

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 Harry Benjamin Smith 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.

L D Coffman
Chairman

Andrew Ross

.....1916

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 Harry Benjamin Smith 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

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L D Coffman

Chairman

Audrey Ross

ORGANIZATION AND PRESENTATION
OF AN
AGRICULTURAL CURRICULUM
for a
RURAL CONSOLIDATED SCHOOL

A Thesis Submitted to the Faculty
of the
Graduate School
of the
University of Minnesota

by

Harry Benjamin Smith

UNIVERSITY OF
MINNESOTA
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In partial fulfillment of the requirement
for the degree of
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THE ORGANIZATION AND PRESENTATION OF AN
AGRICULTURAL CURRICULUM FOR A
CONSOLIDATED SCHOOL

It would seem unnecessary to spend time in arranging an agricultural curriculum for a consolidated school in the year 1919, when so much has been written on the subject of agriculture in rural schools. There is, however, a wide divergence between what is written and what is practiced. At least, that was my conclusion after taking several trips and visiting a number of consolidated schools in different states. Often the schools seemed good but I came away disappointed, because most of them were patterned after the old traditional town school and were not meeting the needs of their communities from the social standpoint.

Thru county superintendents of my acquaintance and other county superintendents in different agricultural states I got in touch with many other of the more progressive consolidated schools and found that my visiting experience was borne out by my correspondence. Accordingly I came to the conclusion that a majority of the rural consolidated schools were not attempting to socialize their curricula in order to meet the needs of their communities. I found many rural consolidated schools that gave no agriculture at all in their curricula; others that gave it only in the grades; others that gave it only in the high school; and the rest, a minority, gave it in both grades and high school.

It is my opinion, therefore, that a comparatively small percent of rural consolidated schools are giving agricultural instruction to meet the vocational needs of their students. Most of the schools, giving agriculture in their curricula, give it more in the

nature of an academic subject of interest only as general information and of no particular vocational importance. The slowness of the movement in the socialization of consolidated schools is due to the feeling among the farmers and even among many rural teachers in agricultural states, that agricultural work in the grades and the high school is not worth while. They feel that the children know all the agriculture they need and that it is precious time wasted to teach it in the schools. In fact, in many communities the prejudice is so strong against such instruction that earnest teachers become discouraged in their attempts to vitalize their schools by connecting them with the every day life of their pupils. One must conclude that there is a problem worth the solving, a practical solution of which is much to be desired. There is a great need of a curriculum that will prove practical for a consolidated school.

The curricula of many consolidated schools of today are anomalous, that is the high school curricula are being ruralized but the programs for the grades are being left much as they were quite traditional in character. Now at least seventy-five per cent of the children never go further than the grades, therefore, it becomes important to give the pupils in the grades some training along agricultural lines so as to make their rural life mean more to them.

There is no doubt that a modern, rural consolidated school, in order to be a community school, should provide for agricultural instruction all the way thru the grades and the high school.

Of course in the lower grades we would not call it agriculture but nature study. This nature study, however, would have to be an improved nature study that would lay the foundations for the later work in agriculture. Such a school, situated in a farming community,

should arrange its program so as to fit its ^{pupils} for the vocation that a majority of them will follow; such a curriculum is just as necessary for a rural community as a "vocationalized" curriculum is for a city.

The problem, then, that I have set myself, is to arrange a curriculum that will lay hold of a primary child in the consolidated school and will grip him as he advances thru the grades and the high school. It must be a broad program, because the farmer of the future must be well informed in order to be able to get an adequate return on his high priced land, and because a certain proportion of the children will leave the farm to find employment in the city and these must be properly trained to make a success of life.

AGRICULTURAL CURRICULUM FOR GRADES

A. Primary Department

I. Agricultural Nature Study

1. Plants

- a. Flowers- Kinds, colors, slipping
- b. Trees- Kinds, leaves, bark, shape
- c. Vegetables

2. Animals

- a. Farm Animals- Kinds
- b. Birds- good neighbors and bad
- c. Others- Insects, flies, toads--Friends and Enemies

II. Hand Work

Cutting, drawing, modeling, window gardening, and sand table decoration

III. Language

- 1. Oral- Home and field stories
- 2. Stories and poems from readers--Rural atmosphere

IV. Social

- 1. Room Cooperation - window box
- 2. Hiawatha Stories - corn to man
- 3. Sanitation - Fly

B. First Intermediate

I. Agricultural Geography

1. Agriculture

- a. Animals- Domestic - Breeds, Wild, Birds and Insects
- b. Plants- Flowers- Cultivated, wild

- c. Plant Production- Soil, Air, Heat,
Moisture, Light

- 2. Geography

- a. Sketching- School Yard, Farmstead and Farm
- b. Day and Night- The Seasons

- II. Hand Work

- Drawing, Moulding, Cutting, Weaving, Sand Table Work

- III. Language

- 1. Oral- Flowers, Birds, Animals, Stories with agricultural significance from prose and poetry
- 2. Written- "Stories" about birds and animals

- IV. Social

- 1. Room cooperation in Window and Wild Flower Garden
- 3. Human Needs- Foods, Clothes, Shelter, Transportation

- C. Second Intermediate

- I. Elementary Agriculture and Correlated Work

- 1. Agriculture

- a. Weeds and Weed Seeds
 - b. Grains and Forage Plants and Seeds and Seed Testing
 - c. Potatoes and Vegetables
 - d. Soils- Kinds, Formation, Adaptability, Care, U.S. Soil Areas

- 2. Geography

- a. Products of other countries according to climate and soil
 - b. Original Homes of Farm Animals
 - c. Product and Soil Maps

II. Hand Work

1. Wood-work- Simple, useful articles
2. Weaving and Braiding- Rugs
3. Rope Work- Knots and Splices

III. Language

1. Oral
 - a. Reports on Experiments and Observations
 - b. Prose and Poetry with Rural Atmosphere
2. Written
 - a. "Stories" on Agricultural Subjects

IV. Social

1. Community Work- Seed Testing
2. Intercommunication- Transportation

V. Industrial History

Biography- Stories of Inventors

D. Advanced Grades

I. Elementary Agriculture and Geography

1. Climate
 - a. Causes
 - b. Effect on products
 - c. Connection between climate and products of a country
2. Field Crops- A particular crop studied
3. Farm Animals- Studied in connection with project work

II. Hand Work- Wood Work- practical, useful problems

III. Language Work

1. Oral- Selections with an Agricultural Bearing
2. Written- "Compositions" correlated with Agricultural Work

IV. History- Emphasis placed on Agricultural Development and History of the U. S.

V. Social-

1. Cooperation- Seed testing, Cow testing
2. Sanitation- Care of milk, Diseases, Bacteria

FOUR YEAR HIGH SCHOOL CURRICULUM

FIRST YEAR

First Semester

- I. Field Crops
- II. Drawing, Forge, Soldering
- III. English
- IV. Farm Arithmetic and Book-keeping

Second Semester

- I. Field Crops
- II. Drawing, Leather, and Concrete
- III. English
- IV. Biology or General Science

SECOND YEAR

- I. Animal Husbandry
- II. Drawing and Special Problems
- III. English, Business Forms, and Letters
- IV. Biology, General Science, or Algebra

- I. Animal Husbandry
- II. Special Problems in Carpentry
- III. English, Business Forms, etc.
- IV. Algebra or Industrial History

THIRD YEAR

- I. Horticulture, Gardening and Fruit
- II. Chemistry
- III. English or Foreign Language
- IV. Foreign Language, Industrial History, Geometry, or Typewriting

- I. Dairy Husbandry or Business Law
- II. Chemistry
- III. English or Foreign Language
- IV. Foreign Language, Industrial History, Geometry, or Typewriting

FOURTH YEAR

- | | |
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| I. Soils | I. Farm Management |
| II. Agricultural Engineering | II. Farm Machinery and Farm Motors |
| III. American History and Civics | III. American History and Civics |
| IV. Foreign Language, English,
Business Law, or Rural Sociology | IV. Foreign Language, English, Business
Law, or Rural Sociology |

NATURE STUDY--AGRICULTURAL WORK IN THE FIRST AND
SECOND GRADES

In the majority of consolidated schools these two classes would be together in the same room; so the work would have to be arranged accordingly. The object of this work is to bring the home and the out-doors into the school room. The child is familiar with many common objects in his environment and has a vocabulary of several hundred words, all of which he has acquired within five or six years of his eventful life in the home. The big problem that the teacher faces is to use all of this accumulated knowledge and tie the school life to it. The old way in the rural schools was to put a primer into the hands of the child, point out the "A, B, C's and spell out the words from the beginning. The rest of the time the poor child sat and swung its feet or slept with its head on its arms. Conditions are somewhat improved; but, if you were a rural supervisor, you could find many a school with the conditions little different from the old days. The teacher is busy with the older children and hates to take the time for the beginners, who, from the point of view of the poorly prepared rural school teacher, are hard to teach. Today, however, in the better one room rural schools, the beginners recite six or seven times a

day and are given busy work the rest of the time; their recesses are longer; they have more time to play and school is more attractive.

