1	((
13.1-14	.9	.5	((
14.1-15	.4	1))
Over 15	2.4	6.3		4.8

TABLE NO. 20
 SIZE OF FARMS ON WHICH PUPILS
 LIVED IN MINNESOTA,
 1918-1919.

	Number of Farms	Acres	Total Acres
	15	2½	37½
	3	15	45
	6	25	150
	25	80	2000
	18	120	2060
	41	160	6560
	22	200	4400
	28	240	6720
	6	280	1680
	20	320	6400
	7	360	2520
	3	400	1200
	1	480	480
	3	560	1680
	1	600	600
	3	640	1920
	<hr/>		<hr/>
Total	202		38452
Average			190.35

Data from records of State Supervisor of
 Agricultural Education.

SUPERVISION OF HOME-PROJECT WORK

(a) When should supervision of project work begin?

The answer to this question would seem to be very easy.

Supervision should start when project work starts.

Instructors in Minnesota report for the year 1918-19 that, out of 247 projects, one project began in November, one in January, 14 in February, 28 in March, 105 in April, 56 in May, 4 in June, and one in July. It would seem that visiting should have started at least in February for those pupils who had animal projects like swine and poultry, that the visits should have increased in number in March when plant projects were added to animal projects, started that month.

Yet from table 24, in which are given the officially reported visits of each instructor by months of the year, we learn that no visits were made in February and that only one instructor reported visits during March.

Table 9, shows that all instructors except six had animal projects to supervise. Yet four of these instructors apparently did not find occasion to look into conditions surrounding animal production at close hand, even in the month of April. Practically all swine and poultry projects are reported as having been started by the month of April. One instructor, with five poultry projects to supervise, did not make a visit until the month of June. Of five instructors who had only plant projects to supervise, three made no visits until June, and one other instructor made only one visit in May.

It might be said that supervision started late because of the burdens of class work carried until June first. But the last

column in table 34^{h.iii} shows that five instructors, whose class work closed in March, did not make a visit in March or April. Four instructors whose class work closed in March, became busy at once, apparently, with project visitation, and one other instructor made several visits in the same month (April). Visiting of projects did not become general until June, when all schools were closed for the summer vacation.

Does this mean that supervision of projects must be delayed until class-room work is closed?

The object of project work would be entirely defeated if the answer to this question should be in the affirmative. But cannot the instructor keep sufficiently in touch with the project-worker without going to the farm? Nothing can take the place of a personal examination of all the conditions surrounding project work. The instructor needs to be in close touch with the actual happenings of the project, especially when the projects are getting under way.

A good beginning will give some assurance at least of a good ending. The instructor can do his most effective work in supervision when the workers are eager to begin and are aglow with interest and enthusiasm. An error committed at the start by the worker may absolutely kill any further effort. The initial steps in every project should be taken, if physically possible, under the close scrutiny of the supervisor. Previous instruction is valuable but instruction to suit immediate needs is invaluable. Telephone messages may avoid some mistakes, but personal messages appeal to the moral fiber. Reliance on parents' direction and neighbors' advice is no advance over long prevailing conditions of farm apprenticeship.

What hinders the earlier beginning of supervision? Certainly it is not the amount of class work required. In addition to an average of fifteen pupils for instruction in vocational agriculture, many instructors teach eighth grade agriculture twice a week for forty minutes, also teacher training classes for three months, usually during the winter months, and one or more classes of related subjects, like farm arithmetic, rural sociology, or community civics. If these related subjects are taught, usually only one year of vocational agriculture is presented. At any rate, each instructor is expected to be free to dismiss his classes at any time when it seems best for him to make a trip into the country to direct farm practice. No instructor is keeping the spirit of the Smith-Hughes Law when he lets class-room teaching interfere with the necessities of project supervision.

Bad roads of course will hinder supervision in the winter and spring, especially when it is noted that all instructors depend upon the automobile as a means of conveyance. But if the boy can reach the school under such conditions, surely the school district can afford to put at the disposal of the instructor the best means of conveyance available to meet road conditions.

It is for the instructor to realize the value of close supervision from the beginning of project work and to work out the difficulties of reaching the project locations. As the concept of project work grows to cover the whole cycle of production (e.g., seed selection to "hogging off" for corn, or breeding of sow to marketing of hogs) the time for beginning supervisory work in vocational agriculture will be looked upon as obligatory as soon as the boy has selected his project. This means that future reports should show a large number of visits during at least the fall months

for both plant and animal projects and a small number of visits during the winter months in the interest of the animal projects then in progress.

(b) How many visits should a supervisor make to each home-project?

The rules of the Minnesota Vocational Board require at least three visits per month for six months for each project. With this requirement as the basis of calculation, table 24, has been prepared to show the per cent of visits made by each instructor in Minnesota for the year 1918-1919. Column three shows that an average of 5.3 visits per pupil's project were made with a range of two to fourteen. Column six shows the per cent of required visits made, as reported, with an average of 29.1 per cent, and a range of 8 per cent to 80 per cent. For the month of September the least number of visits were made, five per cent, or an average of 2.1 for each instructor, and for the month of June the largest number, 48 per cent, an average of 19 per instructor.

Only one instructor visited the projects during October, two during September, ten during August, and fourteen during July. During one month only do the official reports show that instructors felt the necessity of visiting projects. Doubtless more visits than officially reported were made. It hardly seems possible that supervision would be regarded so unimportant that only six visits were made during the growing season. Yet it would seem that each instructor would be anxious to place himself on record as having made at least the required number of visits. It might not be surprising that he had not gone beyond this number in view of the cautions he may have received from local school authorities to ke

transportation expenses within reasonable limits.

Table 22¹⁹¹⁹ shows that all instructors except two owned their own automobiles (probably flivvers), that one of these two used the machine owned by the school, and the one hired either an auto or a horse and buggy for transportation.

Only one instructor reports a limit upon what he could spend for this purpose, namely, \$200, an adequate sum in this case, considering the fact that eighteen of the twenty-five project-workers lived within the limits of the village. The average mileage expense allowed for operation of autos was 9.8 cents, a generous arrangement when compared with the figures shown in table 23 for the allowances in other states, Only six reports showing higher allowances than the average in Minnesota. Instructors in other states were limited to as small amounts as \$50, and others to as high as \$250.

No instructor in Minnesota could plead that because he could not afford to operate his car on the mileage basis arrangement the number of his visits was necessarily limited. Table 23 shows that in other states only 11 per cent of the instructors operated their cars on the mileage basis, altho 73 per cent owned their cars, 9 per cent rode in school-owned cars, and 17 per cent hired conveyances.

Seven per cent of the instructors reported that the cost of transportation was added to their salaries, surely no great incentive for making a large number of visits, unless the additions were remarkably significant. No evidence has come to the attention of the writer that instructors in other states are paid higher salaries as the result of such additions for transportation expenses.

