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THE READJUSTMENT OF A RURAL HIGH SCHOOL TO THE NEEDS OF THE COMMUNITY

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ILLUSTRATIONS.

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THE READJUSTMENT OF A RURAL HIGH SCHOOL TO THE NEEDS OF THE COMMUNITY.

INTRODUCTION.

Colebrook Academy is located in the town of Colebrook, in a fertile and prosperous section of the Connecticut Valley, in the extreme northern part of the State of New Hampshire. The town has a population of about 2,000, and the section of the State is noted as one of the best agricultural districts in northern New England. At the beginning of its existence in 1832 the school received a grant of land from the State. For a time it was conducted as a private institution, but it had no endowment, and soon became a tax-supported school. Colebrook Academy retains its original name, but it is a public high school and is entirely supported by taxation. The school district in which it is located comprises only a portion of the town and has a population of about 1,200.

From the time of its first approval as an accredited high school by the department of public instruction of New Hampshire, until 1910, the school had maintained the traditional college preparatory and English curricula. Up to that time it had been conducted in the original building in which it had begun its existence. In 1910 it was decided to reorganize the school on a new basis, with a view to providing a more efficient education for the country boys and girls in the section adjoining the school. Accordingly, a new building was constructed and a new program of studies laid out along modern lines, consisting of the following courses of study: (1) College preparatory; (2) commercial; (3) agricultural; and (4) domestic arts.

AIM OF THE SCHOOL.

In the work which Colebrook Academy is doing, three distinct aims stand out prominently.

1. A program of studies is offered which is adequate to meet the demand for universal high-school education in the section in which the school is located. Education in this country has become practically universal in the sense that nearly everybody receives some education. But it is far from universal in the sense of provision for the needs of all classes of people, or of adaptation to the aptitudes and inclinations

of all, or of outgrowth from the peculiar industrial requirements of different localities.

In the past, both high-school and collegiate education have favored those whom we may designate as the professional class, at the expense of those engaged in industrial pursuits. The situation has been vastly improved since 1862 in respect to education of collegiate grade in industrial pursuits, on account of the establishment in every State of higher institutions to teach agricultural and mechanical as well as other industrial studies. But these colleges are able to reach only a very small proportion of the people, because the people as a whole do not go to college. The great problem before the present generation is to extend industrial education of the right kind to the secondary schools in order that the influences which are expected to be derived from such education may be felt by the masses. The rural high school, situated in a small community, with meager financial support and with a faculty limited to five or six members, finds itself facing a most difficult situation when it attempts to solve this problem. It can not be solved by offering to every boy and girl in the rural communities the studies of the traditional classics-mathematics-science type of high school. On the other hand these studies should not be omitted from the program. Some boys and girls in the country in the very nature of things should be educated toward professional life. One of the great aims of secondary education in any locality should be to provide a program of studies which shall take into consideration the natural aptitudes, inclinations, needs, and destiny of the boys and girls of the section. In addition a type of education must be established which shall react upon the community and the region in which the school is located in such a way as to be a source of strength and a means of upbuilding the whole district tributary to it. If education is to be universal, not only must the needs of the boys and girls be taken into consideration and provided for, but the industries of the community in which the school is located must be represented in its program of studies.

2. There is a growing tendency for secondary schools to base their programs of study in part on the life and industries of the community. Thus, growing up in many cities are strong courses in commerce, mechanic arts, textile arts, and home making. The rural high school in an agricultural region, if it is to maintain an adequate standard of efficiency, must take into its program of studies agriculture and home making. The underlying purpose in the new program in Colebrook Academy is to utilize, as strictly educative means, studies based on the industries and activities of the community. In other words, a large part of the program of studies is built up and organized around agriculture and home making, which are the leading activities of this particular community.

A. CLASS IN COOKING.

B. A LESSON IN SERVING.

The purpose of the new program is well expressed in the following words of State Supt. H. C. Merrison:

> It ought to be borne in mind that the legitimate purpose of such high-school courses as these is not primarily to make good farmers, or skilled mechanics, or professional housekeepers. Their primary legitimate object is the education of the boy and girl to become a sincere and efficient and happy man and woman, capable of becoming an educated worker with material things, capable of getting life's happiness out of work rather than out of the leisure which comes after work, if indeed it comes at all. A further primary legitimate purpose is to educate the strongest youth toward the farm and the industries, instead of toward the professions and business exclusively. For these ends the courses utilize agriculture and the mechanic and domestic arts purely as educational material absolutely on a par with Greek, Latin, and mathematics. To become thoroughly efficient, the youth must still receive the training of specific technical instruction or of experience. But the pupil who has had four years of the kind of instruction recommended will not only be a better educated man, but a more intelligent and more efficient farmer, or mechanic, or housekeeper.

Again speaking of these courses he says:

> They are established in the belief that there is just as truly a cultural development of the individual to be had from competent instruction in agriculture or domestic science as from competent instruction in Latin.

It must be distinctly borne in mind that the fundamental purpose of these courses which Colebrook Academy offers is not vocational education, nor is there any tendency toward the trade school. The aim is the education of the boys and girls through these studies in the belief that in many localities they have greater educational value than the older traditional subjects.

3. The final purpose in the introduction of agriculture and domestic arts into the program as regular studies is to overcome a prevalent tendency to think of agriculture and home making as unworthy callings. On the contrary these arts should be exalted to an honorable place in the estimation of the youth of the land. Agriculture must be raised to a position of as great dignity as law, medicine, or engineering. Home making must be looked upon as a profession by the girls who go out from our secondary schools. Never will these schools be truly efficient in the highest degree until these great arts upon which the future welfare of State and Nation depend are given their proper place side by side with the older traditional subjects.

THE SCHOOL BUILDINGS.

Colebrook Academy has two buildings and a greenhouse in which its work is conducted. The old academy building, which was built soon after a charter was granted for the school by the legislature in 1832, has been remodeled and repaired and provided with a good basement. The main floor is now used for a gymnasium and the basement for the shops.

The new academy building is 105 feet long and 42 feet wide, with a 3-foot projection in front and two small projections in the rear. The building is two stories in height and has sufficient space finished on the third floor for the domestic arts department. There is also a good basement under the entire building. The foundation walls are constructed of concrete. The walls of the building are of brick, the outside course being of selected brick of dark red color. The trimmings throughout are of artificial stone of light gray, which in contrast with the dark red of the selected brick present a very pleasing effect. The roof is covered with Vermont green slate with copper flashing.

On the first floor of the building are the laboratory, the commercial room, typewriting room, library containing 6,000 volumes, superintendent's office, principal's office with private room, private toilet room for the offices, book room, and lady teachers' room. On the second floor are a large study room, with a seating capacity of 150 students, and 4 classrooms of sufficient size to accommodate 36 students each. The study room is located in the center of the building, with large windows on one side only, at the left of the pupils. There are corridors on this floor designed to be used as wardrobes. Coat and hat hooks are provided and a live steam pipe directly beneath them dries the clothes of the students in damp or rainy weather. The interior finish of the building is of North Carolina pine, and all floors are of hard wood. The entire building is wired for electricity and fitted with an electric bell system. The plumbing fixtures are of the most modern type, and there are sanitary drinking fountains in the basement and on the second floor. The study room and the classrooms are heated by indirect radiation, and the rest of the building by direct steam. The study and classrooms are ventilated into two large stacks. The cost of the new building, including the greenhouse, was $30,000.