In the consolidated school where the little folks are all in the same room, the teacher can take advantage of their fund of knowledge and it is often surprising how much they have acquired. As the outline indicates, I would start with a discussion of flowers. In most schools on the first day of the fall term there would be a number of bouquets of flowers brought in. Some of the bunches might be opened and the different kinds of flowers separated and named.

The room should have window boxes ready filled with dirt for the planting of slips and plants. The teacher should have provided herself with a geranium plant or a small fern to set out in the window box. She should explain how careful one has to be with a plant so as not to harm the roots; then she should set out the plant in the box very carefully and ask each child to have his mother send a plant from home for the window box, cautioning them to carry it very carefully.

There will be many different flowers come in during the first week or two, as the frost may threaten and the mothers will be glad to send them. These should be named and identified occasionally, together with the colors of the blossoms. Different children should be appointed each week to help take care of the flower boxes in order to develop responsibility and to increase interest. These flowers and their care can be made the subject of oral language work. Their need for water, air and sunshine can be brought out, thus early laying the foundation for later agriculture work.

During the flower work I should gradually introduce the study of birds, starting with the humming-bird, who flutters about the flowers. Then I should identify as many birds as possible through pictures and on walks. During the first weeks of school these walks should be quite frequent, as they will give the necessary opportunity to observe flowers, plants, trees, birds, insects, and other animals. In these walks, old birds' nests may be discovered, autumn flowers and leaves gathered, toads, frogs, and insects found, calves, colts, and lambs seen, and many wonderful things talked about. Think of the opportunity for oral language work! The common trees should be identified both by leaves and by bark, that is, by shape and trunk. Butterflies should be watched and the pretty milk weed caterpillar should be brought into the school room with the necessary food and placed in a glass covered box, so that it can go on growing, until it is ready to change into a chrysalis and then, kept until it changes into a beautiful varicolored butterfly. Any insects or cocoons that are brought in should be identified in general, their common names given and their life history touched upon, so that the children might know whether they are good or bad, helpful or harmful. This phase of the subject should be developed with the birds as well as the plants and the insects, possibly the good and the useful being emphasized more than the bad and the harmful. The wren, the robin, the quail, together with the many other good birds being commended and their protection advocated. The toad, the frog, the lady bug, and the earth worm being held up as good neighbors and helpful farm friends and therefore worthy of consideration.* An opportunity is offered at

*Comstock, A.B. HandBook of Reference & Nature Study Book, p. 181-189, 413-15, 726-503.

this point for the first lesson on farm sanitation in the discussion of the fly, how it breeds in filth and carries disease on its feet. It would be well to exhibit the different phases in the life history of the fly, telling something of its work in carrying germs.

All of this work must be started during the first two months of school before the flowers, birds, and insects have gone. It should be a period of wonderful interest and pronounced growth among the children. This, however, will depend largely upon the preparation of the teacher. The teacher in the primary department of the consolidated school should have special preparation along all of these lines as well as in ordinary primary methods, as the success of this fundamental agricultural work depends upon a broad knowledge of the natural sciences as well as on a thorough training in primary methods. The child's home experiences and surroundings must be used and can be utilized to advantage by an original, resourceful teacher.

During the winter, fruit and vegetables may be brought to school, talked about, and then cut out of paper and colored to represent the originals. Much interesting work can be done in the cutting of household utensils as skillets, rolling pins, wash boards, or tools as hammer, plow, shovel, etc. It is remarkable what realistic results some children are able to attain in their cutting, doing much better than the teacher can do herself. In a consolidated school last year I saw an exhibit of free hand cuttings to represent the program of the week, in the home, such as wash day, ironing day, sweeping day, baking day, etc. The collection was very interesting and original and very well done, so that one could easily recognize the clothes line with the clothes, the tub, wash board,

stove, etc. Think of starting rural sociology that far down in the grades; and yet that was what that teacher was doing.

If clay is available, modeling of vegetables and animals may be carried on to an advantage. In this connection comes in the use of sand tables and their wonderful possibilities in representing the farmstead with pumpkins for Hallowe'en, the Pilgrims and the Mayflower for Thanksgiving, Hiawatha and his wigwam to illustrate the story of the gift of corn to man. All these things and many more, such as agricultural conditions in Holland, may be shown on the sand table. The latter stories are second grade stories but work in nicely for all of the little folks in the room. Pupils do not mind repetition, if there are frequent changes, so, even if they do see the Hiawatha pictures and hear the stories and songs during the first year, they are just as keen for them in the second grade as they were before.

In many of the standard sets of readers, rural life stories are to be found and may be emphasized, as, "Little Boy Blue", "Little Bo Peep", "Hey Diddle Diddle", "Which Ever Way the Wind Doth Blow", from the Young and Field First Reader. With the latter story the cardinal directions might be taken up. These are important because they come up later in their agricultural geography work. This work ought to be taken up by December, so as to bring in the motion of the sun and the succession of day and night. A little poem to go with this, "Sleep Baby Sleep", is found in the Art-Literature Reader (1) or in Young and Field (3).

The work in the first two grades is so rich in material that can be used to carry out the rural idea and prepare the child for

later agricultural study and the enjoyment of the farm work, that it is hard to leave it. However, as I said before, the success of the work will depend upon the training of the teacher. The Normal Schools, in the past, have been very weak in this sort of work, training more for town and city schools than for the rural schools.

In the secondary primary room, with its intermediate grades, part of the agricultural or nature study work can be taken up by the whole room, but most of it should be studied in connection with the geography work. However, I should start the work in the fall in the same way as in the primary room, by having window boxes and asking each pupil to bring a flower to help fill them. In the lower room the teacher did the setting of the flowers, but part of the work in this room should be teaching the transplanting of flowers, so the pupils should do the work, carefully supervised by the teacher to see that the roots are properly placed and that the plant is solid. If the third and fourth grades are together in the room, some of the older fourth graders may prove very helpful in this work. All plants should be correctly named and each pupil should be taught to recognize the different flowers. With this phase of the work in mind, the teacher should try to secure as great a variety of plants as possible from the homes of the neighborhood. The mothers will be glad to give small plants if they have them, and if not, slips. Here is a chance for the teacher to get in some work on slipping, showing the pupils how to cut and trim slips ready for planting. This instruction will have to be objective rather than biological, because the children have had no preparation, though they may be told why the stem is cut in a certain place and why the leaves are trimmed off. In all of this work the principle

should be emphasized that the plants are donated and the boxes are arranged for the good of the whole room. A committee should be chosen each week, whose privilege it should be to care for the flowers, developing the idea of the privilege to serve the room and the responsibility for good service.

The excursions during the good fall weather should be continued in these grades, as there is much to be observed in connection with the geography work and for general information in connection with flowers, trees, birds, insects, and other animals. These walks will serve as a review and will help to fix in the child's mind the name and the image of different animate and inanimate objects. During these walks, either in fall or spring, a collection of wild flowers should be secured and planted in a corner of the school yard. This wild flower garden could be added to from time to time, until it contained all of the wild flowers of the neighborhood. As the children grow older they should know more trees and more birds and their habits. When the birds come, where they build their nests, of what they build them, the number and color of their eggs, and what they eat; so they may know whether they are feathered friends or enemies. All animal life should be observed so as to enlarge upon whatever has been secured in the first primary. The case against the fly should be more fully developed and the friendly helplessness of frogs and toads. In the crusade against the fly, other injurious insects should be brought out. Then the bee should be discussed and his work commended as an insect friend. Within this observation work should fall the different breeds of farm animals. In the earlier work the children have noticed the different kinds of animals, but now they ought to be

taught to observe these animals more closely and, if the school is in a general farming district, to name the different breeds of dairy cows, beef cattle, hogs, horses, and poultry, or as many of them of which the neighborhood furnished examples. This seems to be a legitimate task for these grades as it is no more difficult than the learning of the wild animals from pictures in the geography and is really of greater importance educationally. In many agricultural communities, I have found eighth graders and even high school students who were not sure what kind of an animal a Guernsey, an Angus, a Percheron, or a Duroc-Jersey was. But they could have described a tiger, a llama, or a zebra. If wild animals are learned, it seems to me much more important that the children should know the most productive breeds of farm animals.

SPECIAL THIRD GRADE WORK

The special work in this grade should start from the home as a center, taking up a discussion of the farmstead and what is produced on the home farm in the way of food, clothing, and shelter material. If this has been talked about, a rough sketch of the farmstead should be drawn. Of course at first the teacher will get windows in the houses and a cupola on the barn, but by drawing a diagram of the school yard and the school house as an example this difficulty can be overcome and the first step in map drawing and farm management will be taken. The tendency of the child at this time is to draw pictures, rough likenesses, I should take advantage of this in the drawings, and, with practice, should get good results by putting emphasis on the correct proportions. I do not believe, however, in scale drawing at this stage, as is advocated

by many geographies. After talking about the different things produced in the different homes, I should have the child make a rough sketch of the farm, locating the different fields and naming what they produced during the year.