Apparently, Minnesota instructors enjoy salaries comparable to any state in the Union, altho no definite figures are available. Forty-five per cent of instructors in other states report that they paid all expenses of transportation, with no understanding about remuneration for the same. What the result would be upon the number of visits made is not hard to guess. This discussion of expenses is given to show that Minnesota was fortunate in the liberal policies established by school boards, as compared with conditions in other states. The writer would have enjoyed referring to the official records of visits in other states, but this was a pleasure not to be contemplated. By inference he is able to paint a doleful picture of young people launched upon financial enterprises at the instigation of their enthusiastic instructors, but left early in the season without encouragement or guidance from the same sources except as they could secure help by telephone or by taking instructors out to the projects behind old "Hells" or "Bills".

(c) Is the number of visits per pupil limited by the length of project-visitation circuits?

The last column in table 21, ¹⁻¹⁰⁵ shows that the average of such circuits for 1918-1919 in Minnesota was 69 miles, with a range of 28 miles to 150 miles. The first column in this table shows an average of 68 visits per instructor. Three instructors only with circuits less than the average length, exceeded the average number of visits made. The largest number of visits made, altho only 41 per cent of the required visits, is to the credit of an instructor with a circuit of 85 miles, the second highest number to one with a 60mile circuit. The instructor with the shortest

circuit, 38 miles, (a large number of urban pupils) made the smallest number of visits, 13. The highest per cent of required visits, 80 per cent, or the highest number of visits per pupil, 14, is noted for the instructor with a 115 mile circuit, the second highest for a 134 mile circuit. Apparently a reasonable length of project circuit is no deterrent to the number of visits possible for any instructor.

Another angle of this discussion of miles to travel in making visits to projects may be secured by referring to table 14. 58.8 per cent of projects in other states were located within three miles of the school, 47 per cent for Minnesota. This means that an instructor could reach about one half of the projects by walking to the same. 33.4 of the projects were located in the states between three and six miles from school, in Minnesota, 33.4 per cent, or within horse and buggy distance. 13.8 per cent of the projects in the states, 16.5 per cent in Minnesota, were between 6 and 15 miles from school, or automobile distance. Table 15, where actual distances are taken from official reports, shows a higher per centage of projects located within walking distance. The low average of visits made by some instructors is explainable in part when notice is taken in this table of the fact that some projects were located as far away as 18 to 40 miles. If projects were located on one road or in the same locality, the circuit was thereby reduced in length. If all projects could be visited on the same days, the expense of visiting would be thereby materially lessened, thus giving greater opportunity for increasing number of visits. But as shown above, the shortness of circuit did not seem to increase the number of visits.

(d) Should visiting projects cease when the critical phases have passed?

Apparently Minnesota instructors were of this opinion, judging from the figures given in table 24^{1/2}. Yet one instructor (one of the most faithful as to visits) stated to the writer that he made many visits of an unofficial kind later in the season, such as a neighbor would make, to see how the boy was getting on, to chat with him about things in general, without making the boy feel that he had received any definite information or instruction about his project.

It was the opinion of instructors gathered at a recent conference that visiting of an informal, friendly kind, associated with trips, picnics, club meetings, etc., were highly desirable for the welfare of the project-worker; that the instructor should win the esteem and confidence of the boy in order that in the final test of project work the boy may be made to appreciate, thru the viewpoint of the instructor, the dignity of farm labor and the joys of country life. The instructor who is satisfied to stop his visits at the point where he feels assured that the project will yield a financial return is missing the greatest satisfaction from his labor. It is to be hoped that school boards will be far-sighted enough to urge the continuance of visits, even when they become entirely social. It is not to be implied that all visits should not be friendly and informal and social. This should be a strong characteristic. But during the busy season of farm work, visits must necessarily be as brief as the necessities of the project problems will permit. Otherwise parents will give a cold shoulder to the visitor. The wise instructor will seek opportu-

ities to "get next" to the boy when the latter is off duty, at the meal hour, on Saturday evening, on rainy days when he comes to town, or on Sundays. It is highly desirable that instructors continue to visit, even after pupils have completed projects and received all the credit due them for their successful endeavors. The instructor who looks upon his job as akin to a pastoral visitor, with the vision of community uplifter and builder, has the desirable attitude toward the work.

(e) Should an instructor visit one project more often than another?

There is a suggestion in the figures of table 24, that some instructors rather perfunctorily undertake supervision, making the same number of visits to each project, regardless of the nature, emergencies, difficulties, accidents, etc., attendant upon the same, and ignoring the varying managerial ability and farm experience of the workers. It is easy to "hitch up" on a nice day and make visits to all projects. It is another matter to anticipate discouragements and trying days for the project-pupil by being on hand to lend the needed encouragement or to furnish the proper direction. Some projects require more instruction than others, e.g., a cultivated crop vs. a small grain crop. Animal projects will usually require more frequent visiting because of possible emergencies. Improvement projects, such as farm rotation systems, tile drainage systems, etc., demand a smaller number of visits. Visits should be made as often as the nature of the project and the characteristics of the boy require. To neglect to visit any project would be poor policy, at least. To visit projects, for policy's sake, is defeating the purpose

of project supervision. To get the "size" of the project and the project-worker and visit accordingly is the act of wisdom for every instructor.

TABLE NO. 31

LENGTH OF HOME-PROJECT SUPERVISION
CIRCUITS

Total Miles for Supervisor to Travel to Make One Visit to Each Project Pupil.

Miles	10-19.9	20-29.9	30-39.9	40-49.9	50-59.9	60-69.9	70-79.9	80-89.9	90-99.9	100-109.9	110-119.9	120-129.9	130-139.9	140-149.9	150-159.9	160-169.9	170-179.9	180-189.9	190-199.9	200-209.9	210-219.9	220-229.9	230-239.9	240-249.9	250-259.9	260-269.9	270-279.9	280-289.9	290-299.9	300-309.9	310-319.9	320-329.9	400-409.9	420-429.9	480-489.9			
California				1						1																												
Colorado								1																					1									
Georgia		2		1																																		
Illinois	1	1		2		1																														1		
Iowa		1	2		1																																	
Idaho					1							1																										
Kentucky		1		2						1					1																							
Kansas			1	1	1		1			1			1			1	1																					
Louisiana		1				1																																
Montana																																		1	1			
Massachusetts	1	1	2			1	1			1																												
Michigan			1																			1																
No. Dakota						1																												1				
No. Carolina	1		1					1																														
New York						2	1			1																												
New Jersey					1		1																															
Nebraska	2								1						1																							
Ohio		1		1	1			1		1								1		1									1					1				

(Continued on next page)

(Table No. 21 Continued)