Four features of this school plant are important, as they will belong to every rural high-school plant when these schools are fully readjusted to the needs of the community. These features are: (1) The greenhouse; (2) the dairy laboratory; (3) the domestic arts department; and (4) the shops, including a carpenter shop and a blacksmith shop.

THE GREENHOUSE.

Located on the south side of the building and connected with it by a covered passage is a greenhouse for use in connection with the courses in agriculture. It is 28 feet long and 18 feet wide. The greenhouse is heated by a special hot-water heater in the basement of the main building. The greenhouse contains soil benches around the walls on four sides, and a center bench with soil to the depth of 6 inches for experiments and for growing plants. The hot-water pipes are directly under the benches.

In the greenhouse much practical work is done in connection with the study of the elementary principles of plant life, soils, fertilizers, the selection and testing of seeds, the care of plants under glass, and, in fact, in nearly all of the work in agronomy and horticulture. The use of the greenhouse makes it possible to do a large amount of practical laboratory study in connection with these two courses. For example, an experiment in relation to the cultivation of beans was conducted during the past winter. The entire center bench was divided into six sections and planted with beans; each section was treated in a different manner as to fertilizer and cultivation. The crop was allowed to grow to maturity and at regular periods the boys were taken to the greenhouse for observation. Much material for class discussion was obtained in this way. A detailed description of this experiment is given in another part of this bulletin.

The cost of the greenhouse was $500; the heating apparatus cost $250 additional.

DAIRY LABORATORY.

The basement of the main building contains a dairy laboratory with cement floor, cabinets, tables, water connections, and suitable apparatus. The equipment, which will be described on a subsequent page, includes a Babcock milk tester, a De Laval separator, and a Sharpless separator.

DOMESTIC ARTS DEPARTMENT.

The school maintains a four-year course in domestic arts. The kitchen and dining room are located on the third floor. The kitchen is provided with two cooking tables so placed as to form an oblong with openings at each end. It will accommodate a cooking class of 12 girls. The room also contains a modern range and hot-water boiler, a porcelain sink, a large dish cupboard, and an ample drawer room. The sink is provided with both hot and cold water. The cooking tables are so constructed that each girl has the use of two table drawers, and below them a cupboard. Each student has individual equipment for her own use. Adjoining the kitchen is a commodious dining room adequately equipped for serving. The equipment for cooking and serving is as complete as would be found in the house of a family of average means. More would be unjustifiable.

THE SHOPS.

In the basement of the old academy building, which is situated just back of the new building, are two shops for the two courses in farm mechanics. One is the forge shop and is designed and equipped for teaching forging and farm blacksmithing. The other is the wood

shop, and in it a year's work is given in woodwork and farm carpentry. The carpenter shop is equipped with woodworking benches and a set of tools for each, and a general set of tools for the entire shop. The forge shop is equipped with hand forges, anvils, vises, and blacksmith tools, including a blacksmith's tap and die set. In these shops the boys in the agricultural curriculum have practice in woodwork and farm carpentry and forge work and farm blacksmithing throughout two years.

The two courses in farm mechanics have a threefold object: First, they aim to teach boys how to use their hands; second, to teach them the knack of using their hands to useful mechanical purpose; third, to acquaint them with so much of the art of the carpenter and blacksmith as to enable them to understand the structure of farm buildings and machinery and to make sundry repairs to the same.

THE SCHOOL GARDEN.

In the spring of 1911 the students of the class in agronomy planted about half an acre of land and successfully raised nearly all the kinds of crops that are raised in this climate.

THE FACULTY AND THE APPORTIONMENT OF THE WORK.

The faculty of Colebrook Academy consists of a superintendent, a principal, and five teachers. The superintendent has charge of the schools of a supervisory district, does no teaching, but closely supervises and directs the work of the school. The principal is directly responsible for the government and management of the school and teaches the same number of periods as the regular teachers. The principal and two of the teachers are graduates of college classical or literary courses and are competent to carry on the regular academic work of the school. The submaster is a graduate of the Massachusetts Agricultural College, with the degree of B. S. in agriculture, and is fully competent to teach the agricultural subjects. The domestic arts teacher is a graduate of the home economics department of Simmons College, Boston, Mass., with the degree of B. S., and has training adequate to fit her to teach the various lines of domestic arts which the school offers. The teacher of the commercial subjects is a graduate of the commercial course of the Salem (Mass.) State Normal School. Thus the same standard is maintained for the industrial work as for the academic work of the school. Each of the teachers received special training for the particular subjects which he teaches. Thus, and only thus, can satisfactory standards be maintained. The school fully meets the requirements for approval by the New Hampshire department of public instruction.

The State of New Hampshire pays to certain towns the sum of $2 a week for each teacher who has had professional training in a

A. CLASS IN SEWING.

B. CLASS IN TYPEWRITING.

normal school or who passes an examination in professional subjects. All but two of the teachers of the school have met this requirement, and all display superior professional spirit and attitude and more than ordinary pedagogical skill in presenting their subjects to their classes.

METHOD OF ADMINISTRATION.

The control of the school lies in the hands of a school board of six members elected by the people. These six men are active, intelligent, and successful business men of the town who take a deep interest in the schools and in whom the people have entire confidence. This board make the superintendent their executive officer and place in his hands the supervision, direction, and management of the school. Under the charge of the superintendent are, in addition to Colebrook Academy, the graded schools of the village, 12 ungraded schools in the farming section outside of the village, and the schools of Errol, a neighboring town. These two towns unite to form a supervisory district, so called in New Hampshire, and employ jointly a superintendent of schools. The State pays half the salary of the superintendent.

The work of the superintendent is entirely professional. He is selected from a list of persons approved by the State superintendent after a searching examination in professional subjects. He must also be a graduate of a registered college. The superintendent is elected by a joint board made up of the school boards of the towns in the supervisory district. The office of superintendent is not in any sense political.

The relation of the State to Colebrook Academy lies in the power of approval of secondary schools by the State superintendent. The suggestion that the course of study in the school should be modified and better adapted to community needs came from Mr. H. C. Morrison, the State superintendent. The new program of studies was mapped out by him, and the management of the school has continually had the benefit of his counsel and guidance.

THE LIBRARY.

The town library is in the school building and is used as a school library. It contains at the present time about 6,000 volumes, and the books are such as admirably to serve the needs of the school. A sufficient sum is appropriated each year by the town for the proper maintenance and increase of the library. By the use of the library it is possible to teach such subjects as history with due regard to extensive collateral reading.

PROGRAM OF STUDIES.

The four lines of work which the school maintains are embodied in the following courses of study:

AGRICULTURAL COURSE.

Year.	Subjects.	Periods per week.	Extent in years.
I	English	5	1
	Advanced arithmetic	5	1
	Agronomy	5	1
	Farm mechanics—Farm carpentry	10	1
II	English	5	1
	Practical mathematics	5	1
	Animal husbandry and dairying	5	1
	Farm mechanics—Farm blacksmithing	10	1
III	English	5	1
	Physics	5	1
	Horticulture	5	1
	Road building	5	½
	Forestry	5	½
IV	English	4	1
	American constitutional history	4	1
	Chemistry	4	1
	Rural economy and farm management	4	1
	Physiography: Geology and mineralogy	4	1

DOMESTIC ARTS COURSE.