I should then take up the needs of growing plants, such as soil, air, heat, water, and sunshine. Samples of soil should be brought in from the school yard and discussed and samples of gravel, sand, and clay, or loam, should be shown so that the children may learn to recognize the difference and then they should be asked to bring samples from home. From this beginning, the formation of soil may be developed and the part that it plays in the plant life. The next step would naturally be the teaching of the importance of the air to plants and animals; then air as the source of moisture which is so necessary to plant growth. This would give an opportunity to interest the children in clouds, rain, and snow, and their source, the great ocean. A map of the western hemisphere or a globe might be brought in to show the source of rain. It would be one of the first chances to interest children in objects at a great distance. The importance of sunlight might then be shown by the way in which the leaves of the plants turn to the window or by covering some of the leaves with dark paper. The day time is the growing time, the night the resting and the assimilating. Here again the globes would come into use and the cause of day and night, together with the great distance of the sun might be explained. Something of the causes of the seasons might be discussed, but the teacher would have to be very careful not to give wrong impressions. In the summer when the sun is nearly overhead, is the growing season. In the winter when the sun is far south all plant life sleeps and

many animals, also, such as insects, reptiles, and even the woodchuck and the bear.

After the pupils have found how necessary soil, air, and moisture are for the plants the teacher might take up a discussion of other things used in the home, aside from what is produced there, such as sugar, coffee, Brazil nuts, oranges, clothing, and lumber, and then tell of the homes of the children where these things are produced.*

This would carry the children's imagination far afield and make them compare their home conditions with those of the people that produced each article. The globe and maps might be called in to help locate the different places talked about. This would give a definite interest to this study because it would connect it with the home life of the children.

If these things are produced in countries so far away, how do we get them? In answering this question the teacher should start with the home town and the eggs, etc., which are brought in to be shipped and discuss how the train carries these things to people in the cities. From this, river, lake, and ocean traffic could be taken up. It should be shown how necessary to life on a farm is transportation, both for transporting the farmer's surplus and bringing to him things from all parts of the world. Here is a good place to develop the idea of the interdependence of all people for the necessities and the luxuries of life.

FOURTH GRADE WORK

Much of the agricultural-geography work of the fourth grade would have to be taken up on the same plan suggested for the third

grade, as it must be connected with the child's home surroundings.

* Keystone Company's Educational Stenographs, #2538, 2510, 2753, 3216, 3417, 3178, 4182, 4582, 3823, 3824, 5920, of typical homes and many others showing the costumes of the people may be used to advantage.

In taking up the animals of North America the breeds of farm animals should be emphasized; the climatic conditions should radiate from the home town; the physical features should grow in the imagination from the fields, valleys, and creeks of the township. The sketch of the farm should develop into a map of the township, the home state, North America, and different sections of the United States. The agricultural products of these sections should be discussed and the conditions as to soil, climate, and demand, favoring the production of the particular things produced in these sections. An agriculture product map of the United States at the end of the year would give an excellent review and would help to fix in mind the different localities where the different grains, fruits, vegetables and animals are produced.

During the winter the study of the rabbit, fox, mouse, rat and squirrel¹ should be taken up in connection with the breeds of domestic animals, which should include the dog, the cat, the goat, and other farm animals. As spring approaches emphasis should be placed on the different breeds of chickens and kinds of birds. Good pictures of the birds should be studied, and, as fast as the birds come, they should be identified and a calendar kept of their arrival. This study will work in very nicely with the study of wild flowers and the planting of them in the school garden. On these trips in search of wild flowers, the birds can be identified and their nests observed as to their structure and location.

In the literature of this period there are many poems that bear on nature and on country life, for instance: "The Sun's Travels"^{*}; "The Swallow"[†]; "How the Leaves Come Down"[‡]; "Hiawatha's

*Child's Garden of Verse, Stevenson

†Young & Field, Second Reader

‡Reader-Literature, Third Reader

1. Minnesota Experiment Station Bulletin 54

Chicken's" and "Hiawatha's Brother"¹; "Two Kittens"²; "The Wind"³; "Spring"⁴; "There's a Merry Brown Thrush"⁵; "The Mountain and the Squirrel"⁶; "Robert of Lincoln" and "The Sandpiper"⁷; Rand's "Wonderful World"; A. Cary's "The Calf"; Whittier's "Barefoot Boy"; W. Douglas' "Song of the Bee"; Cooper's "Bob White"; H.C. Anderson's "Pea Blossom"; Holmes' "The Plowman"; Mackay's "Tubal Cain"; Wordsworth's "Daffodils"; Tennyson's "The Brook" and the "Brook Song" by Riley; all these from the Farm Life Fourth Reader, Silver Burdett Company.

If the poem, the "Barefoot Boy" is read in May, when the boys start going barefoot, it will be a review of much of the nature work of the year and give the teacher an opportunity to ask about the habits of many animals and birds, as would also Longfellow's "Hiawatha", "Bob White", and "Robert of Lincoln" tell of two feathered friends in whom the children are interested. The story of "The Sleeping Beauty" dramatizes the succession of the seasons and the coming of the spring. There are many poems and much prose in the different readers that a live rural teacher may use to show the beauty of the country and to enthroned rural life. The tendency of the teacher has been to speak of the things in the abstract, principally because they were vague to her, but if she were thoroly acquainted with all of these things, she could vivify the poems.

In the third and fourth grades in the hand work much may be done to correlate it with agriculture. For instance, in the sand table work, the sand table each month might represent a different

-
1. Reader-Literature, Fourth Reader
 2. Graded Poetry, Third Reader
 3. Story Hour, Third Reader
 4. Young & Field, Fourth Reader
 5. Art-Literature, Third Reader
 6. Reader-Literature, Third Reader

farm scene; September, the Home farmstead; October, a Spanish rural scene; November, a Pilgrim town with the farm land about it; December, Bethlehem and its surroundings; January, a Lap or Sequino scene; February, Mount Vernon or a Lincoln frontier home; March, a Holland rural scene; April, cherry blossoms and a Japanese home; May, a Hawaiian or Philippine home.

Much of the handwork in drawing, cutting, weaving, and moulding, can be centered about the sand table. This would motivate the work and make it more interesting, as the teacher might reward the best workers by using their handwork on the table. Apples, pumpkins, dogs, cats, and other animals may be cut out and colored or moulded; also flat and gabled houses. Raffia, rugs, hats, and baskets, may be woven and clothes made for the sand table people. In connection with the bird calendar the different bird eggs might be sketched and colored according to pictures. Even the birds might be drawn and colored or different breeds of dairy cattle and horses.

FIFTH GRADE AGRICULTURAL AND CORRELATED WORK

The special topic in the fifth grade ought to be plants and their seeds. During the first two months all kinds of weeds should be investigated and specimens brought to school for identification and study. Specimens of annuals, biennials, and perennials ought to be pressed for winter use and enough seeds ought to be collected from each of the more important and most troublesome weeds to fill a small glass bottle. This collection will be of great importance during the year in the study of clover, wheat, and oats, and in determining the identity of the tares in the different samples of grain. As the special study in the first intermediate was animals,

of all kinds and especially the different breeds of farm animals, so in the fifth the special study is to be plants, including all the more important weeds and all kinds of garden vegetables and field crops. Specimens of as many of these as possible should be on hand ready for use as the year goes on. When school opens there should be an opportunity to obtain samples of buckwheat and some unthrashed grains and vegetables of all kinds ought to be available. All weeds and vegetables injured by a light frost should be taken up first and the others as opportunity offers. The work of this grade should deal more with the identification of plants and their seeds rather than the eradication of the troublesome weeds; such discussions should come up later when the children have had something about the care of soils.

During the winter there should be contests in the identification of the unnamed pressed plant specimens and the seeds in the different bottles. Then toward spring samples of the different seeds from home, such as oats, wheat, or clover, should be brought to school and the foreign seeds separated and identified, if possible. Later on, just before planting time, one hundred kernel samples of the different small grains that are to be planted in the neighborhood should be placed in a rag, or blotter tester and kept moist for five or seven days. Then the testers should be opened and the good, well sprouted kernels counted, or vice versa, the dead and weak kernels. This is a very good exercise because it gives a concrete example of percentage and the teacher should not miss the opportunity to impress it upon the minds of the pupils. Little manila envelopes, two by four inches, may be secured and samples of all kinds of seed that are to be planted may be brought to school and tested.

The sample should be of the seed just as it comes through the fan-mill, and not one hundred of the best seeds to be found in the sack.

In connection with the geography work in the small book, there should be many references to the products of the different countries studied in the fifth grade. After the children's study of the different kinds of plants, both grains and weeds, they will be interested to find that both wheat and corn grow in Mexico and are important products of Argentina. In fact, as these countries are studied under the heading of agriculture, many items of interest as to climate, soil, and agricultural products will be found. This will be true as the class advances and takes up the work on Europe, Asia, and Australia. The class will be much more interested in the products of those countries and their climates because of the study of plant life around them. While the class is studying Europe attention should be called to the original home of the Holstein, the Guernsey, the Brown Swiss, the Aberdeen Angus, the Short-horn, the Clydesdale, the Percheron, and of all the other breeds of farm animals and poultry that originated in Europe. This would connect their life on the farm with the European countries and make them seem more real; they would cease to be useless peninsulas, islands, plateaus, and mountain ranges, whose names and locations are hard to remember. A good review of every continent would be the making of an agricultural product map for each. This would help to fix in mind both the climate and the plants of that continent.