	Miles	
Oklahoma	10 -19.9	
Oregon	20 -29.9	
Pennsylvania	30 -39.9	1
South Dakota	40 -49.9	2
So. Carolina	50 -59.9	
Texas	60 -69.9	2
Utah	70 -79.9	2
Washington	80 -89.9	1
West Virginia	90 -99.9	1
Wyoming	100-109.9	1
Wisconsin	110-119.9	
TOTAL	120-129.9	1
Percent of Total	130-139.9	1
Minnesota	140-149.9	0
Percent of	150-159.9	1
	160-169.9	1
	170-179.9	1
	180-189.9	2
	190-199.9	0
	200 -209.9	1
	210-219.9	0
	220-229.9	2
	230-239.9	0
	240-249.9	0
	250-259.9	0
	260-269.9	0
	270-279.9	0
	280-289.9	0
	290-299.9	0
	300-309.9	2
	310-319.9	0
	320-329.9	0
	400-409.9	1
	420-429.9	2
	480-489.9	1

Data from questionnaire sent to instructors in May 1919.

TABLE NO. 23

SUPERVISION OF HOME-PROJECTS
MEANS OF CONVEYANCE, MINNESOTA, 1918-19.

	Means					Ownership			Expenses Paid					Project Cir- cuit in Miles	
	Auto	Autocycle	Bicycle	Horse	Train	Instructor	School	Hired	Mileage	No. Amount	Yearly Amt.	To Salary	By Instrubr		Bills Paid
1.	x						x							x	70
2.	x					x					x				76
3.	x					x			10¢						150
4.	x			x				x						x	30
5.	x					x			10¢						40
6.	x					x			10¢						35
8.	x					x			10¢	and Garage Rent					65
9.	x					x			7¢						40
10.	x					x			8½¢						35
11.	x					x				\$200					
12.	x					x								x	
13.	x					x			10¢						60
14.	x					x			10¢						125
15.	x					x			10¢						90
16.	x					x			10¢						75
17.	x					x			10¢						85
18.	x					x			10¢						38
19.	x					x			15¢						100
20.	x					x			8¢						
Total	18			1		16	1	1			2			3	1104
Average									9.8¢						69 m.

Data from questionnaire sent to instructors in
May, 1919.

TABLE NO. 33

SUPERVISION OF HOME-PROJECTS----MEANS OF CON-
VEYANCE IN THE STATES--1918-19.

	Means						Ownership			Expenses Paid					
	None	Auto	Autocycle	Bicycle	Horse & Buggy	Train	Instructor	School	Hired	Mileage	Monthly Amount	Yearly Amount	To salary	By Instructor	Bills by Dis- trict
California		2					2						2		
Colorado		2					2		1	6¢	\$40			2	1
Georgia		3			1		2				\$15	1	3	3	1
Illinois	1	5		1	1		4		1					3	2
Iowa		4		1	1		2	2						2	2
Idaho		4			1		2		1					2	
Kentucky		7			1		7	1		7¢				1	4
Kansas		7		2			2							2	
Louisiana		2													1
Montana		2					4	1	1			3	1	2	3
Massachusetts		6				1	1		2	10¢					2
Michigan		5					3		1	7¢					2
No. Dakota		4					3		1	6¢					
No. Carolina	1	2					2					\$50		2	
New York		4					4		1			\$200			
New Jersey		2			1		1		2			\$50		2	1
Nebraska	1	4					3					\$50			
												\$5 a pupil)		8	
Ohio		9					9		1			1			1
Oklahoma	1				1					10¢					
Oregon		3					3			12¢					
										8¢-up to	\$30 a month)			1	
Pennsylvania		3					3					\$50			
												\$150			
So. Dakota	1	5			1		1	1	4		\$10			2	2
					1-Horseback									7	
So. Carolina		6	1		1	1	7							1	1
Texas	1	2			1		2		1	10¢	\$50				
Utah		2		1			2		2	10¢				1	1
Washington		3		2			2	3		10¢					
										10¢					
										6¢-up to	3000 m.			5	1
W. Virginia	2	4			2	1	3		2				1	1	
Wyoming		2					2		2				1		3
Wisconsin		4			1		3								
Totals	8	108	1	7	11	3	88	11	21	4	10	8	52	28	
% of Total	5.8	78	.7	5	8	2.1	73	9	17	11	3	9	7	45	25

Data from questionnaire sent to instructors in May 1919.

TABLE NO. 24

Visits of Supervisors to Home-Projects
in Minnesota. 1919.

	March	April	May	June	July	August	September	October	Total	Number of Pupils Visited	Average Visits per Pupil	Average Visits per Month	No. Visits required for 6 mo	% of required Visits made	No. Pupils completing Project	% Completing mos. classes
1.			18	22					40	(12) 11	3.6	20	198	20	11	100
2.			7	18	16	6			47	(9) 8	5.8	11.7	144	32	7	87
3.			21	19	16	27			83	(10) 29	2.8	20.7	522	16	19	65
5.				9	8	11			28	(10) 6	4.6	9.3	108	26	6	100
6.				12	18				30	(10) 7	4.3	15.	126	24		
8.	7	8	7	27	28				77	(9) 13	5.9	15.4	234	33	13	100
10.		3	12	16	16	24	23	21	115	(25) 8	14.	16.5	144	80	8	100
11.		10	11	32	15	18			81	(19) 21	3.8	16.2	378	21	18	86
12.		1	4	9	9				23	(19) 17	1.3	5.7	306	8	11	65
13.		6	12	12					30	(19) 6	5.	10.	108	28	6	100
14.		11	37	24	13	26	13		124	(24) 13	9.5	20.6	234	53	9	69
15.			1	23	34	14			72	(24) 15	4.8	18.	270	27	13	86
16.		9	25	24	6	1			65	(24) 23	3.8	13.	414	16	11	48
17.		18	11	28	20	28			105	(21) 18	5.8	21.	324	32	13	72
18.		6	34	31	18	57			146	(27) 20	7.3	12.2	360	41	13	65
19.			6	6					12	(18) 6	2.	6.	108	11	8	
20.		26	28	26					80	(18) 12	6.6	26.6	216	37	12	100
Total	7	98	226	338	223	207	36	21	1158	233						
Average	.41	5.7	13	19	13	12	2.1	1.2	68	13.7	5.3			291		

* Figures in parentheses indicate number of pupils enrolled for Project Work.
Data from records in Office of State Supervisor of Agricultural Education.

CHAPTER IX
COMPLETION OF HOME-PROJECTS

(a) How many pupils may be expected to complete project work?

Table Twenty-five shows that seventy per cent of the pupils in Minnesota for the year 1918-1919 completed their projects, with a range of thirty to one hundred per cent for the schools. This average may easily rise to eighty-five per cent, when greater permanency exists among instructors in their fields of work. One school made no reports because the department was discontinued in mid-summer. Another school made no reports because the instructor left his position in the fall without leaving adequate data for his successor. No account is made of these two schools in the final summary of this study.