I	English	5	1
	Advanced arithmetic	5	1
	Elementary sewing	10	½
	Elementary cooking	10	½
	Ancient history	5	1
II	English	5	1
	Dressmaking, millinery, and designing	10	1
	Biology	5	1
	French	5	1
III	English	5	1
	Household design and decoration	5	½
	Household mechanical appliances	5	½
	Household sanitation and hygiene	5	½
	Physics	5	1
	French	5	1
IV	English	4	1
	American constitutional history	4	1
	Chemistry	4	1
	Advanced cooking and dietaries	4	½
	Advanced physiology and hygiene and the elements of nursing	4	½
	Household economics	4	½
	French	4	1

COMMERCIAL COURSE.

I	English	5	1
	Commercial arithmetic	5	1
	Stenography	5	1
	Typewriting	5	1
	Ancient history	5	1
II	English	5	1
	Stenography	5	1
	Typewriting	5	1
	Commercial geography	5	½
	History of commerce	5	½
	French	5	1
III	English	5	1
	Bookkeeping and office practice	5	1
	Physics	5	1
	French	5	1
IV	English	4	1
	American constitutional history	4	1
	Commercial law	4	½
	Political economy	4	½
	Bookkeeping and office practice	4	1
	French	4	1

CLASSICAL COURSE.

Year.	Subjects.	Periods per week.	Extent in years.
I	English	5	1
	Ancient history	5	1
	First year mathematics	5	1
	Latin	5	1
II	English	5	1
	Second year mathematics	5	1
	French	5	1
	Latin	5	1
III	English	5	1
	French	5	1
	Latin	5	1
	Physics or chemistry	5	1
IV	English	4	1
	American constitutional history	4	1
	French	4	1
	Latin	4	1
	Review algebra	4	½
	Review geometry	4	½

DETAILED OUTLINE OF COURSES IN AGRICULTURE.

AGRONOMY.

1. Elements of plant life: Study of seed, root, stem, leaf, reproduction.
2. Soils: Origin, kinds, uses, soil water, plant food, care and improvement.
3. Seed selection and testing: Judging, germinating, analyzing.
4. Fertilizers and manures: Composition, value, relation to soils and crops, lime.
5. Insects: Kinds, harm, benefit, life habits.
6. Farm crops: Kinds, cultivation, uses, care.
7. General handling of field crops.
8. Experimental work in greenhouse.
9. Practical work in school garden.

The class plant a school garden in the spring in which all crops are raised which grow in this climate. This will develop into a farm for demonstration and practical work.

FARM CARPENTRY.

1. Construction and proper use of carpenter's tools.
2. Reading and drawing blue prints.
3. Plan for each article finished before construction begins.
4. Study of building plans and construction, with practice in estimating and figuring the cost.
5. Mechanical drawing.
6. Construction of wooden articles needed on farm and for home and school use.
7. Repairs to school building.
8. Practical work in construction and repairing.

FARM BLACKSMITHING.

1. Proper use and construction of blacksmith's tools.
2. Mechanical drawing, continued.
3. Study of iron and steel manufacture in an elementary way.
4. Hardening and tempering.
5. Study of typical farm implements, machinery, and so far as possible construction and repair of same.
6. Constant practical work at the bench and forge on useful articles of iron construction.

It is hoped to make these courses a means of better articulating the school with the community. The school plans to be of assistance to the farmers in the vicinity by making simple repairs to tools and machinery.

ANIMAL HUSBANDRY AND DAIRYING.

1. Types and breeds of farm animals: Horses, cattle, sheep, swine, poultry.
2. Principles and practice of breeding: Origin, improvement, care of farm animals and plants.
3. Feeds and feeding: Why, what, how to feed.
4. Structure and functions of the animal body: Systems of the body, and care.
5. Animal diseases, disinfection and general sanitation; prevention and cure.
6. Observing and scoring herds in vicinity.
7. Milk: Kinds, care, uses, composition.
8. The Babcock test: Theory and practice, use.
9. Essentials in good milk production: Cleanliness, care.
10. Market milk and cream: Kinds, uses, preparation, care.
11. Buttermaking.

HORTICULTURE.

1. Review of general principles of plant life, soils, fertilizers, and cultivation.
2. Greenhouses, hotbeds and cold frames: Principles, construction, and use.
3. Care of plants under glass, forcing and hardening.
4. More special study of (*a*) vegetable growing; (*b*) fruit growing; (*c*) flower growing.

The excellent greenhouse makes it possible to teach this course almost wholly by the practical method.

ROAD BUILDING.

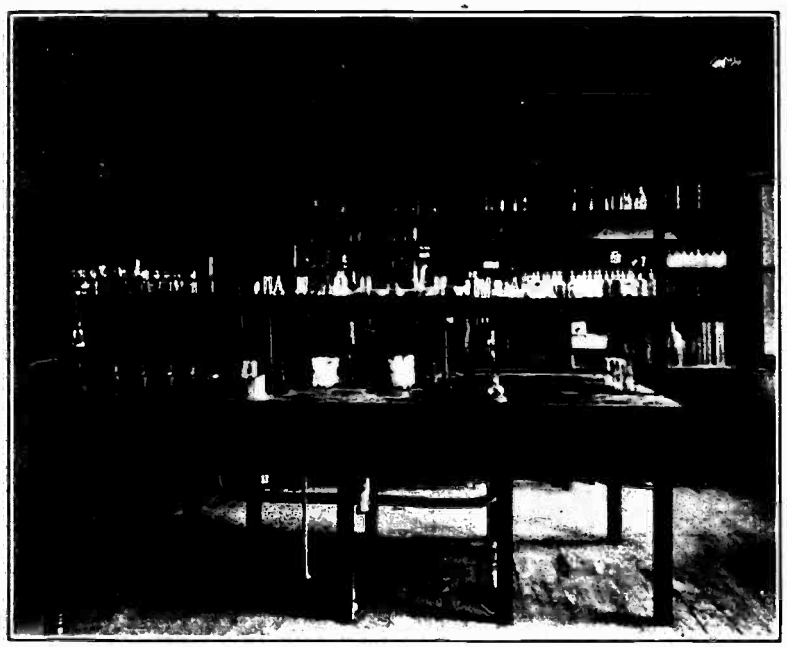
1. Essentials of a good road: Grades, solidity, water-shedding characteristics.
2. Road material and principles of construction.
3. Dirt, gravel, macadam, and telford roads.
4. Bridges, grades, cuts, and fills.
5. Projecting, laying out, and figuring cost of roads in the vicinity.
6. Fieldwork in observation of construction work in State highways in the vicinity.

FORESTRY.