All through the grades the nature study and agriculture work will have served as sources for oral and written language. It is

surprising in what good sentences and how connectedly even a little first grader will talk about an animal, a plant, or a house with which he is familiar. This ability develops as he goes through the grades and by the time the fifth grade is reached, he ought to be able to write a connected story about a weed, a grain, or a breed of horses. The time was when technical grammar was taken up in this grade. How much better to leave this for the eighth grade and develop the use of good English by letting the children tell in their own words about familiar things in which they are interested.

In the literature work of this grade and the history work of the sixth, some time should ^{be} given to the study of the lives of Charles Newbold, Jethro Wood, and John Lane in connection with the development of the plow; of Cyrus McCormick, Obed Hussey, and John Appleby in connection with the twine binder. Linked up with these would be the study of the lives of such men as James Watt, Robert Fulton, S.B. Morse, whose inventions made possible the transportation of the grain, which the other inventions helped to produce in larger and larger quantities as the settled area increased. In connection with this biographical work such poems as "The Brook", "The Rain Song", "The Landing of the Pilgrims"^{*} and "The Frost", "Woodman Spare that Tree", and "Planting the Apple Tree"[†] may be used to emphasize climate and nature and home life.

The handwork of this grade would depend on whether the fifth and sixth were together in the same room. If that was the case and the sixth grade boys were to have any woodwork, the fifth grade boys would have to take woodwork or something similar, too, in order to save the schedule. The girls could have sewing at that period.

Eighty minutes each week might be devoted to carpentry and sewing,

* Young & Field, Fifth Reader

† Graded Poems, Fifth Reader

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but that much more time might be used in rope work, weaving and braiding. I am not sure but that I should favor the latter work and leave out the carpentry, though the boys might use their carpentry to make looms and easy problems, the idea being the acquiring of skill in the handling of tools. The rope work is very practical and useful and correlated with Scout lore as well as with farm work. The weaving ought to be of rag rugs, large enough to be of use at home. The boys could help in gathering the husks and the girls could do the braiding and the sewing under the supervision of the teacher. These husk mats or rugs are very useful for kitchen porches. At the beginning of the term the pupils should procure their own slips, cut and set them and make their own window boxes. Some community or room work should always be under way to develop the cooperative spirit.

SIXTH GRADE AGRICULTURAL GEOGRAPHY

The second book of most standard geographies begins with North America, taking up the climate and the soil. A detailed discussion of the climate belongs more properly in the seventh grade, but a history of the causes that produced the different soils should be taken up at this time, such as the decay of the original rock formations to make residual soils and the movement of the materials by the wind, water, and glacier to make transported soils. The pupils should bring in different samples of soil, varying all the way from peat and clay to gravel if such types can be found in the neighborhood. Excursions should be taken to a ravine runway, if no creeks are to be found in the neighborhood, and the soil strata examined. The children should determine if possible in what kind of a soil area they live. A soil bulletin should be

secured from the state experiment station to help in this solution. In the solving of this problem, the pupils will become interested in soils in general and their own soil types in particular; so quite a thorough discussion of the formation and general characteristics of the different types of soils may be taken up.*

As plant and seed identification was the work for the fifth grade, so soil identification, care and adaptability, should be the work of this grade. The pupil should sketch his farm, showing the garden and the different fields and the crops raised thereon during the year; then samples of soil should be brought from each and its type determined by appearance, feel, and magnifying glass (a small twenty-five cent one). There are many simple but interesting experiments that the teacher and the sixth graders could carry out, such as reading the temperature of clay, loam, and sandy soils and of those different soils saturated with water or covered with lime or lamp black or mixed with humus or exposed to the sun in different ways. These samples to be placed in tin buckets or in boxes which might be made by the pupils in manual training. Discussion of the results of the experiments should be encouraged and the teacher should see that correct conclusions are reached according to the data. The interest should be keen enough so that many samples of soil from home gardens and fields will be brought in.

There are many experiments that are not too hard for the sixth graders, but space will permit that I barely enumerate them: for instance, the weighing of the soil samples. The scales from the agricultural laboratory should be borrowed and even quarts or gallons of soil should be weighed, and from these weights, the weight of a cubic foot of the different kinds of soil might be computed. This

* Taylor, F. W., Soil Studies, N. H. School Bulletin, May '08.

will correlate arithmetic with the agricultural work. From the sixth grade on, this correlation should be made as much as possible. Dry, moist, and saturated samples should be weighed and results noted. Take bottomless glass jars or lamp chimneys and fill each with a different kind of soil; pour water on each to note the rapidity of percolation. Or, weigh the chimney and the dry soil and then set in water, noticing the rapidity of the rising of the water. When it is saturated, remove the cover and drain over night and then weigh; find the weight of water absorbed and calculate for a cubic foot. Then simple experiments can be performed to show how clay will puddle and a soil with humus will not, demonstrating that texture and moisture have a great deal to do with the workability of soils; and how a dust mulch will prevent evaporation and save the moisture for the growing crop. This work will prepare the pupils for any home project garden work that they might take up.

As the pupils go on in their geographies (*) in the study of the United States, their attention should be centered on the description of the soils of the different sections and the agricultural products of each so that the relation between the two maybe established. There is an astonishing amount of real agriculture including soils and crops and irrigation given in the large geography. All these, together with the description of the transportation facilities, are of interest to rural children. They should be familiar with the soil and climatic conditions of the different states or sections, competing in the markets of the world with their home state. In this connection local, rail, and water transportation becomes important. Map sketching will help to fix in the pupils'

*Brigham & McFarlane, Essentials of Geography, p.5-30, 55-59, 99-107
 Hart & McMurtry, New Geographies, Second Book, p.7-23, 40, 50-53, 72-73-74
 99-109, 120-1, 137-34

memory the location of places and sections and their products with the routes of transportation*.

The handwork for the sixth grade in most consolidated schools will be taken up with the fifth, as I have indicated. In the reading and language work the rural thought and the rural ideals should be brought out whenever possible, as in "The Death of the Flowers", "A Sugar Camp", "The Baltimore Oriole", "The Planting of an Apple Tree", "Pippa's Song", "The Pied Piper of Hamelin", "Chanticleer and the Fox", and "How Robinson Crusoe Learned to Use his Hands".²

In the sixth grade history work, as in the fifth, I should recommend the study of the lives of more men like Eli Whitney, the inventor, Thomas Jefferson, the founder of our system of land surveying and of our money, Samuel Slater, the builder of machinery, and George Washington, the progressive farmer.

SEVENTH AND EIGHTH GRADE

For most consolidated schools it seems wiser to use the six and six plan of organization because as a rule there are so many overgrown boys in the upper grades that they would feel more at home with the larger pupils than with the smaller, and would, therefore, be more apt to become interested in the work and stay in school. Then, too, the larger boys could take part in athletics and this would help to hold them. From an administrative standpoint, it means economy, because it means a saving of one teacher and besides it means better instruction, due to the departmental work and the better preparation on the part of the teacher, so that the children's time is saved. This is not theory on my part because

* New Geography II, Farr & McMurtry, p.181-192

1. Graded Poetry, Sixth Reader
2. Young and Field, Sixth Reader

I have tried it and it works out well. A regular forty or forty-five minute schedule can be maintained throughout the six grades by alternating by days, by weeks, or by months some of the less important grade subjects or by using part of a period for supervised study.

Another innovation that has been tried in a few communities is that of dividing the school year into two terms or semesters, one beginning November first or fifteenth, and the other March fifteenth or April first. This plan has been tried in Denmark* and works very well, as it gives the older pupils a chance to help at home during the growing and harvesting season and then attend school during the winter when the chief work of the farm is "chores" and a student living at home in a consolidated district can help with these.

SEVENTH GRADE AGRICULTURAL GEOGRAPHY

According to the new geographies,** the causes of the seasons and a discussion of the climate come up in this grade. This is a better arrangement than in the old ones where the discussion came up a year or two earlier, for the pupils are more developed and can grasp the ideas better. A knowledge of the causes of the change of seasons is important to the farmer so that he will know the time of the growing season. Following the discussion of the seasons, comes the discussion of the prevailing winds and ocean currents of the world and the resulting climate caused by these phenomena. In these discussion of climate comes the explanation of the succession of "lows" and "highs" across the country and their influence on the rainfall and weather of the great central plains. As the climate

* U. S. Educational Bulletin 569, E. W. Fought, p. 38, also U. S. Bulletin of Education, 395.

** New Geography II, Tarr & McKim, p. 306-331, Essentials of Geography, Brighen & McFarlin, p. 342-50

a country or place depends upon its nearness to the sea, as well as on its latitude and elevation, it is quite important to understand all these in order to know what the different countries may produce in an agricultural way. Consequently, it is almost as important to know the climatic conditions in other countries as in ones own. By knowing these conditions one can account for the winter wheat belt and the spring wheat area, why corn is not more successful in New England and why a special kind of wheat was needed for Montana and North Dakota. I could multiply these examples indefinitely. They only go to show the influence of climate on agriculture. It is important that the farmer have a general knowledge of the causes and effects.