Six instructors took up the work of their predecessors and did the best they could with supervision of projects. If these changes had been made earlier in the season, no doubt a higher percentage of completed projects would have been obtained.

Attention is called to Table Twenty-seven (visits of supervisors) which shows higher percentages of pupils completing projects for the reason that account is here taken of the pupils who dropped out of project work before visiting projects started.

(b) What causes may be expected to hinder a one hundred per cent completion of projects?

Some of the causes noted in Minnesota are of the kind to be found in other school work--moving out of town, dropping out of school to work for various reasons, indifference and lack of "stick-

to-it-ive-ness". One boy ran away from home. In one case the family separated.

There are also causes arising from farm conditions. In some cases farms were sold and the boys of course could not complete the projects. Some boys were attracted by high wages away from their project work. Some boys did not complete project work because of scarcity of labor on the farm. An adjustment of project work should be made to obviate this cause of failures, when the call for help is genuine.

The largest number of failures is due to urban pupils in the classes, thirty-five per cent of these pupils not completing projects in comparison with twenty-nine per cent for rural pupils (Table Twenty-eight for sixteen schools).

The giving of credits to seniors before completing project work was disastrous, nearly half of these failing to carry out the work as agreed.

Eighth grade pupils made a poor showing, only thirty-three per cent completing projects (Table Twenty-eight) page 130.

(c) When may a home project be considered completed?

Table Twenty-seven shows that out of two hundred and eight possibilities, one hundred seventy-seven financial summaries were given and one hundred fifty-two stories written, eighty-five and seventy-three per cent respectively.

The boys in general farm practice wrote few stories and gave no financial statements. The few boys who had planned to do general farm practice wrote satisfactory stories of their experiences.

It was not easy to get final reports from pupils who completed project work and later moved away. Some of the best instruc-

tors were unable to get reports from pupils who had completed the work but were too busy or indifferent about receiving school credit.

The holding of pupils to final reports is a safe rule. The pupil should be led to see the value of doing this, both to himself and to farming in general.

Records of projects properly made out should in time be of help to later project workers, to vocational teachers of agriculture, to county agents, farm management investigators, etc., provided, of course, that projects represent normal farm conditions.

(d) Should pupils be expected to complete the projects which they had originally planned to perform, or should they be allowed to make changes?

Fifty-six per cent of the projects in Minnesota in 1918-1919 were carried out as planned (Table Twenty-five). Fifteen projects were changed to plant projects, four to animal projects and twenty-four to general farm practice. Fourteen projects planned in connection with other projects were dropped.

The practice seems to favor some freedom in carrying out projects. This is proper, provided that such changes as are made improve conditions for project work rather than vitiate the spirit and letter of vocational training.

To purpose to do a definite project and to carry it to completion is recognized by psychologists as important in the learning process. (See discussion of this in Teachers' College Record XII, Number Four, September 1918, by W.H. Kilpatrick). If the boy is to make any decided progress in his work, he should make considerable study of his problems in advance. He will receive help from the general study required of all pupils, but he needs to go into all

the details of procedure and management that are peculiar to his project and his own conditions.

The ideal situation in vocational agriculture is for the pupil to plan his project early in the fall, give considerable time to a study of all the processes involved and problems of management, let this study motivate his interest in the projects of his classmates and the general class work, and then carry out the project according to plans. It is gratifying to note that some instructors appreciated the importance of holding pupils to a definite program and actually "made good" in this respect. Common sense took care of the exceptions made necessary in the application of this rule.

(e) What projects may be expected to show the highest percentages of completion?

Table Twenty-five shows that one hundred per cent of the following projects were completed (changes being accounted for);- buckwheat, sorghum cane, orchard, alfalfa, horses, silo construction, and soil analysis. So few projects of the kinds named were undertaken that no conclusion can be drawn concerning them. The other projects fall in the following order of per cents:- wheat ninety-three per cent (fifteen projects); poultry seventy-five per cent (twenty-six projects); corn seventy per cent (ninety-six projects); potatoes seventy per cent (thirty-two projects); general farm practice, seventy per cent (thirty-five projects); oats, sixty-seven per cent (three projects); tomatoes and canning sixty-seven per cent (three projects); dairy sixty-six per cent (six projects); garden sixty-six per cent (forty-four projects); swine fifty-five per cent (twenty-six projects); beans twenty-five per cent (four projects). One project each in strawberries, onions, clearing land and flax, and baby beef

were not completed. Eleven replanning farm projects were either changed to general farm practice or not attempted.

Small grains, poultry, corn, potatoes, dairy, and swine and garden projects are satisfactory projects, judged from the standpoint of completion.

Gardens are reasonably safe for urban boys and girls and rural girls. General farm practice makes a good showing only by reason of the fact that in the majority of cases credit was given for farm labor to save the situation for the boy. Beans, onions, and baby beef projects may make as favorable showing of completion as the others, no good reason appearing to the contrary.

TABLE NO. 25.

117

COMPLETION OF HOME-PROJECTS IN MINNESOTA

1918-1919.
(Eighteen Schools)

	1	2	3	4	5	6	7	8	9	10	11	12
	Total Number Planned	Number Changed to Other Projects	No. Changed to Animal Projects	No. Changed to Gen. Farm Prac.	No. Dropped as a Double Project	No. Completed as Planned (8 over 1)	Percent Completed as Planned	No. Completed for other Planned projects	Total No. of Attempts completed (S. & S.)	Total No. of Attempts	Percent of Attempts Completed (S. & S.)	No. Completed with financial loss
Corn	96	0		22		52	54	0	97	98	70	0
Potatoes	21	1	1	22	1	16	55	0	22	22	70	0
Oats	4	1			1	1	25	0	14	15	93	0
Wheat	17	1			1	13	76	26	24	44	66	0
Garden	44	1		2		25	57	0	1	4	25	0
Beans	2	1				1	50	0	1	1	100	0
Buckwheat	1					1	100	0	1	1	100	0
Sorghum Cane	1					1	100	0	1	1	100	0
Tomatoes	4	1		1	1	3	63	0	3	3	100	0
Orchard	6	1	1	1	1	0	0	0	1	1	0	0
Strawberries	1					0	0	0	1	1	0	0
Onions	1					0	0	0	1	1	0	0
Alfalfa	6				2	4	67	0	4	4	100	0
Clearing Land and Flax	1	0				0	0	0	17	1	35	0
Swine	30		1		4	17	56	0	20	22	73	0
Poultry	21	2		0		20	62	1	20	22	66	0
Dairy	11	1	1	0	1	3	27	0	0	1	0	0
Baby beef	1					0	0	0	1	1	100	0
Horses	1					1	100	0	1	1	100	0
Silo	1					1	100	0	0	0	0	0
Clover	1				1	0	0	0	0	0	0	0
General Farm Practice & Farm Accounts	11					4	36	19	23	25	79	0
Replan Farm	11			11		0	0	0	0	0	0	0
Soil Analysis	1					1	100	0	1	1	100	0
Total	219	15	4	24	14	179	56	26	213	208	70	16

Data from records in office of State Supervisor of Agricultural Extension.