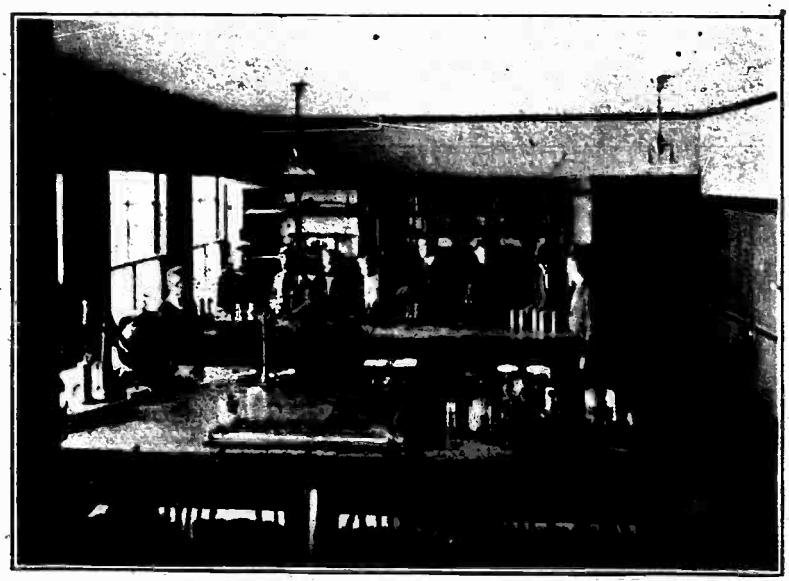
1. Study of New Hampshire forest types: Life history, associates, enemies of characteristic tree in each type.
2. Forest seeding and planting.
3. Management of the farm forest; the wood supply.
4. Management of Government forests.
5. Conservative lumbering.
6. Relation to stream flow and general rural conditions.
7. Practical field observation and lectures by experienced foresters and lumbermen.

RURAL ECONOMY AND FARM MANAGEMENT.

1. Farm accounting and bookkeeping: Value, methods, extent.
2. Farm management: Values, systems, management of farm and farm products.
3. Elements of rural law; legal relations of farmer to surroundings.
4. Conditions determining farm values.
5. Systems of cropping.
6. Marketing and transportation.
7. Management of fields and cropping.
8. Water supply and sewage.



A. THE CHEMICAL LABORATORY.



B. A LESSON IN WIRELESS TELEGRAPHY.

DETAILED OUTLINE OF COURSES IN DOMESTIC ARTS.

ELEMENTARY SEWING.

1. All cutting and stitching involved in sewing simple articles for dress and household, including the making of such articles as jabots, sewing bags, towels, aprons, doilies, handkerchiefs, kimonos; darning, mending, etc.
2. Sewing clothing cut by competent fitter.
3. Elementary machine sewing.

About one-eighth of the time is devoted to instruction and calculation. In this course no attempt is made to follow a set outline. It consists entirely of practical work and the various stitches are learned when needed.

DRESSMAKING, MILLINERY, AND DESIGNING.

1. Designing, cutting, and fitting of clothing.
2. Purpose and requirements of clothing; materials; selection of materials.
3. Instruction and practice in drafting, including the making of drawers, shirt waists, shirt patterns, etc.
4. Making gingham dress from pattern.
5. Materials used for hats.
6. Combination of colors and materials.
7. Relation of face to shape of hat.
8. Plates and drawings.
9. Designing of hat for pupil.
10. Selecting material and making a hat.

One-half of the time in this course is given to studying designs from sketches and prints, from the artistic point of view.

ELEMENTARY COOKING.

1. Management of coal, wood, and oil ranges.
2. Care of utensils, sink, and other apparatus.
3. Preparation and cooking of vegetables and cereals.
4. Use and cooking of eggs and milk.
5. Preparation of cheap cuts of meat.
6. Different methods of preparation of fish.
7. Batters and doughs, and preparation of muffins, popovers, bread, and similar articles.
8. Preparation of simple desserts, such as bread pudding, lemon jelly, tapioca cream, etc.
9. Preparation of simple menus.
10. Preparation and serving of simple dinners, including instruction in table setting, serving, etc.

Practically no attempt is made in this course to teach the chemistry of foods. The course consists of a maximum of concrete practice with a minimum of theory.

ADVANCED COOKING AND DIETARIES.

1. Canning and preserving from a bacteriological point of view, with practical work with material from the school garden; decays, molds, bacteria, sterilization, etc.
2. Composition, structure, methods of cooking vegetables; place in diet; practice in cooking vegetables.
3. Cereals: Methods of cooking as governed by composition and commercial preparation; practice in preparation of various cereals.
4. Milk: Value as food; effect of heat as to physical changes, digestibility, and preservation; practice.

5. Eggs: Composition, place in diet, preservation; practice in preparation in various ways.

6. Meat and fish: Chemical composition, economy, place in diet; methods of preparation.

7. Practice with batters and doughs, with the study of grains and of leavening agents.

8. Preparation of salads; importance in diet.

9. Desserts: Relation to preceding courses in menu; practice in the preparation of both cold and hot desserts.

10. Food values; chemistry and biology of cooking; preparation of economical dietary; food combinations; relation of occupation to food requirements.

11. Practical work in serving.

During this course a number of dinners have been served by the class to the school board and their wives, and to invited guests. Refreshments have also been served at various school functions. Considerable attention has been given to proper food combinations and to the cost of the various menus prepared. Correct methods of serving have been emphasized.

The following are typical menus of dinners which were actually served:

I.

Tomato bouillon. Croutons.
Beef loaf. Scalloped potatoes.
Macedoine of vegetables.
Turnip. Squash. Onions.
Fruit salad. Baking powder biscuits.
Coffee jelly. Sponge drops.
Café noir.

II.

Potato soup. Crisp crackers.
Casserole of beef. Tomato sauce.
Mashed potatoes. Celery. Olives.
Fruit salad. Ribbon sandwiches.
Chocolate soufflé. Rolled cookies.

III.

Pea soup. Imperial sticks in rings.
Jellied chicken with gravy. Boiled potatoes.
Turnip. Creamed onions.
Cranberry jelly.
Fruit salad. Parker House rolls.
Spanish cream. Palm leaves.
Confections. Salted nuts.
Café noir.

IV.

Corn soup. Crisp crackers.
Beef croquettes. Tomato sauce.
Dandelions. Mashed potatoes.
Fruit salad. Parker House rolls.
Boiled custard. Cake.
Wafers. Coffee.

A. A CORNER OF THE BLACKSMITH SHOP.

B. A CORNER OF CARPENTER SHOP.

HOUSEHOLD DESIGN AND DECORATION.

1. The history of the development of the house; study of the various types of dwellings; condition of the various periods as reflected in the architecture.

2. The location of the house.

3. The elementary principles covering the structure of the house; location of stairs, chimneys, supporting walls, partitions, floors, and roof beams.

4. Exterior and interior finish.

5. The plan of the house.

6. The decoration of the house; brief study of ancient art; color schemes; practice in drawing and furnishing rooms.

7. Furnishings and furniture of a house; wall papers, carpet and rug designs, and general color schemes; study of furniture, covering both serviceableness and artistic values.

This course is closely correlated with drawing and, in fact, is about equally based on drawing, study of plans and catalogues, and study of practical home problems. Each girl makes representations of the rooms of a house on large sheets of heavy paper, selects, from catalogues, pictures of furniture, carpets, rugs, etc., and pastes them on the model in the proper place. From sample books of wall paper she selects her paper for the walls. She figures the cost of furnishing and decorating the house. The girls are allowed to use their own ideas in working out the color schemes and in determining the cost.

HOUSEHOLD MECHANICAL APPLIANCES.

1. Elementary scientific principles underlying ventilation, heating, plumbing, lighting, the refrigerator, thermos bottles, sewing machine, double boiler, egg beater, ice-cream freezer, fireless cooker, and various other mechanical appliances used in the house.