A weather chart should be kept, showing the direction of the wind, the temperature readings, cloudiness, and precipitation each day. From this calendar and study, forecasts should be attempted. Outline maps of the United States should be filled in to show the average rainfall for the year for both winter and summer precipitation to show the difference made by the seasons. This study will become more interesting if there is a review of the agricultural products of the different sections as learned in the sixth grade, and a correlation is made between the product maps and the rainfall. The need and importance of irrigation and dry farming projects of the west will be emphasized. There is a wealth of agricultural material here that is seldom used, but is studied by the children as dry facts, necessary to be learned, but soon forgotten. Since the class has had the explanation of the constant winds, it can take up the study of the climate of South America by the problem method, and after the climate of the different areas is accounted for, their

agricultural products may be discussed. This same method may be used with regard to Europe. This will bring up a discussion of Durham and Turkey wheats and their adaptability to similar American conditions. It would also bring up the origin of oats, barley, millet, alfalfa, and potatoes. About this time in their American history the children would be taking up the study of the American Indians and this would give the teacher a chance to emphasize which vegetables and what grains were obtained from the Indians. During the study of the European countries the breeds of livestock raised in the different countries should again be emphasized from the Shetland ponies and reindeer of the north to the Leghorn chicken and Merinos of the south. The remaining continents should be taken up in the same way as South America and Europe, placing emphasis on any plant or animal that has been imported and raised in this country, whether Japanese rice, Brahmas, or Pekin ducks. To make the countries studied more real there are whole sets of agricultural views made by the Keystone company, as those on coffee, rubber, rice, cocoa, coconut, tropical trees and plants, irrigation, dairy-
ing, and transportation. These stereopticon pictures with the information printed on the backs will stimulate the child's imagination and add much to his store of knowledge. In addition to these there are many exhibits of great educational value sent out by manufacturing firms,*which can be used in the lower grades as well as in the seventh.

For concrete agricultural work in the seventh grade, a study

* A few of the exhibits obtainable are advertising materials such as: Alfalfa (A.P.C.Denger), Breakfast food (P.O.C.Battle Creek), Chocolate (H.C.C.Hershey), Corn Products (A.M.A.& C., P.H.C. Chicago), Cotton Thread (O.H.T.Clay), Fertilizers (M.& C. Chicago), Flour (P.H.F.O.Minneapolis), Rubber (B.R.S.Co.Boston), Sugar (A.S.R.Co. New York), and Tapioca (M.T.Co.Orange, Mass.).

of corn, including the selecting of seed corn, should be taken up, provided, of course, the school is so situated that such a study would be profitable. This work ought to start about the last week in September, depending upon the latitude. At that time the discussion of what constitutes a good ear and the reasons for early selection should be emphasized. A week of the geography time might be used. Then during the winter, time should be taken for corn judging and instruction in testing, so that the seventh and eighth grades could unite in corn testing work for their parents before planting time.

If the school is situated in a wheat region where corn can not be raised, then the work for this grade should be a study of wheat, the different varieties and their adaptability, the importance and uses of wheat, its cultivation and the judging and testing of samples brought from home. The main agricultural work for this grade would depend upon the locality in which the school was situated, as it should be the study of the principal crop of the neighborhood, the crop in which most of the children would be interested. In any case, much of the arithmetic work of this grade should be correlated with agriculture. The latest edition of Wentworth-Smith's advanced arithmetic lends itself to such adaptation, so that many practical farm problems could be given for solution, such as land areas, crop yields, capacities of cribs and bins, and the market value of the crop.

In conjunction with the eighth grade, the two classes might make the school hot bed. If the frame work has not been made, it will give a good opportunity for carpentry work. The making and planting of the hot bed is the best of agricultural practice for

both the girls and the boys in preparation for their garden projects.

In the literature work there are a number of poems that are quite appropriate for this grade, such as, "The Flower in a Cranied Wall", "To a Humble Bee", "Snow Bound", "A Day in June", "Winter", "The Buffalo" and "A Voyage on a Florida River". The oral and written language work ought to center about corn or wheat and the subjects discussed in geography for two reasons; first, the pupils would have something ready at hand, and second, it would help to fix the most important things in their minds.

In the hand work the boys and girls would be separated, and in most consolidated schools each group from the seventh grade would work with a similar group from the eighth grade. The boys would have carpentry and the girls sewing and cooking. In both cases the problems should be practical, dealing with home needs. The boys in their wood work should make articles for which there is a real need at home. Of course this would mean that many things might be under construction at the same time, which would add to the instructor's problem; but the pupils would be so much more interested that the problem would tend to solve itself.

EIGHTH GRADE AGRICULTURE

If the large general geography is finished in the seventh grade, a special study of the physical conditions and the agricultural products of the home state should be made in the eighth. The former should include a soil map of the state, together with the topography and the drainage. Outline maps filled in to show annual precipitation and summer and winter isotherms would be helpful. The general agriculture work of the grade should be taken up in discussing

* From: Young and Field's Advanced Reader

the agricultural products of the state, and should include a study of the small grains produced, the livestock raised, and the vegetables and fruits cultivated in the home garden. While the cultivation of the crops, the housing and management of the livestock, and the care of the garden should be considered, the work should be general rather than too much in detail as there is a great deal to cover, especially if a book is used as a text.* Of course this may be done, but more lasting results would be obtained from discussing the care and cultivation of the things that are raised at home, using the book as a reference. In the same way the farm animals should be discussed and the principal characteristics of the different types brought out.

As a field crop was a special subject for study in the seventh grade, so the dairy cow might be for the eighth; in which case the class should become familiar with the different breeds and the good points of each as well as the general characteristics of a good dairy cow. The housing, feeding and care of both the cow and her milk should be discussed. Home project work should be encouraged in the form of a cow-testing club. Such work should show the importance of good stock and good care and proper feed. The discussion of the sanitary care of milk would give the teacher an opportunity to discuss sanitary conditions about the home. The latest studies made by the Rockefeller Foundation in comparing rural sanitary conditions with urban conditions give results all in favor of the latter, showing disease more prevalent among the rural children, so there is a great need for teaching farm-home sanitation. If fresh air and a clean stable are good for cows at all times, then a clean

*Elements of Farm Practice, Wilson and Wilson, Webb
Productive Farming, Davis, Lippincott

house and good fresh air, even in the sleeping room, are good for people. In this connection the teacher could take up the subject of proper food and the variety necessary to supply the different wants of the body and, consequently, the advantages of having a vegetable garden and plenty of vegetables and fruit to keep the body in good working order.

Much of the agricultural work of both the seventh and eighth grades might be taken up through the individual project, or the Indiana plan* of the whole class working on the same project might be adopted. In either case, the pupils should become interested in a particular phase of agriculture and would be anxious to read all books and bulletins on that particular subject. For instance, the community in which the school is located might have no dairy cattle, but would be apt to have chickens, so a poultry problem, such as raising a brood of chickens, might be taken as the class problem or some other poultry problem, and then the pupils would look up all available material on poultry.¹ Or a home garden project might be selected and a study made of vegetable gardening.² This would make an exceptionally good practical problem and would be a project that all could work out. The variety of the projects adopted would have to depend on the number in the class and the time at the disposal of the instructor. These home projects, as they progress, should be inspected by the instructor, so that helpful criticism might be given and the child encouraged. Under such a system it becomes real school work, instead of old club work, where the child went ahead with little or no help.

*Indiana Education Bulletin # 27, Smith

1. Indiana Education Bulletin #27, p.148-151

2. Indiana Educational Bulletin #27, p.188-210

If the dairy project is used by the class, the milk samples brought in by the cow-testers should be tested by the students themselves. They should soon learn to make the readings and figure the percentage of cream. Arithmetic problems should be made out of these tests relating to the monthly cream checks and the amount of milk produced.¹ In fact, most of the arithmetic work of this grade should be in the nature of practical farm problems, such as the capacity of silos and the amount of material required to build a certain silo and the cost of it. The same problem might be used for a corn crib, a garage, or even a barn or a house. A good problem would be to have a boy work on the cost of a building or improvement that his father was going to make at home. So much of our arithmetic work and so many of our books are written for urban schools with little of practical value to farm children. This is so true that in attempting to make the arithmetic more practical in a consolidated school, by taking up farm problems, my eighth grade pupils resented the attempt because they thought it was not real arithmetic. They were so accustomed to book arithmetic which had no connection with home affairs that they thought I was imposing on them, and it took some time to get them interested in real arithmetic. Some of the more recent editions of the standard arithmetics attempt to meet this objection and base their problems upon everyday business, so that a rural teacher can apply them to farming operations and farm life.² The need is for more problems dealing with farm crops, livestock, concrete, farm machinery, and home supplies.

1. Essentials of Arithmetic, Advanced, Wentworth-Smith, p. 132-133, 138

2. Essentials of Arithmetic, Wentworth-Smith, p. 43-58, 110-5, 227-34, 266-67.

Farm Accounts, Laurel Book Company. All farm problems.

In history and literature there is much available material. An Industrial History of the United States such as Sanford's "Story of Agriculture in the United States", might be used as a supplementary reader or might be taken up later in high school as a regular study. Two long poems usually read in this grade, "Evangeline" and "Snow Bound" are both found in the Elson Grammar Reader IV. They both give many rural pictures of the past. Other poems with a rural setting found in the same volume are "The Brook", "To a Waterfowl", "The Skylark", and "To a Skylark" and the poem "How They Brought the Good News From Ghent to Aix". The latter describes in detail a horse in action.