TABLE NO. 27

HOME PROJECTS COMPLETED BY PUPILS IN MINNESOTA HIGH SCHOOLS
1918 - 1919

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
Corn	9	2	2	3	2			5	6	2	5		3	6	5	1	7	5		4	67
Wheat			1											4				5		4	14
Oats																		1		1	2
Garden			14					1	1		4	4				3		1	1		29
Potatoes					1					1	3	2				1	6	1	2	5	22
Alfalfa					1										2	1					4
Beans								1													1
Buckwheat														1							1
Sorghum Cane			1																		1
Tomatoes												2									2
Orchard					1																5
Swine	2	3	1					3			4		1					4			17
Poultry								3		5	2	1	1				3				20
Dairy											1		1			6	1		2		4
Horses																		1		1	1
Silo Construction																				1	1
General Farm Practice and Accounts		2		5	1				4		6				3		1	1			23
Soil Analysis															1						1
TOTAL	11	7	19	8	6	0*	0**	13	11	8	25	9	5	11	12	17	14	20	8	11	255

* Department discontinued

** Records not in

TABLE 27
 REPORTS OF COMPLETED PROJECTS TO STATE SUPERVISOR, MINNESOTA
 1918-1919

SCHOOL	No. Pupils Giving Financial Reports	Number Pupils Writing Stories	No. Pupils Reported Completing Projects	No. Pupils in Project Work	Percent Completing Project Work
1.	11	11	11	12	91
2.	7	5	7	9	77
3.	19	0	19	29	66
4.	3	5	8	10	80
5.	0	0	6	10	60
8.	13	13	13	13	100
9.	7	9	11	22	50
10.	8	7	8	9	90
11.	12	13	21	25	84
12.	8	0	9	19	47
13.	5	5	5	6	83
14.	11	8	11	13	85
15.	9	11	12	15	80
16.	17	16	17	24	71
17.	12	12	13	18	72
18.	17	19	19	21	81
19.	8	8	8	27	30
20.	9	9	10	14	71
Total	177	152	208	296	70

No reports sent in by schools 6 and 7.

Data from records in office of State
 Supervisor of Agricultural
 Education.

TABLE 29

PUPILS NOT COMPLETING PROJECTS IN MINNESOTA
1918 - 1919

	Number of Projects	Percent of Total Failures	Percent of Total Group
By urban pupils	29	35	35
By rural pupils	53	65	29
By girls (2 senior-rural, 1 junior -urban, 1 soph- omore-rural, 1 freshman-urban)	5	6	15.6
By boys	77	94	33
By 13 year old pupils	1	1	25
By 14 year old pupils	13	16	35
By 15 year old pupils	20	24	30
By 16 year old pupils	31	26	31
By 17 year old pupils	13	16	23
By 18 year old pupils	11	13	44
By 19 year old pupils	1	1	14
By 20 year old pupils	2	2	100
By 8th grade pupils	13	14	67
By 9th grade pupils	31	38	29
By 10th grade pupils	18	22	26
By 11th grade pupils	8	10	26
By 12th grade pupils	12	14	46
By Special pupils	2	2	15
By pupils 0 -1 miles away from school	43	51	43
By pupils 1.1-2 miles away from school	9	11	43
By pupils 2.1-3 miles away from school	4	5	15
By pupils 3.1-4 miles away from school	10	12	27
By pupils 4.1-5 miles away from school	2	2	22
By pupils 5.1-6 miles away from school	4	5	40
By pupils 6.1-7 miles away from school	4	5	31
By pupils 7.1-8 miles away from school	2	2	20
By pupils 8.1-9 miles away from school	1	1	16
By pupils 9.1-10 miles away from school	2	2	67
By pupils 10.1-11 miles away from school	1	1	50
By pupils 11.1-12 miles away from school	1	1	50
By pupils 13.1-14 miles away from school	1	1	50

Data from records in office of the
State Supervisor of Agricultural
Education.

CHAPTER X

HOME PROJECT RESULTS

(a) How far should the success of a project be judged by the results obtained in production (bushels, pounds, etc.)?

1. An average of fifty-nine bushels of corn was obtained for fifty-seven projects, with a range of nineteen and six-tenths to one hundred twenty bushels, modal number bushels forty to forty-nine, (sixteen projects)(Table Twenty^{p. 127})~~me~~The average yield of corn for Minnesota in the same year was forty bushels (reported by Professor Boss of Minnesota Experiment Station at Farmers' Short Course, December 1919). Seventy-five per cent of the yields in corn projects equalled or exceeded this average. This is a very satisfactory showing.

2. Fourteen potato yields averaged one hundred twenty-seven and eight-tenths bushels with a range of sixty bushels to two hundred sixty-four bushels (Table Thirty^{p. 130}). The Minnesota farm average for the same year (source above) was eighty-seven bushels. Seventy-one per cent of project yields equalled or exceeded this average. Unfortunately the potato project records for a northeastern school are not available. No doubt in this potato section the yields proved equally gratifying, and would have raised the average for the state.

3. Thirteen wheat yields averaged eleven and four-tenths bushels (Table Thirty^{p. 131}-one), not half bad when compared with the Minnesota average (source above) for the same year, nine bushels for spring wheat. Ten of the thirteen project yields equalled or

exceeded this average. Weather conditions affected two project yields two and eight bushels.

4. Fifteen swine projects showed an average daily gain of ninety-eighthundredths pounds, with a range of forty-three hundredths to three and one-quarter pounds, (the latter a single pig project by an urban boy). This is a satisfactory gain for pigs, according to Henry's Feeds and Feeding.

5. Fifteen poultry projects show an average of fifty-six per cent of eggs hatched, with a range of twenty-seven to eighty-three per cent. Nineteen projects show an average of fifty-eight per cent of chicks raised to maturity, with a range of thirteen to one hundred per cent. These averages seem to be fairly satisfactory, altho more experience with incubators and brooders should get better results.

There is no reason why the success of ^{the} project under proper instruction and supervision, with normal conditions prevailing, should not be judged by the results in production. To secure average results will always be satisfactory. To exceed the average should be the ambition of every red-blooded boy. Yet no instructor can safely exploit his project yields, obtained in one season's work, in the community, because the average farmer will put a question mark behind them. It is safer to let the boy do the talking about his results.