This course deals especially with the scientific principles involved in these mechanical appliances and is of the nature of applied physics. The educational value of a course of this kind for girls is obvious. The girl sees the practical application of the principles which she studies in those things with which she comes in contact in her daily life in the home.

HOUSEHOLD SANITATION AND HYGIENE.

1. Water: Danger from contamination; sanitary principles underlying care of plumbing and drainage systems.

2. The sanitation of the house: Kitchen, dining room, bed room. Insect pests.

3. Public and private health: Disinfectants, antiseptics, and deodorants; collateral reading on various epidemics and consideration of various methods of transmitting disease.

4. Water, milk, and food: Source of production and methods of handling; opportunities for contamination and spread of disease; legal requirements regarding food.

5. General consideration of sanitation and hygiene as related to the home and to public health.

In this course all of the problems of the home, such as those of light, ventilation, heat, dust, and sewerage, are studied from the point of view of sanitation and hygiene.

HOUSEHOLD ECONOMICS.

1. Household accounts: Various methods of bookkeeping; brief study of banking and its relation to the housewife; practical instruction in connection with the school bank; practice in use of check book.

2. Income: Each member of the class is given an imaginary income and is required to furnish house, clothing, and food for a family of stated size for a year, dealing at current prices.

3. Marketing: Vegetables and groceries; comparison of various cuts of meat; study of first and second quality; values; local and department stores.

4. Household arithmetic.

COURSES IN MATHEMATICS.

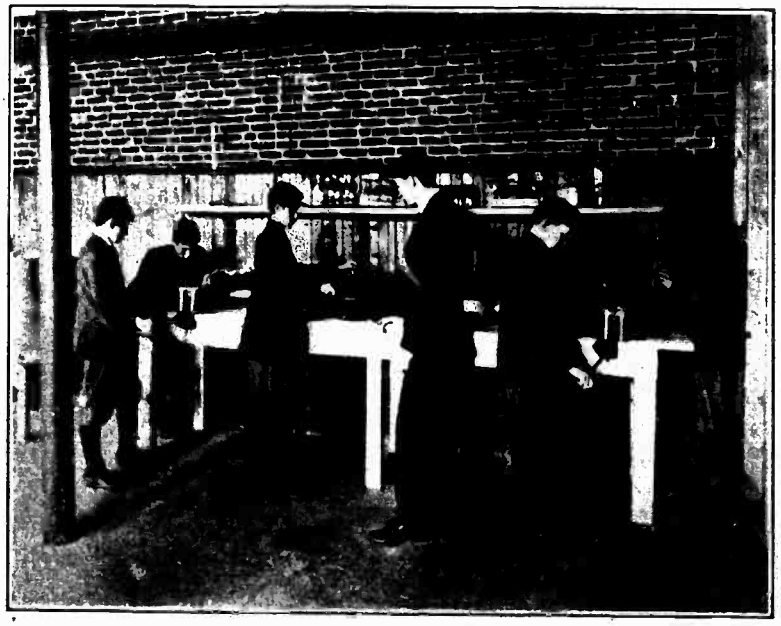
Colebrook Academy does not require that every boy and girl shall pursue courses in algebra and geometry. In fact, the traditional courses in these subjects have been thrown overboard and the mathematics instruction has been reconstructed. The following courses in mathematics are now offered by the school:

1. In the college preparatory course, in place of the algebra of the first year and the geometry of the second year, arithmetic, algebra, and geometry are taught concurrently. The main emphasis in the first year is on algebra with some related geometry; in the second year on geometry with the infusion of a good deal of associated algebra. Those parts of geometry and algebra which are too difficult for high-school students have been omitted. The whole subject has been made more concrete and practical and is related in a more vital way to the experiences of life. The particular excellencies of the courses in mathematics as taught from this point of view are as follows: (*a*) The subject is within the grasp of the average boy and girl and is intelligible to them; mathematics has a meaning; the formal manipulation of the abstract symbols of algebra and memorizing the formal proofs of geometry are avoided; (*b*) the interweaving of both algebra and geometry renders it possible for algebra to come to the assistance of geometry by expressing the facts of geometry and for geometry to make algebra more intelligible by illustrating the facts of algebra; (*c*) the whole subject of mathematics in its development follows somewhat closely the genetic order, that is, the order of development of the mind of the pupil, which makes the whole learning process more rational and economic; (*d*) the college entrance requirements are fully covered; (*e*) the student does not drop his algebra at the end of the first year, but his grasp on it continues to increase during the second year, so that he is better prepared for further work of an algebraic nature in the third or fourth year of his course; (*f*) the pupil manifests greater interest in mathematics and develops superior mathematical ability.

2. The students of the agricultural course take neither algebra nor geometry. In the first year they have a course in advanced arithmetic, which aims to be distinctly practical. It includes a review of elementary arithmetic and the advanced applications of the subject. Such processes are taught as have a direct relation to the after lives of the pupils. Problems are selected which deal with actual situations and which grow out of the pupils' experiences.

3. In the place of the geometry of the second year the agricultural students take a course called practical mathematics, which includes three lines of work: (*a*) The algebra of the equation; (*b*) the applications of geometry to practical measurements; (*c*) the elementary principles of surveying.

A. A LESSON IN THE USE OF THE SEPARATOR.



B. MAKING THE BABCOCK MILK TEST.

4. The domestic-arts girls take arithmetic in the first year and no mathematics thereafter except what they get in the regular domestic arts work. The same is true of the students in the commercial course.

WORK IN THE GREENHOUSE.

It is the plan to make the greenhouse of as great practical value as possible. With that end in view, it is used as a laboratory for work in connection with agronomy and horticulture. To illustrate how this is done, several typical lines of work will be described, although space forbids more than a brief hint at the various activities.

In an experiment with a bed of string beans the bed was divided into 6 equal sections, each 3 feet long and 2 feet wide and numbered from 1 to 6. An application of wood ashes was given to Nos. 1, 2, and 3, but not to the others. The plots were then taken in pairs, each pair being treated differently. One pair, Nos. 1 and 4, received a solution of commercial ammonia much diluted with water. The second pair, Nos. 2 and 5, received a treatment of commercial fertilizer. The third pair, Nos. 3 and 6, was reserved as a check plot. No fertilizer was applied to this except the wood ashes on No. 3. The amount of fertilizing material was measured in each case by the pupils, and they were required to determine the proportional amount for an acre and the cost per acre of such application at current prices. This is believed to be one of the valuable parts of the work. At the end of the experiment the pupils were required to write it up, fully describing how the experiment was carried out, and the kinds and amounts of fertilizers used. They were then asked to assign reasons for the differences in the crop on the different plots. For instance, why was it that the ammonia plot developed more rapidly than the others? The answer given was that, since the plant food in the ammonia was more available than in the other materials applied, the plants on that plot had a better opportunity to grow quickly. The plot with no fertilizer gave the poorest results, and this was ascribed to the fact that there was actually less plant food in that plot than in the others.

Following this experiment, another crop of beans was planted in the same bed, which was divided in the same way into plots. This time no fertilizing material was added, as it was desired to determine whether all the fertilizing material had been available for the first crop or whether some of it still remained; and, if any remained, which material became available the most slowly.