HIGH SCHOOL AGRICULTURE

The curriculum for the high school is not so difficult to outline as the agricultural work for the grades. In the first place, the course in a consolidated school should, if possible, cover four years, as it is in the nature of vocational work. The more the rural student gets of this subject the more interested he will be in his farming when he comes to apply his knowledge to his farm work. By starting the new term about the middle of November, many of the other boys could enter regularly and if need be take eight years to finish; or they might be allowed credit for home projects, worked out, as in the Smith-Hughes schools. If they are going to stay on the farm a longer period it would be advantageous. They could attend in winter just as long as subjects were given in which they were interested.

FIRST YEAR

In the first year, Field Crops should be given. The pupils will come to a study of this subject with some knowledge of the

different crops, because of their work in the grades. All students both boys and girls, should take this course as it would deal with subjects with which all rural people ought to be familiar, such as corn, cultivation, wheat, oats, barley and rye, raising, the care of forage crops and rotations. The subject corn should include the selection of seed, storing of the seed, judging seed corn, testing the seed, and planting and cultivation. As part of the laboratory work of this class the pupils should do seed corn testing not only for their own families but for all the neighborhood. It is entirely feasible to have the farmers or the older children take the kernels from the ear to be tested and put them into a numbered envelope and send them to be tested. This is one of the ways in which the school can serve the public and it gives another opportunity to teach social service. Considerable time should be spent upon varieties of wheat and the other small grains as well as on the forage crops and some time on rotations, though this subject will come up again in Soils.

The school plot or school farm should be carried on in connection with this course, as it ought to produce laboratory material such as varieties of wheat, oats, and barley. As laboratory work the class might help to plant the garden, which should produce vegetables for the Domestic Science department to use for noon lunches and roots to be stored for the same purpose. Within the enclosure or beside the garden should be located the hot bed, which should supply the needed tomato and cabbage plants for the neighborhood. Part of the plot might be used to carry on some crop and soil experiments, which the agricultural teacher deemed necessary to his work or that might benefit the community. Another part might be devoted to a nursery,

so that the horticulture class might have material on which to work and for landscape gardening.

MANUAL TRAINING

The shop work of the first year should be made as practical as possible, consisting of drawing, forge, and blacksmithing, and soldering and work in leather and concrete. If the students have come up through the grades, they have had two years of wood-work, so it would add interest to change to a different kind of manual work. Then a knowledge of these processes is of practical value to the farmer, as he can do much of his own repairing if he knows how and in that way save time and money.

The farm arithmetic and bookkeeping of the first semester should be a short, thorough review of Farm Arithmetic and should include the fundamentals of bookkeeping, so that the young farmer could keep a simple set of books and make balances.

The opportunity given for an elective in the second semester of the first year would have to be a class elective, determined by a majority vote because in a small school there would be neither teachers nor pupils enough to operate two classes in a large high school. Either course would give fundamentals of value in later study, the biology adding interest to the Field Crops and especially to Animal Husbandry, while the general science would help in understanding climatic conditions and soil formation and would explain many natural phenomena which are mysterious to children.

SECOND YEAR

The main study of this year should be Animal Husbandry, taking up the different types and breeds of farm animals. One semester should be devoted to cattle, beef and dairy; this should include

score card work and placing and the feed and care of the different types, more emphasis being placed on the types most common in the neighborhood. In the second semester the types and breeds of horses, hogs, sheep, and poultry, should be studied. As many representative individual animals and herds as the neighborhood affords should be viewed and scored to give the students as concrete a conception as possible of the different breeds. If no good specimens are available then a collection of pictures is important. The Breeders' Gazette and the Stockman should be regular callers at every consolidated school and should be kept for ready reference.

The handwork of this grade should consist of drawing and carpentry. The boys should learn to make and read working drawings, so that they can make an article from a set of drawings. In addition to this and in connection with it, they should be making practical articles for the home and the farm, such as gates and coops or an individual hog house and before the year is over they ought to help in the construction of a larger building such as a big chicken coop or hog house or barn. They should get real practical experience so that they would know how to go about the construction of a building on their own initiative.

Some place in the high school course the student should have a drill in letter writing and business forms. Anyone familiar with farmers' letters would agree that this would meet a real need. Accordingly, this second year's English should be arranged to meet this need. The course should include practice in writing different kinds of letters and drawing up all kinds of business papers. Such a practical course in English would prove of immense value to the students.

THIRD YEAR

In the third year the main agricultural subjects are Horticulture and Dairy Husbandry, though this choice would depend upon the kind of farming done in the community. In most communities Horticulture would be a good subject to take up as it could be made concrete and offers good opportunities for projects. All students, both boys and girls, should know about vegetable gardening and fruit raising and most of them would have gardens and fruit at home. Horticulture should also include Landscape Gardening and the beautifying of the farmstead. Many a farm home could be improved by the application of the fundamental principles of Landscape Gardening. Horticulture is very important because it deals with so many things that touch the home intimately.

If the community has a creamery in it and is interested in selling milk or cream, then it will pay to devote a half year to the study of the dairy cow. The dairy cow is a nervous, delicate animal and should have special care, if best results are to be secured; so time spent in the study of housing, feeding, and caring for her will tend to increase the cream check. This course should include barn plans, silos, balanced rations, the sanitary care of the cows, the milk, the cream and the separator. It should also include cow-testing to find out the economic value of each cow. If home projects are carried on with this course, it would prove intensely interesting.

If the community is not interested in dairying, Business Law might be selected by the class as it is a subject of which every intelligent farmer should know something. If he knows the principles of a contract, what a sale is, the responsibility of an agent, the disadvantages of a partnership, and the powers of a corporation, it

will help him in his daily life and save him many a dollar; consequently the knowledge of Business Law is more important to a farmer than to most city dwellers.

Another business study that should interest both boys and girls is typewriting. This should be a very practical study for the boys, because, if they learned how to operate the typewriter, their letters would be presentable no matter how stiff their hands were from farm work. In the case of the girls they might take stenography with the typewriting, so that they could take dictation from their fathers, or, later, from their husbands, and then write the required letters, while the men were out in the field working. Consequently, such a course would appeal to the young people of a consolidated district.

While a term's work in Industrial History would not make the same practical appeal to the young folks, it is a subject which should be studied for its broadening effect and the proper placing of farming among the leading world industries. It teaches also an appreciation of agricultural development and the leading place that the modern farm takes in American life.

FOURTH YEAR

In the fourth year Farm Management should be given during one semester and Soils during the other. It would be better to take up Soils in the fall as then work could be done in the field before the ground freezes and samples could be secured for the winter work. To get the most out of this course, Chemistry should be taken up during the junior year, because it is almost a necessity to have a knowledge of the elements and their reactions. A farmer, however, should have a fair knowledge of Chemistry, because it helps

in the understanding of plant life, manures, and fertilizers, as well as in an understanding of soil maintenance. The study of the formation of soils and of the agents still at work in their production is important; but still more important is the knowledge of how to care for the soil by means of proper cropping and a well-thought-out system of rotations. If the young farmer studies such systems and learns of soil analysis and the use of fertilizers, he is ready to take up a scientific study of Farm Management in order to see what kind of farming pays in the long run. When he learns to figure out the cost of the farm plant and of farm crop production, he begins to see that there is more to the business of farming than he thought. Each semester's work lends itself to a practical application as the soils of the neighborhood farms may be examined during the fall and their needs roughly determined while for the latter part of the year the student might use his own home farm for his practical problem and figure gain or loss from it.

The semester's work in Agricultural Engineering should provide a short course in surveying, including the use of instruments, so that drainage systems could be properly constructed. It should also include a study of good roads, their construction and maintenance, of farm buildings and of farm sanitation. The second term's work in the senior year in Farm Machinery and Farm Motors should take up a thorough study of the different farm machines and their adjustments. The class should visit various farms in order to study the different machines. In this course should be taken up the study of the gas engine and the different machines of which it is a part. This course proves especially interesting to boys.

The study of Rural Sociology should be made as simple and concrete as possible and should deal with the farmer and his connection with his neighbors, emphasizing cooperation and community dependence. Then the home and its surroundings should be discussed as to comfort and sanitation. The school, the church, and the local conditions as to roads and other means of communication should all be considered. If right ideals can be set up, the community will be well on the road toward prosperity and happiness. This is a subject that all rural pupils should take in order to increase their social efficiency. It would be an elective worthy of careful consideration by the class.

In arranging this curriculum for a rural high school the principal thought has been to prepare the student for a life in the country as a farmer. If there is occasionally an exceptional boy who wishes to take college work in order to prepare himself for other work, it would take less than a year's work on his part to make up the necessary credits. He would be apt to lack only mathematics and language. This does not seem a great injustice when one considers that a large majority of the students will never go to college.

All consolidated schools can not give a four year high school curriculum, due to small enrollment or to the number of teachers. Nevertheless, such a school would be situated right in the heart of a rural section, whether they were in the open country or in a small village; therefore, they ought to give at least two years of work, which would fit their boys to be productive citizens of the community. With this need in mind the following two year high school course has been arranged.