Favorable production results are not the only goal sought for but the fact remains that vocational instruction in agriculture will never receive the moral and financial support it needs and deserves if poor yields prevail.

(b) How far should the success of a project be judged by the cost of production per unit (bushel, pound, etc.)?

1. Fifty-one corn projects averaged fifty-four and two-tenths cents per bushel, with a range of nineteen cents to one dollar and thirty-six cents, modal cost forty to forty-nine cents (seventeen projects; Table twenty-nine) page 127.

The cost of producing a bushel of corn on Minnesota farms for 1918-1919 was about one dollar and thirty cents (figures from Professor Boss at Farmers' Short Course, December 1919).

Farmers would like to know how to produce corn at this low cost, for there would be a margin of profit at the price now prevailing (about one dollar and sixty cents). These figures did not, evidently, take into account all items of cost, nor cover the whole cycle of production, in addition too low a charge was made per labor hour of the boy, altho project workers earned men's wages in the regular work of the farm.

2. The average cost of producing potatoes for fourteen projects was fifty-three cents per bushel (Table thirty, page 128), with a range of eight cents to two dollars and fifty-six cents. Otto Berg, Superintendent of Grand Rapids Experiment Station, Minnesota, stated in a conference of agricultural instructors (April, 1920) that fifty cents is a proper estimate of the minimum cost of producing a bushel of potatoes at the present time. He spoke for the potato region, where machinery is being used by many farmers.

The cost of producing potatoes in Minnesota in 1919 was about sixty cents a bushel. Table thirty, page 130 (same source as for corn). Project boys were not far off in their figures for cost of producing potatoes.

3. The average cost of producing wheat (ten projects) was one dollar ^{and} ninety-five cents per bushel (Table Thirty-one). The Minnesota farm average for same year was about two dollars and forty cents, (Same source as for corn). The season was very unfavorable, low average yield making a high cost of production per bushel.

4. Fifteen swine projects averaged fifteen cents, range three cents to twenty-five and one-third cents, to secure a pound of gain in weight. ^{Table 32} The writer is unable to get an official estimate for swine costs. The feeling seems to prevail that no farmer can produce pork for less than fifteen cents, many preferring to get out of the business because of present market conditions (below fifteen cents, April 1920).

The above figures have been presented to show that it is possible for a boy in his project work to secure dependable cost accounts of production. Any wide deviations from average costs should be accompanied with full explanation of the conditions causing the same. It is fair to expect the boy to keep sufficiently accurate data that his cost of production per unit approximates the average cost on the farms of his section.

(c) How far should a project be judged for its success by the net profits thereof?

The average net profits of projects in Minnesota for the year 1918-1919 follow (Table Thirty-four), page 134.

Corn - Three hundred fifty-nine dollars (forty-two projects),
 Potatoes- One hundred forty-eight dollars (seventeen projects)
 Wheat - One hundred eighty-five dollars (thirteen projects),
 Orchard - Twenty-two dollars (four projects),
 Garden - Twenty-two dollars (twenty-four projects),
 Oats - Eight hundred eighty-five dollars (one project),

Swine - Sixty-nine dollars (five projects),
 Poultry - Thirty-three dollars (ten projects),
 Dairy - Two hundred fifty-nine dollars (two projects),
 Sixteen projects (seven per cent) were completed with a
 loss--potatoes (two), wheat (two), garden (two), buckwheat (one),
 swine (four), poultry (three); one orchard and one alfalfa project
 showed temporary losses.

Profits, of course, will vary, according to size, weather
 conditions, etc. It is highly desirable for the boy that he make
 some profit from his project. This is not the principal aim of
 vocational training but a useful means of arousing interest and
 an evidence of good management.

(d) How far should the success of a project be judged
 by its educational value?

The sentiment, unanimously expressed at all conferences
 of agricultural instructors, has been that the welfare of the boy
 and the effect of project work upon his future career should be
 the principal purpose and the end sought for in vocational train-
 ing in agriculture.

At one of these conferences the Director of Vocational
 Education in Minnesota, Mr. E.M. Phillips, marked a scoring blank,
 submitted to him as follows:

Scoring a Home-Project--Factors Considered.

1. Hours of study (not for recitations) ten points,
2. Hours of labor (on project only) ten points,
3. Yield per unit of production, ten points,
4. Net profit (on project only) five points,
5. Records (complete, neat, accurate, promptly rendered) ten
 points,

6. Story (thought, construction, neatness) five points,
 7. Degree of skill acquired, ten points,
 8. Management displayed, fifteen points,
 9. Better farming methods employed, fifteen points,
 10. General application and interest, ten points,
- Total, one hundred points.

He clearly has in mind the welfare of the boy when he assigns sixty-five points on the score to educational factors (5, 6, 7, 8, 9, and 10).

With this sentiment the writer is in most hearty accord. "To raise more corn to grow more pigs to buy more land" is not the end of vocational agriculture.

TABLE 29

CORN PROJECTS COMPLETED IN
MINNESOTA 1918-1919

1. (a) Number completed - 67
(b) Per cent completed - 70
2. (c) Number urban boys completing corn projects - 8
(d) Number rural boys completing corn projects - 58
(e) Number rural girls completing corn projects - 1
3. Age of pupils completing corn projects:
 - 2 - 13 years
 - 11 - 14 years
 - 16 - 15 years
 - 13 - 16 years
 - 13 - 17 years
 - 6 - 18 years
 - 2 - 19 years
 - Average - 15.7 years - (62 projects).
4. Size of farm on which corn projects were completed:
 - 1 - 50 Acres
 - 5 - 80 Acres
 - 1 - 100 Acres
 - 7 - 120 Acres
 - 1 - 132 Acres
 - 7 - 160 Acres
 - 2 - 180 Acres
 - 5 - 200 Acres
 - 10 - 240 Acres
 - 1 - 280 Acres
 - 1 - 300 Acres
 - 8 - 320 Acres
 - 3 - 360 Acres
 - 3 pupils on a school farm
 - Average 172 Acres (67 projects)
5. Size of project in acres:
 - 4 - 1 Acre
 - 11 - 2 Acres
 - 2 - 3 Acres
 - 1 - 4 Acres
 - 10 - 5 Acres
 - 1 - 7 Acres
 - 3 - 8 Acres
 - 10 - 10 Acres
 - 1 - 11 Acres
 - 1 - 13 Acres
 - 1 - 16 Acres

(Continued on next page)

(Table 29 Continued)

1 - 17 Acres
 1 - 18 Acres
 4 - 20 Acres
 1 - 22 Acres
 1 - 23 Acres
 2 - 30 Acres
 1 - 50 Acres
 1 - 55 Acres

Two acres jointly by three boys on school farm
 Average 9.4 Acres (67 projects).