In this experiment there was found to be less difference than in the first between the ammonia plot and the check plot. The class decided that this was because a large proportion of the ammonia was used up in the first crop, so that the actual plant food found in each plot was more nearly equal. This time the commercial fertilizer crops came

out ahead and the pupils felt that this must be because all the food was not available for the first crop but had become more available for the second, and so had given those two plots more actual plant food than the other plots had.

Another typical experiment was carried on with lettuce. A long bed was divided into four equal plots. Each plot was given a different nitrogen fertilizer, but otherwise they were treated alike. The object was to determine which kind of fertilizer would bring the lettuce most quickly to selling size. As far as could be judged there was no difference in the plots when the experiment was concluded, and the class wrote that as far as they could see the fertilizers were of equal value as far as growing lettuce was concerned, and they would, therefore, buy the cheapest.

That the boys are thinking the work out for themselves and not following a text or the instructor is shown by the fact that one pupil in his discussion of the experiment criticized it in this way:

> There was no check plot and, therefore, it is impossible to decide whether or not the fertilizers were of any advantage to the crop.

Another experiment was conducted to find the effect of different nitrates upon cucumbers.

In all their experiments the class work out the amount of fertilizing material per acre equivalent to the amount applied to the plot, and its cost, so that they can determine the relative cost of different plots as well as the relative yield. It is the desire of those in charge to make as practical an application of the work as possible.

Another typical and important part of the agricultural work is seed testing. Several ears of corn were given to each pupil, and all were required to make vitality tests. First, they learned why it was desirable to test corn, and then why the method used was a fair one. Each ear was treated as all others. The corn used was 8-rowed flint. One kernel was taken from each row, taking them as evenly as possible from tip to butt; all the kernels from each ear were put in the same section of a shallow box which had previously been marked off by strings into squares of about 3 inches. The boxes were then set away and the corn allowed to sprout. After sufficient time had been given, the boys went through the squares and counted the number of kernels which had sprouted. Whenever all 8 kernels had sprouted, the ear from which those kernels had been taken was preserved, to be used for seed. If only 7 or less developed, the ear was not saved. To finish this experiment one more step remains, namely, to plant all the kernels from the ears from which all 8 kernels have previously sprouted. This is to find out if the development of 8 kernels indicates that all the kernels on that cob have life.

Another experiment in the greenhouse was to determine if transplanting affected development and whether the time of transplanting

affected the size of plants. Lettuce and tomatoes were used in this experiment. A crop of each was sown. After coming up, a definite number of plants were transplanted at intervals of a week or 10 days. A few were left in the original rows as a check. It was found that those plants which were transplanted first were the quickest to mature, and developed to greater size. This was ascribed to the fact that as soon as transplanted the plants had more room, and therefore more food.

Each experiment is planned to bring home to the class some truth about the action of the soil, crop, or fertilizer. Thus, while they are learning certain facts from their texts and class discussions, they see actual evidence in the growing plants to show that the facts are true.

It should be pointed out that some of the crops that are planted should fail if the work is to have the greatest value for the pupil. Wrong methods of cultivation and handling crops must be shown as well as the correct methods.

SIGNIFICANCE OF THE MOVEMENT.

A secondary school, whether located in a city, village, or rural hamlet, should be a source of strength to the community. The city or village in which a secondary school is located and the entire section of the country directly tributary to the school should continually grow stronger as a direct result from the school. The school should constantly put back into the community the best of each generation as permanent residents if it is to justify its own existence and the taxation necessary for its maintenance.

That rural secondary schools have been in many instances a source of weakness to the communities which have supported them and a direct means of taking out of the community the very manhood and womanhood so necessary to the future prosperity of State and Nation is one of the saddest aspects of modern education. State Supt. Morrison has forcibly brought this fact home to the people of New Hampshire. In his biennial report for 1907–8 he showed that the high schools and academies of the State have been for generations the means of drafting away the best blood of the rural sections. Supt. Morrison puts the matter in these words:

> During the first three-quarters of the nineteenth century every group of three or four towns had its academy, usually an endowed institution. Out of these academies went a steady stream of sons and daughters who were, other things being equal, always the strongest of the generation, for otherwise they would not have gained this education. Seldom did they settle upon the old farm or in the home town. Their education had fitted them for other things.
>
> They became lawyers, or physicians, or clergymen, or schoolmasters, or business men in the cities, and the girls went with them, prevailingly to be their wives. Their children grew up under city conditions and went to city schools. The unambitious, the dull, the unfortunate boys and girls of the old countryside, who could not get to the

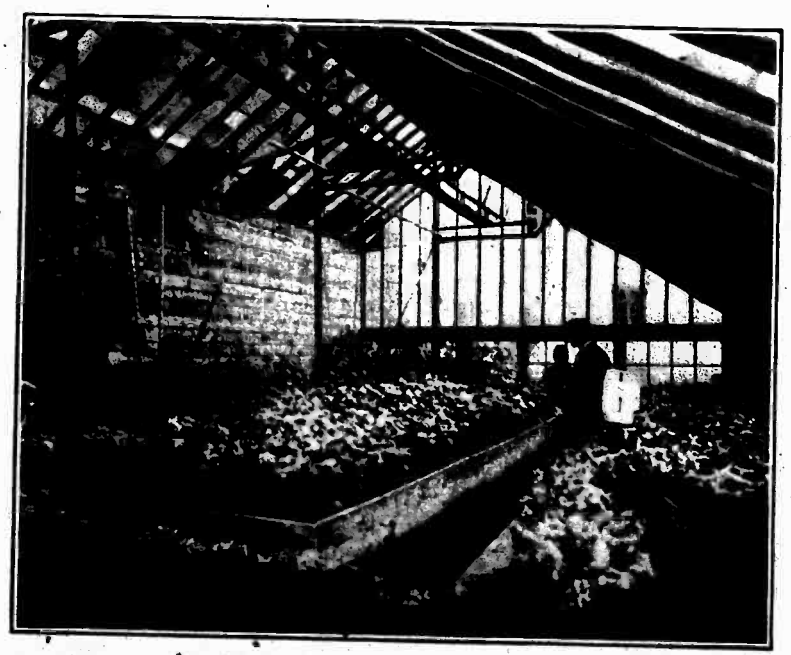
academy, as a class, remained behind and became the dominant stock. And they reproduced their kind for another generation, upon whom the same sorting process was carried out. Then the factory system seized upon the strong limbed and restless, albeit slow-witted, and began to sort them out and remove them. Finally, the Civil War came and struck down the idealists by the wholesale, mostly boys or young men who had not yet reproduced themselves in a new generation. Now upon a journey through rural New England you shall see fine old mansions, showing by their architecture that they date back well toward the beginning of the nineteenth century, and ample old homesteads with their capacious barns, all of them more or less in a state of decay. Of many, nothing but the cellar hole and ah, at first sight, unaccountable orchard is left. These were the homes of a race which lived and prospered, which cleared the land, and built homes, and added barn to barn, which accumulated wealth, and gave virile expression of itself in church, in state, and in educational institutions * * *. But that race allowed its sons and daughters to be educated away from the farm and the country and from the State. In their place to-day we too often have a dwindling town, a neglected farm, a closed church, an abandoned schoolhouse.