TWO YEAR COURSE

I. First Year

1. Field Crops, including a discussion of Soils
2. Hand Work- Forge, Leather, Concrete
3. Farm Arithmetic and Farm Bookkeeping
4. English, emphasizing Language Work

II. Second Year

1. Animal Husbandry- Types, Breeds, Care and Feeding. Local Needs
 2. Hand Work- Working Drawings, Carpentry, with practical problems
 3. Business Law and Rural Sociology
 4. Business English- Business Forms and Letters
- Physical training should be given at least twice a week.

The content of the above course is very similar to that of the four year curriculum, but several of the courses, such as Field Crops and Animal Husbandry, would have to be more general and cover more ground. For example, Field Crops would have to include work in Soils, manures, and rotations. Most of the practical or vocational courses are retained and I am sure that the course would appeal to the young farmer.

ADULT COURSES

It would seem just as necessary for a rural community to give courses for adults as for a city; nevertheless most cities provide courses for adults, while very few rural communities do, as shown by the replies to my inquiries. As a rule, the only work that has been done along this line is through extension departments of

agricultural colleges, arranging farmers' institutes and short courses. These, as a rule, are given only in the larger places in each county, so they are really not community courses, but they have helped the farmers nevertheless.

In every rural community school one or two courses ought to be arranged for each winter. If possible a course for the wives should be arranged so as to be given at the same time as that for the husbands, then both could drive in together. This would make it a more important event in the community and assure a better attendance. If the course is to be of real value, it ought to consist of a lesson a week and extend through the winter months. With a "movie machine" or lantern installed in many schools and with all the material available from the national and state extension departments and from the International Harvester Company, it should be comparatively easy for the principal to arrange a valuable course along any of the following lines.

1. Rural Sociology- Cooperation, Sanitation, Home and
Barn Improvement
2. Animal Husbandry- Types, Care, Diseases
3. Field Crops- Cultivation, Rotations, Seed Selection,
Diseases
4. Business Forms- Bookkeeping and Banking
5. Horticulture- Vegetables and fruits

If the foregoing curriculum could be given in a rural consolidated school as outlined, there is no doubt but that the boys would finish it, well equipped for their work on the farm. Undoubtedly, rural life would seem broader and farm problems more

worth the solving. Life in the country would not be just drudgery as in past years, but would have a new significance with all nature about them speaking to them in many new tongues. Such boys would make efficient, open minded farmers, well prepared to solve their problems in Soils, Breeding, and Farm Management.

Such is our ideal, but it is much easier to arrange a curriculum than to have it presented in the right way. This is especially true of an agricultural curriculum, because it is hard to find properly trained teachers. If agricultural instruction in our rural schools has been a failure, as some claim, it is largely due to the poorly prepared teachers that have been available.

It is only within the last ten years that the agricultural colleges have tried to provide for the training of agricultural teachers. Of the 888 teachers instructing in special courses in high schools in 1911-12, only 126 had had as preparation one or more years of agriculture in college, and 269 laid claim to no special agricultural training at all. If this was the amount of preparation of teachers in schools offering special courses in agriculture, how about the teachers that are giving instruction in the rest of the 3 200 high schools that were offering courses in agriculture?*

The poor preparation of the teachers may account for the wide spread doubt as to the efficiency of agricultural teaching in high and consolidated schools. There is no question but that many mistakes have been made by incompetent teachers; nevertheless, the fault has not all been with the young teacher and the inexperienced teacher, but somewhat with the public and the critics. The rural

* U.S. Educational Bulletin #513, H.C. Foght, p.17-28

public has looked askance at book agriculture and these ideas however scientific. In a rural community inherently conservative, where the three R's have been so long established and enthroned, it is very difficult to introduce a new subject of any kind.

Imagine a rural community where a few progressives, the board and the state law require the teaching of agriculture, but most of the farmers do not want their children to waste their time studying it, because they know all about farming; they have had it at home all of their lives. Put into such a community a poorly trained and poorly supervised teacher or an unsympathetic old one and it is no wonder that agricultural teaching has acquired a bad reputation.

This reputation is not altogether due to the work of the high school teachers but to the one room country school teachers as well. Several states * have enacted laws requiring the teaching of agriculture in such schools; consequently we find a large majority of rural teachers in these states trying to teach it as another book subject in an already crowded curriculum and an overburdened program. If poor teaching is done by high school teachers of agriculture, what may be expected of women, majority of whom have had but two years of high school work as preparation for their calling, and no agricultural training whatever? This attempt to teach agriculture as a book study by inadequately prepared teachers has caused the farmers of many communities to look upon it as a farce. Yet, in spite of this feeling among the farmers, we know that agriculture should be taught in all rural schools and can be taught to advantage, whether in grades or in high school because

*Bibliography lists courses arranged according to law in Iowa, Indiana, Kansas, Michigan, Minnesota, Nebraska, North Dakota, South Dakota and Wisconsin.

it has been done in Minnesota, Indiana, Iowa, and New York. *

It is true that in many of the cities that forty per cent of the children left school at the end of the fifth grade and it has been estimated that fifty per cent of rural children never go further than the fifth grade.¹ Of course we hope that new and more vital schools will keep the boys in school longer and we hope that the new idea of individual efficiency that is sweeping over the country will be felt in farming communities as well as in town and city and will lead to new educational ideas that will keep the rural boy and girl in school much longer.

* American City, Vol.XVI, p.34

1. Rural Life and Education, E.P. Gubberley, Chap.VI.

APPENDIX

I. FIELD CROPS

A. Grains

1. Corn (Seasonal Outline for School Use)

- a. History and Relations
- b. Selection of Seed Corn
- c. Judging of Seed Corn.
- d. Storing of Seed Corn
- e. Testing of Seed Corn
- f. Preparing of Seed Bed, Soil Needs
- g. Planting - Perfect Stand
- h. Cultivation
- i. Harvesting - Silage, Fodder, Ear
- j. Place in Rotation
- k. Diseases - Injurious Insects

2. Wheat

- a. History and Relations - Classes
- b. Seed Bed, Soil Needs
- c. Place in Rotation
- d. Planting - Time, Kind, Thickness
- e. Harvesting - Stacking, Threshing
- f. Varieties - Judging
- g. Diseases and Injurious Insects

3. Oats - Outline Similar to Wheat Outline

4. Barley - " " " " " Less Time

5. Rye - " " " " " " "

6. Flax - " " " " " " "

7. Other Grains - Buckwheat, Sorghum, Millet

B. Forage Crops

1. Grasses

a. Perennials

1. Timothy

- a. Seed Bed- Seeding
- b. Nurse Crop- Rotation
- c. Butting, Curing, Storing
- d. Seed- Cleaning - Testing

2. Blue Grass

3. Red Top

4. Orchard Grass

5. Brome Grass

- b. Annuals
 - 1. Sorghums
 - 2. Millets
 - 3. Small Grains

II. Legumes

1. Perennials

- a. Alfalfa
 - 1. History- Importance- Bacteria
 - 2. Seed Bed- Inoculation
 - 3. Cutting and Curing
 - 4. Care of Meadow - Rotation
 - 5. Varieties
- b. Alsike Clover- Permanent Meadow
- c. White Clover- Pasture
- d. Sweet Clover
- e. Crimson Clover
- f. Lespedeza or Japan Clover

2. Biennials

- a. Red Clover
 - 1. History and Importance- Rotation
 - 2. Seed Bed- Soil
 - 3. Seeding- Nurse Crop
 - 4. Cutting, Curing, Storing

3. Annuals

- a. Field Peas
- b. Soy Beans
- c. Navy Beans
- d. Vetch
- e. Peanuts

C. Root Crops

- 1. Potatoes
 - a. History and Importance
 - b. Preparation of Soils - Fertilizers
 - c. Planting and Cultivation
 - d. Insects and Diseases
 - e. Harvesting and Storing
 - f. Varieties - Judging
- 2. Beets
 - a. Sugar
 - b. Mangels

D. Weeds

- 1. Annuals
- 2. Biennials
- 3. Perennials
- 4. Seeds

E. School Plat

- 1. School Supplies
 - a. Laboratory Materials
 - b. Canned Goods - Lunches
 - c. Roots- Winter "
- 2. Hot Bed
 - a. Plants for School Garden
 - b. Plants for Community
- 3. Experiments
 - a. Crop- Alfalfa
 - b. Soil- Fertilizer
- 4. Nursery

ANIMAL HUSBANDRY

A? Breeds of Livestock

I. Cattle

- 1. Meat - Characteristics
 - a. Shorthorn
 - 1. History
 - 2. Description
 - 3. Judging - Score Card Work
 - b. Hereford - (Outline Above)
 - c. Aberdeen Angus " "
 - d. Galloway " "
- 2. Dairy - Characteristics
 - a. Jersey (Outline Same as Shorthorn)
 - b. Guernsey " " " "
 - c. Holstein " " " "
 - d. Ayrshire " " " "

II. Horses

- 1. Draft - Characteristics
 - a. Percheron (Outline as Above)
 - b. Belgian " " "
 - c. Clydesdale " " "
 - d. Shire " " "
- 2. Driving - Characteristics
 - a. Thoroughbred (English)
 - b. American Trotters and Pacers
 - c. Coach, English, French, German