6. Hours of study and labor on projects:

3 - 0-- 49 hours
 5 - 50-- 99 hours
 3 - 100--149 hours
 12 - 150--199 hours
 18 - 200--249 hours
 4 - 250--299 hours
 2 - 300--349 hours
 3 - 350--399 hours
 1 - 700--749 hours
 1 - 900--949 hours
 1 - 949-999 hours

Average 234 hours (53 projects).

7. Yield in production -- bushels per acre:

1 - 15 - 19.9 bushels
 1 - 25 - 29.9 bushels
 2 - 30 - 34.9 bushels
 3 - 35 - 39.9 bushels
 8 - 40 - 44.9 bushels
 8 - 45 - 49.9 bushels
 4 - 50 - 54.9 bushels
 5 - 55 - 59.9 bushels
 6 - 60 - 64.9 bushels
 5 - 65 - 69.9 bushels
 1 - 70 - 74.9 bushels
 5 - 75 - 79.9 bushels
 3 - 80 - 84.9 bushels
 2 - 100 - 104.9 bushels
 1 - 120 - 124.9 bushels

Average (actual) 59 bushels (57 projects).

8. Cost of production per bushel:

1 - 15 - 19.9 cents
 1 - 20 - 24.9 cents
 2 - 25 - 29.9 cents
 3 - 30 - 34.9 cents
 3 - 35 - 39.9 cents
 9 - 40 - 44.9 cents
 8 - 45 - 49.9 cents
 5 - 50 - 54.9 cents

(Continued on next page)

(Table 29 Continued)

4	-	60	-	64.9	cents
5	-	65	-	69.9	cents
3	-	70	-	74.9	cents
1	-	75	-	79.9	cents
2	-	85	-	89.9	cents
1	-	90	-	94.9	cents
1	-	105	-	109.9	cents
1	-	135	-	139.9	cents
Average (actual) 54.2 cents (51 projects).					

Data from records in office of
State Supervisor of Agri-
cultural Education.

TABLE 30

POTATO PROJECTS COMPLETED IN
MINNESOTA 1918-1919

1. Number completed - 32
Percent completed - 70
2. Number urban boys completing projects - 8
Number urban girls completing projects - 1
Number rural boys completing projects - 12
Number rural girls completing projects - 1
3. Age of pupils completing projects:
 - 5 - 14 years
 - 6 - 15 years
 - 4 - 16 years
 - 3 - 17 years
 - 1 - 18 years
 Average 15.4 years.
4. Size of farm on which potato projects were completed:
 - 1 - 26 Acres
 - 1 - 30 Acres
 - 1 - 38 Acres
 - 6 - 80 Acres
 - 1 - 100 Acres
 - 1 - 109 Acres
 - 1 - 160 Acres
 - 1 - 170 Acres
 Average 85 Acres.
5. Number of hours of study and labor on projects:

1 - 20 hours	1 - 24 hours
2 - 28 hours	1 - 76½ hours
1 - 86 hours	1 - 98 hours
1 - 100 hours	1 - 111 hours
1 - 130 hours	1 - 142 hours
1 - 150 hours	1 - 183 hours
1 - 156 hours	1 - 215 hours

 Average 103 hours.
7. Yields in production per acre:

2 - 60 bushels	1 - 79 bushels
1 - 80 bushels	1 - 109 bushels
1 - 110 bushels	1 - 120 bushels
1 - 121 bushels	11 - 132 bushels
1 - 141.3 bushels	1 - 150 bushels
1 - 170 bushels	1 - 195 bushels
1 - 264 bushels	

 Average 127.8 bushels.
8. Cost of production per bushel:

1 - 8 cents	1 - 19 cents	1 - 23 cents
1 - 24 cents	1 - 28 cents	1 - 35 cents
1 - 36 cents	1 - 45 cents	1 - 47 cents
1 - 48 cents	1 - 54 cents	1 - 60 cents
1 - 61 cents	1 - \$2.56	

 Average 53 cents.

TABLE 3:1

WHEAT PROJECTS COMPLETED IN MINNESOTA
1918-1919

1. Number of projects completed - 14
 Per cent projects completed - 93
 Number completed by rural boys - 13
 Number completed by urban boys - 1
2. Age of pupils completing wheat projects:

1 - 13 years	4 - 15 years
6 - 16 years	2 - 17 years
1 - 18 years	

 Average 16 years (14 pupils)
3. Size of farms on which wheat projects were completed:

1 - 140 Acres	4 - 160 Acres
1 - 190 Acres	2 - 200 Acres
1 - 220 Acres	2 - 240 Acres
1 - 320 Acres	1 - 640 Acres

 Average 233 Acres (13 farms).
4. Number of hours of study and labor on projects:

2 - 63 hours	1 - 98 hours
1 - 125 hours	1 - 211 hours
1 - 212 hours	1 - 269 hours
1 - 354 hours	

 Average 174 hours (8 pupils).
5. Size of projects in acres:

1 - 6 acres	4 - 10 acres
1 - 12 acres	1 - 16 acres
1 - 19 acres	4 - 20 acres
1 - 28 acres	1 - 15 acres

 Average 15 acres (14 projects).
6. Yields in production--bushels per acre:

1 - 2 bushels	1 - 8 bushels
1 - 10 bushels	3 - 11 bushels
1 - 12 bushels	2 - 13 bushels
2 - 14 bushels	2 - 15 bushels

 Average - 11.4 bushels (13 projects).
7. Cost of production per bushel, in cents:

1 - 91 cents	2 - 1.31 cents
1 - 1.55 cents	1 - 1.59 cents
1 - 1.72 cents	1 - 1.79 cents
1 - 251 cents	1 - 268 cents
1 - 508 cents	

 Average \$1.95 (10 projects).

TABLE 32

SWINE PROJECTS COMPLETED IN MINNESOTA
1918-1919

1. Number of projects completed - 17
Per cent of projects completed - 55
2. Rural boys completing swine projects - 11
Urban boys completing swine projects - 6
3. Age of pupils completing swine projects:

1 - 14 years	5 - 15 years
6 - 16 years	3 - 17 years
2 - 18 years	
4. Number of pigs (including sow) cared for in projects:

1 - 1 pig	1 - 2 pigs
1 - 3 pigs	2 - 5 pigs
3 - 6 pigs	1 - 7 pigs
1 - 8 pigs	1 - 9 pigs
1 - 11 pigs	2 - 12 pigs
1 - 18 pigs	1 - 20 pigs
1 - 28 pigs	

Average 8 pigs.
5. Hours of study and labor on projects:

2 - 100 hours	3 - 200 hours
1 - 120 hours	1 - 150 hours
1 - 160 hours	1 - 230 hours
1 - 260 hours	

Average 172 hours.
6. Daily gain in weight of pig in pounds:

1 - .43 pounds	1 - .5 pounds
1 - .54 pounds	1 - .73 pounds
2 - .8 pounds	1 - .82 pounds
1 - .83 pounds	1 - .89 pounds
1 - .9 pounds	3 - 1 pound
1 - 1.29 pounds	1 - 3.25 pounds

Average .98 pounds.
7. Cost of pounds gained in weight of pigs, in cents:

1 - 3 cents	1 - 8 cents	1 - 10 cents
1 - 11.5 cents	1 - 10.9 cents	1 - 14 cents
2 - 15 cents	1 - 16 cents	1 - 17 cents
1 - 17.5 cents	1 - 20 cents	2 - 21 cents
1 - 25 1/3 cents		

Average 15 cents.