The solution of this problem of the welfare of the rural sections of New England is a matter of great importance not only to the educator but to all classes of people. It is believed that the solution will come by means of a change in the type of secondary education. High schools and academies, with good courses in agricultural education for the boys and domestic arts for the girls, should create an interest in the farm and the home and their problems, and, by giving an education which prepares for the problem of life under home environment, will tend to check the present cityward trend of population. In this seems to lie the solution of one of the most vital and, in its consequences, one of the most far-reaching problems facing our people at the present time.

When the boy finishes the high-school course, if he is not one of the few who can go to college, he finds himself equipped with an interest in the problems of the farm, with an appreciation of the value of farm life, with a conception of the dignity of scientific agriculture as a profession, and with an attitude toward farm life which is entirely different from that of those who have been for four years educated away from the farm and the home and who have been taught that only with the brain can a living honorably be made. When farming is raised to the dignity of a profession, by the introduction of scientific methods, the trend of population toward the city will in some measure cease.

The rural high school has a most important part to play in that tendency known as "the country-life movement," the aim of which is to make "rural civilization as efficient and satisfying as other civilization." Great responsibility rests upon it and upon those who have its management in charge. It can not meet this great responsibility unless its program of studies is reconstructed along lines calculated to bring about a readjustment to the real needs of the community. If this is done along rational lines the rural high school may be a powerful factor in developing and strengthening rural civilization.

A. SECURING SAMPLES OF SOIL AT DIFFERENT DEPTHS.



B. A LESSON IN THE GREENHOUSE.

APPENDIX.

INDUSTRIAL EQUIPMENT OF COLEBROOK ACADEMY.

KITCHEN EQUIPMENT.

	Cost.
1 Magee Oxford range, No. 880	$35.00
1 copper boiler to accompany range, labor and piping	26.00
1 porcelain sink	15.00
2 cooking tables	73.00
12 stools	9.00
8 3-burner oil stoves	14.00
1 mop wringer	1.75
1 mopstick	.25
1 dustpan	.25
1 counter brush	.25
1 broom	.35
1 teakettle	1.10
2 butter crocks	.70
1 bean pot	.20
1 fry kettle and basket	.90
1 iron gem pan	.30
6 dish pans	1.02
1 garbage pail	1.15
1 sink strainer	.20
1 tin dipper	.10
1 small washboard	.20
1 white enamel kettle	1.20
1 pair scales	1.50
2 agate double boilers	1.70
12 1-quart double boilers	5.64
1 large frying pan	.35
6 1-quart saucepans	.90
12 small frying pans	1.20
1 teapot	.80
1 coffeepot	.75
1 flour sieve	.20
1 chopping bowl	.25
1 chopping knife	.10
1 washdish	.35
24 bowls	2.40
24 popover bowls	1.68
6 baking dishes	.60
1 skimmer	.25
6 vegetable mashers	1.32
2 pancake turners	.20
24 teaspoons	.40
12 tablespoons	.40
24 wooden spoons	.96
12 paring knives	1.00
12 palette knives	1.20
12 case knives	1.00
12 forks	.50
12 tin measuring cups	.60
6 glass measuring cups	.60
2 lemon squeezers	.20
6 2-quart jars	.66
6 small baking dishes	.60
12 vegetable brushes	.60

KITCHEN EQUIPMENT—continued.

	Cost.
6 soap shakers	$0.60
12 tin plates	.35
1 wire sieve	.10
1 nutmeg grater	.05
1 can opener	.10
6 biscuit cutters	.30
6 cookie cutters	.30
12 skewers	.15
12 tin plates	.35
6 Dover egg beaters (small size)	.60
6 molding boards	3.00
6 rolling pins	.60
12 white dinner plates	1.40
3 pie plates	.30
12 white cups and saucers	1.40
3 pitchers	.75
12 pepper boxes	1.20
1 wire masher	.10
1 steel	.25
4 bread pans	.40
4 cake pans	.40
23 yards crash	2.02
6 yards cheesecloth	.30
1 yard ticking	.18
1 meat chopper	1.50

DINING-ROOM EQUIPMENT.

1 extension dining table	6.50
12 dining chairs	18.00
6 yards damask	3.90
18 napkins	2.25
2 yards silent cloth	1.00
24 Rogers Bros. teaspoons	4.00
12 dessert spoons	4.20
6 tablespoons	2.25
12 knives	3.50
24 forks	7.00
1 butter knife	.50
1 sugar shell	.55
1 butter dish, cream pitcher, and sugar bowl	5.00
2 sets salt and pepper shakers	1.40
12 glasses	.50
1 glass pitcher	.50
12 dinner plates	2.20
12 soup plates	2.10
12 tea plates	1.25
12 butter plates	1.20
12 sauce dishes	1.20
12 cups and saucers	2.40
2 covered vegetable dishes	2.70
2 platters	1.20
2 pitchers	1.80
2 jardinere trays	.70

CARPENTER-SHOP EQUIPMENT.

	Cost.
6 Larsson adjustable benches, No. 5	$60.00
6 pencil compasses, No. 124	.90
6 drawing kits	3.60
6 2-foot rules	1.20
6 sloyd knives	2.00
6 marking gouges	1.50
3 spokeshaves	.90
18 firmer chisels—6 ¼-inch, 6 ½-inch, and 6 1-inch	6.48
6 iron-bound try-squares, 6-inch	1.50
2 backsaws, 10-inch	2.00
6 splitting saws, 22-inch	8.52
3 iron block planes	2.64
6 iron-throated wood-body planes	6.60
1 bench hook	.25
6 brushes	1.50
6 clips to hold drawings	1.50
2 screw drivers, 10-inch	.80
2 screw drivers, 4-inch	.44
3 screw drivers, 8-inch	1.05
2 screw-driver bits	.30
3 cutting-off saws, 22-inch	4.26
2 turning saws and frames, 10-inch	1.90
3 turning saws and frames, 12-inch	3.00
2 iron-handled compass saws	.40
1 iron jointer, 22-inch	2.55
2 iron smooth planes, 8-inch	2.80
2 iron jack planes, 15-inch	3.50
3 bit braces, 8-inch	3.45
1 bit brace, ratchet, 8-inch	1.50
21 Jennings bits, 3 each 1/4, 3/8, 1/2, 5/8, 3/4, and 1 inch	8.31
6 drill bits, 3 each 1/4 and 1/8 inch	.84
2 drill bits, 1/16-inch	.28
6 center bits, 2 each 1/2, 3/4, and 1 inch	.51
2 Clark's countersinks	.66
2 pairs 10-inch dividers	.76
2 pairs 6-inch dividers	.56
6 marking awls	.90
6 brad awls	.60
4 firmer chisels, 2 each 1/2 and 1 1/2 inch	1.64
4 firmer chisels, 2 each 1/4 and 1/2 inch	1.00
2 gouges, 1 1/2-inch	1.10
6 gouges, 2 each 1/2, 3/4, and 1 inch	2.30
1 gouge, beveled inside, 3/4-inch	.42
3 hand bast files, 8-inch	.88
3 half-round files, 8-inch	1.02
2 round files, 8-inch	.46
2 file cards	.30
4 bevels, 10-inch	2.20
1 mortise gauge	.55
6 hammers	2.70
6 nail sets	.60
3 skew chisels, 1/2-inch	1.20
1 parting tool, 1/4-inch	.45
3 veiners, 1/4-inch	1.35
4 draw shaves	2.00
3 mallets, 2 1/2-inch face	1.20
2 drawing knives, 8-inch	1.60
32 cabinet scrapers, regular 2 1/2-inch Jennings	.40
1 cabinet scraper, special	.20
2 cabinet clamps, 3-foot	1.50
2 rose countersinks	.40
3 oilstones	1.00

CARPENTER-SHOP EQUIPMENT—continued.