III. Hogs

- 1. Lard
 - a. Berkshire
 - b. Poland, China
 - c. Duroc Jersey
 - d. Chester White

IV. Pigs

- 2. Bacon
 - a. Large Yorkshire
 - b. Hampshire
 - c. Tamworth

IV. Sheep

- 1. Mutton
 - a. Southdown
 - b. Shropshire
 - c. Oxford
 - d. Hampshire
 - e. Dorset
 - f. Cheviot
- 2. Wool
 - a. Merino
 - b. Angora
- 3. General Purpose
 - a. Leichesters
 - b. Cotswold
 - c. Lincoln

V. Poultry

- 1. Chickens
 - a. Meat
 - 1. Brahma
 - 2. Cochin
 - 3. Langshan
 - b. Eggs
 - 1. Leghorn
 - 2. Minorca
 - c. General Purposes
 - 1. Plymouth Rock
 - 2. Rhode Island Red
 - 3. Wyandotte
 - 4. Orpington
 - d. Game
- 2. Ducks - Pekin, Rouen, Indian, Runner
- 3. Geese - Toulouse, Embden
- 4. Turkeys - Bronze, Narragansett, Holland

B. Breeding

- I. Inheritance
- II. Selection
- III. Pedigrees - Importance
- IV. General Principles

C. Feeding and Care

I. Foods

II. Balanced Rations

1. Dairy Cows
2. Beef Cows
3. Horses
4. Swine
5. Sheep
6. Poultry

III. Shelter

1. Barn
2. Hog House
3. Coop
4. Silo

IV. Testing - Records

1. Cows
2. Hens

HORTICULTURE

A. Garden

I. Vegetable

1. Location - Convenient, Slope
2. Soil- Rich, Light, Plenty of Humus
3. Plan:
 - a. Perennials
 1. Asparagus
 2. Rhubarb
 3. Horse Radish
 - b. Annuaals
 1. Early
 - a. Radishes, Lettuce, Beets,
Companion cropping, Spacing
 2. Late
 - a. Parsnip, Tomatoes, Beans, Sweet
Corn -
Successive Cropping, Spacing
4. Cultivation
 - a. Seed Bed- Well Prepared, Early Hot Bed
 - b. Cultivation- Dust Mulch, Weeds, Harvesting
5. Diseases and Insects - spraying, Potatoes

II. Fruit

1. Location, Soil and Protection, Convenient

2. Varieties

- a. Strawberries
- b. Raspberries
- c. Blackberries
- d. Grapes

3. Care - Cultivation, Spraying, Pruning, Propagation

B. Orchard

I. Apple

- 1. Location, Soil, Slope, Convenient
- 2. Preparation of Soil
- 3. Planting - Time and Method
- 4. Varieties- Adapted to Climate, Summer, Fall, Winter
- 5. Care- Cultivation, Pruning, Spraying, Budding, etc.
- 6. Gathering the Crop- Hand Picking

II. Plum (Outline as Above) Fillers

III. Cherry " " " "

IV. Peach (Not important in this section)

V. Propagation

- 1. Budding - Method, Time
- 2. Grafting - Method, Time, Importance
- 3. Seedlings

C. Ornamental

I. Flowers

- 1. Annuals- Bedding, Borders
- 2. Perennials - Borders

II. Shrubs

- 1. Flowering - Showy Borders
- 2. Foliage- Hedges, Groups, Backgrounds

III. Landscape Gardening and the Farmstead

DAIRYING

I. Dairy Type

1. Conformation
2. Mammary Development
3. Other characteristics
4. Judging as to Dairy Type

II. Breeds

1. Guernsey - Characteristics
2. Jersey
3. Holstein
4. Ayrshire
5. Red Polled
6. Judging as to Breed Type

III. Housing - Barn

1. Plan - Convenience
2. Light - Plenty
3. Ventilation - Good
4. Construction - Durability & Warmth

IV. Feeding

1. Summer
 - a. Pasture- Protein Content
 - b. Concentrates- Depend on Pasture
2. Winter
 - a. Hay - Clover or Alfalfa -Protein
 - b. Silage -Corn Fodder
 - c. Concentrates- Balanced Ration
 - d. Preference of Individual Cow
3. Cow Testing
 - a. Importance as to Ration
 - b. Economic Importance
 - c. Good Laboratory Work

V. Silo

1. Location
2. Construction- size, material
3. Filling- Crop and Method
4. Feeding Silage

VI. Sanitation

1. Barn
 - a. Light
 - b. Ventilation
 - c. Cleanliness - Floor and Cows
2. Milk- Covered Pails, Cheese Cloth, Hand
3. Separator -Care and Room
4. Care of Milk and Cream
5. Butter Making

VII. Food Value of Milk

1. Man
2. Farm Animals

SOILS

I. Soil

1. Origin

- a. Residual, Alluvial, Aeolian, Lacustrine, Glacial
- b. 1. Organic, Humus, Peat, Etc.
2. Inorganic, Rock Particles

2. Chemical Elements

- a. Essential
- b. Limiting- Nitrogen, Phosphorous, Potassium,
1. Nitrogen- Sources, Bacteria, Need
2. Phosphorous- Sources, Uses
3. Potassium- Sources, Uses
- c. Soil Analysis

II. Manures and Fertilizers

1. Barn Yard Manure- Humus

- a. Chemical elements - Different Animals
- b. Care, Protection - Barn to Field

2. Commercial Fertilizers

- a. Nitrogen- Kinds, Sources, Uses
- b. Phosphorous- Kinds, Sources, Uses
- c. Potassium, - Kinds, Sources, Uses

III. Mechanical Condition of Soil

1. Texture
2. Water Holding Capacity - Drainage
3. Ventilation- Temperature
4. Tillage- Weeds- Moisture
5. Humus- Function, Green Manure

IV. Management

1. Sandy Soils
2. Clay Soils
3. Marsh or Peat Soils
4. Dry Farming

V. Surveys 1. State

2. United States

FARM MANAGEMENT

I. Farm

1. Land
 - a. Own
 - b. Lease
2. Adaptability
 - a. General Farming
 - b. Special Farming
3. Equipment
 - a. Buildings
 - b. Machinery
 - c. Livestock

II. Operation of Farm

1. Farmstead- Location - Arrangement
2. Plan of Farm
3. Crops and Crop Rotation
4. Livestock on the Farm
5. Labor on the Farm

III. Bookkeeping of the Farm

1. Expenses
 - a. Cost of Production
 1. Rent and Interest
 2. Labor
 3. Maintenance and Improvements
 4. Feed and Fuel
 - b. Household Expenses
2. Returns
 - a. Crops (Surplus)
 - b. Livestock
 - c. Family Supplies
3. Profit or Loss - Depends on
 - a. Transportation
 1. Roads
 2. Market
 - b. Demand
 1. Special produce
 2. Presentability
 - c. Cooperation

FARM ENGINEERING

(Applied Physics)

I. Surveying

1. Explanation and use of Instruments
2. Field Work
3. Map making and Computations

II. Drainage

1. Importance of Drainage
2. Planning Drainage System
3. Surveying for Drainage System
4. Tile Drainage - Capacity and Cost

III. Roads

1. Construction of Roads
2. Materials
 - a. Dirt
 - b. Sand and Gravel
 - c. Macadam
 - d. Concrete
3. Maintenance
4. Culverts and Bridges

IV. Farm Buildings- Construction

1. Chicken Houses
2. Hog Houses
3. Horse Barns
4. Dairy Barns and Silos
5. General Barn
6. Farm House

IV. Farm Sanitation

1. Water System
 - a. Pump and Well
 - b. Reservoir - High or Pressure Tank
 - c. House Piping - Kitchen, Bath Room

2. Sewage System
 - a. Drain
 - b. Septic Tank
3. Heating Farm Home
 - a. Hot air Furnace
 - b. Hotwater or Steam
4. Lighting
 - a. Electric
 - b. Acetylene
 - c. Gasoline

FARM MACHINERY AND GAS ENGINES

I. Importance of Machinery to Farming

1. History
2. Economic - Labor
3. Size of Farm

II. Machines for Cultivation and Planting

1. Plow
 - a. Walking
 - b. Sulky
 - c. Gang
 - d. Disk
2. Pulverizers and Smoothers
 - a. Drags
 - b. Disks
 - c. Rollers
3. Seeders
 - a. Broad casters
 - b. Drills
 - c. Corn Planters
4. Cultivators
 - a. One Horse One Row - Walking
 - b. Two Horse One Row - Riding
 - c. Two Row

III. Harvesting Machines

1. Mower
2. HayRakes and Tedders
3. Hay Loader

4. Grain Binder
5. Corn Cutter
6. Silage Cutter and Shredder
7. Thresher

IV. Miscellaneous Machines

1. Manure Spreader
2. Fanning Mill and Separator
3. Elevator or Conveyor
4. Milk Separator
5. Feed Mills

V. Gas Engines

1. Principle of Gas Engines
2. Types of Gas Engines
3. Applications
 - a. One or Two Cylinder - Stationary
 - b. Automobile
 - c. Tractor

VI. Care of Farm Machinery

1. Housing
2. Repair

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