TABLE 33
POULTRY PROJECTS COMPLETED IN
MINNESOTA 1918-1919

1. Number of projects completed - 20
Per cent of projects completed - 75
2. Rural boys completing poultry projects - 5
Rural girls completing poultry projects - 5
Urban boys completing poultry projects - 9
Urban girls completing poultry projects - 1
3. Age of pupils completing poultry projects:

1 - 13 years	3 - 14 years
4 - 15 years	3 - 16 years
7 - 17 years	1 - 18 years
1 - 19 years	

Average 15 years.
4. Per cent chicks hatched per project:

1 - 27 Per cent	1 - 28 Per cent
1 - 31 Per cent	1 - 32 Per cent
1 - 33 Per cent	1 - 40 Per cent
1 - 51 Per cent	1 - 55 Per cent
1 - 66 Per cent	1 - 67 Per cent
1 - 77 Per cent	2 - 68 Per cent
1 - 79 Per cent	1 - 80 Per cent
1 - 83 Per cent	

Average 56 Per cent.
5. Per cent of chicks raised per project:

1 - 13 Per cent	1 - 18 Per cent	1 - 17 Per cent
1 - 31 Per cent	1 - 35 Per cent	1 - 42 Per cent
1 - 43 Per cent	1 - 45 Per cent	1 - 51 Per cent
1 - 65 Per cent	2 - 70 Per cent	1 - 75 Per cent
1 - 77 Per cent	1 - 80 Per cent	1 - 87 Per cent
2 - 94 Per cent	1 - 100 Per cent	

Average 58 Per cent.
- *6. Number of eggs for hatching per project:

1 - 65 eggs	1 - 90 eggs	1 - 100 eggs
1 - 125 eggs	1 - 115 eggs	1 - 126 eggs
1 - 128 eggs	1 - 140 eggs	1 - 160 eggs
1 - 167 eggs	1 - 509 eggs	

Average 136 eggs.
7. Cost of Producing one dozen eggs in cents:

1 - 8 cents	1 - 32 cents	1 - 35 cents	1 - 39 cents.
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8. Number hours of study and labor per project:

1 - 18 hours	1 - 19 hours	1 - 20 hours	1 - 21 hours
1 - 25 hours	1 - 30 hours	1 - 35 hours	1 - 44 hours
1 - 45 hours	1 - 47 hours	1 - 48 hours	1 - 63 hours
1 - 180 hours	2 - 250 hours		

Average 69 hours.

TABLE 34
PROJECT PROFITS IN MINNESOTA
1918-1919

No. Projects per School	Corn	Potatoes	Wheat	Orchard	Garden
9	\$995.70	1 \$11.25	1 \$186.30	1 \$22.19	14 \$309.89
2	272.83	2 10.25	4 205.34	1 21.20	1 21.05
2	490.32	1 45.00	4 737.32		5 80.78
3	1098.45	6 389.10	4 1277.95	2) \$43.39	3 106.09
2	840.95	2 31.80	13) \$2406.91	Average-	1 101.25
6	1049.36	5 1420.04	Average-	\$21.69	24) \$519.06
6	3419.17	17) \$2507.44	\$185.14		Average--
10	3194.20	Average--			\$21.63
2	294.20	\$147.50			
6	3154.00				
4	358.35				
42)15078.07				
	Average \$359.00				
No. Projects per School	Dairy	Poultry	Swine	Oats	Buckwheat
1	\$ 95.16	1 \$ 7.14	1 \$ 75.80	1 \$885.80	1 \$62.53
1	422.76	1 62.05	3 249.60		
2)\$517.92	6 15.64	1 19.97		
	Average-	2 248.50	4)\$345.37		
	\$258.96	10)\$333.33	Average-		
		\$33.33	\$69.07		

DATA from records in office of
Supervisor of Agricultural
Education.

CHAPTER XI.

A SUMMARY AND PREDICTION.

The typical home-project worker in Minnesota for the year 1918-1919 was a boy, sixteen years of age, in the ninth grade of school, whose home was on a farm of one hundred and sixty acres, located within three miles of the school.

In a class of sixteen members studying farm crops for six months, he preferred to study and perform the operations of corn-production; or in an animal husbandry class, he favored the planning and execution of either a poultry or swine project.

This project-worker was one of eleven (class of sixteen) who completed his project, and one of nine who completed it as planned.

This typical project-worker completed his project with two hundred and thirty-four hours of study and labor on a sufficiently large basis to report records of production which compared favorably with the experiences of Minnesota farmers. The project was supervised by a graduate of an agricultural college, whose five visits to the project during the summer months were made in his automobile on a mileage basis of nine cents, allowed by the local school board.

Vocational agriculture was taught to three hundred and fifteen pupils in twenty schools in Minnesota for the year 1918-1919, with the results given in this study. That the five hundred and eighty-four pupils in forty schools of the state will make an equally favorable showing for the year 1919-1920 seems assured.

Few precedents existed to show the way in 1918-1919. That such favorable results were obtained is due to the interest of the

pupil, the enthusiasm of the instructor and the careful supervision of the state supervisor,

The home-project has great possibilities as a basis for teaching agriculture. No subject lends itself more easily to this method of instruction. But many problems must be solved before the best form of home-project work has been determined.

The writer feels that improvement lies along the following lines:

1. Limiting project work largely to rural boys,
2. Selecting the project earlier in the school year,
3. Extending the project-period to cover the whole cycle of production,
4. Increasing the size of the project in number of acres or animals, etc., within a reasonable limit.
5. Securing the cooperation of parents in giving greater managerial and financial interest in the project to the pupil.
6. Making the conditions for supervision of home-projects as favorable as possible, to increase the number and value of visits of supervisor.
7. Improving the facilities and materials for study of the project processes in the class room. (This topic has been omitted from the study).
8. Securing the interest and cooperation of all individuals and organizations of the community and state in home-project work as an effective means of attacking the rural life problem.

9. Giving such inducements to graduates of agricultural colleges trained technically and professionally for home project instruction and supervision, that they will link their interests with the welfare of the rural boys of one community for a period of years.

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