	Cost.
5 oil cans	$0.30
4 slip stones	1.00
2 hand screws, 10-inch	.70
2 hand screws, 14-inch	1.20
3 iron clamps, 4-inch standard	.75
1 pair winding sticks	.30
6 try-squares, 12-inch	2.70
1 grindstone	5.50
1 set carving tool slips	1.00
1 rabbet plane	1.20
1 pair carpenter's pincers, 7-inch	.35
1 matching plane for 1/2-inch stock	2.00
1 wooden dado plane, 3/4-inch	1.50
1 saw clamp dikeman	1.25
1 saw set	.50
1 dozen taper files, 6-inch	1.00
1 framing square	.80
1 monkey wrench, 8-inch	.60
1 expansion bit, 1/2 to 3 inch	.85
1 hatchet	.60
1 framing chisel, 1/2-inch	.55
1 pair cutting pliers, parallel jaws, 5 1/2-inch	1.10
1 burnisher	.35
1 hack saw, 8-inch	.05

BLACKSMITH-SHOP EQUIPMENT.

3 hand forges	66.00
3 anvils, 50-pound	15.00
2 anvils, 100-pound	20.00
4 vises, 4-inch	26.00
1 blacksmith's vise	8.00
3 pair tongs, 16-inch, No. 5060	1.20
3 pair tongs, 16-inch, No. 5070	1.80
3 pair tongs, 16-inch, No. 5090	1.80
3 pair tongs, 16-inch, No. 5001	3.00
3 top swagers, 1/2 to 1/4 inch	1.20
3 bottom swagers, 1/2 to 1/4 inch	1.20
3 top fullers, 1/2 to 1/4 inch	1.20
3 bottom fullers, 1/2 to 1/4 inch	1.20
3 square flatters, 1 1/2-inch	1.05
3 cold chisels, 1-inch	.90
3 hot chisels, 1-inch	.90
3 hardies, 1-inch	1.80
3 hand hammers	1.95
3 ball pein hammers	2.10
1 blacksmith's tap and die set	8.00

AGRONOMY EQUIPMENT.

3 spading forks	3.25
12 hoes	4.75
3 spades	1.65
3 square shovels	1.80
3 long-handled round-pointed shovels	1.50
3 short-handled round-pointed shovels	1.50
1 pick	.75
2 crowbars	1.50
6 rakes	2.40
1 augur with extended handle for deep-soil sampling	2.50
12 pint jars for soil sampling	.90
12 glasses	.50
12 6-quart milk pans	.60
12 shallow cake tins for seed germinating	.25

AGRONOMY EQUIPMENT—continued.

	Cost.
6 6-inch glazed flower pots	$0.50
6 4-inch flower pots with saucers	.30
5 yards flannel cloth for seed germinating	.45
¼ pound each of various seeds	
1 set school seeds[1] and case	1.75

DAIRY LABORATORY EQUIPMENT.

1 Richmond slide rule	2.00
1 30-pound scale	1.80
1 No. 628 cream scale	2.70
1 No. 629 cream scale	4.20
24 10 per cent test bottles	1.50
24 30 per cent test bottles	2.00
24 Ohlsson skim-milk bottles	7.00
12 pipettes	1.00
1 automatic pipette	.50
2 18 ccm. pipette	.17
2 5 ccm. pipette	.17
10 acid measures	.50
1 Troemner scale No. 606	7.20
12 ½-pint milk bottles	.35
12 1-pint milk bottles	.45
12 1-quart milk bottles	.60
1,000 A grade caps for milk bottles	.25
1,000 No. 2 corrosive sublimate tablets	.90
1 10 per cent bottle tester	.55
1 30 per cent bottle tester	.70
1 sample dipper	.25
3 pinch cocks	.30
1 60-pound scale by 2 ounces	2.25
1 milk thief	.35
10 pads, Babcock test blanks	1.25
2 1-gallon dippers, short handles	1.50
12 manila sheets	.25
1 gallon separator oil and can	.41
1 combination acid bottle	2.25
1 12 by 17.5 ccm. burette	2.00
1 stand for burette	1.00

DAIRY LABORATORY EQUIPMENT—continued.

	Cost.
1 cone graduate, 6-ounce and ccm	$1.00
2 6-ounce graduates	.30
1 gallon acid	.70
10 pair Babcock test dividers	2.50
10 funnels for test bottles	1.00
12 No. 18 brushes (for test bottles)	.20
1 dozen composite test jars (pint)	1.50
1 4-gallon stoneware jar	.50
1 dozen ounce bottles for drivers' case	.50
1 burette and stand, 12 by 17.5	3.00
2 No. 7 brushes and handles	.55
2 extra heavy aprons	1.66
2 No. 9 brushes	.30
2 vat scrub brushes and handles	.55
3 common lactometers	.62
1 Quevenne lacto thermometer	.75
3 special dairy thermometers	.82
4 12 by 2 plain jars	.87
1 alkaline test, complete	2.10
1 8-bottle tester, complete	7.50
2 4-bottle testers, junior	7.50
1 New York State Spence lacto-thermometer	1.25
1 De Laval cream separator, No. 12	
1 Sharpless cream separator, No. 4	
2 14-quart pails	1.30
1 acidometer	.35
1 No. 3 aerator	4.00
1 No. 2 Water's butter worker	6.75
1 No. 1 Belle churn	2.70
1 No. 2 1-pound mold and stamp	1.60
C. A. stamp	.24
10,000 8 by 11 parchment squares	.88
4 No. 7 ladles	.34
2 No. 3 spades	.17
3 4-ounce bottles butter color	.45
500 plain cartons	1.10
12 patron's pass books	.12

BOOKS USED IN TEACHING AGRICULTURE.[2]

AGRONOMY.

Essentials of Biology—Hunter.
First Principles of Agriculture—Goff and Mayne.
Practical Agriculture—James.
The First Book of Farming—Goodrich.
The Soil—King.
Agriculture for Common Schools—Fisher and Cotton.
An Introduction to Agriculture—Upham.
First Principles of Soil Fertility—Vivian.
Soils—Lyon and Fippen.
Elements of Agriculture—Warren.
Practical Agriculture—Wilkinson.
Agriculture for Beginners—Burkett, Stevens, and Hill.
Practical Nature Study—Coulter and Patterson.
Soils and Crops: A Manual of Agronomy—Barto.
Principles of Agriculture—Bailey.
The Potato—Fraser.

ANIMAL HUSBANDRY.

Agriculture, Vols: I, II, and III—Brooks.
Animal Feeding—Shaw.
Feeds and Feeding—Henry.
Types and Breeds of Farm Animals—Plumb.
Judging Live Stock—Craig.
Farm Animals—Wilcox.
Principles and Practice of Poultry Culture—Robinson.
Domesticated Animals and Plants—Davenport.
Youatt and Spooner on The Horse—Randall.
The Horse: How to Buy and Sell—Howden.
Farm Stock—Burkett.
Key to Profitable Stock Feeding—Myrick.

HORTICULTURE.

The School Garden Book—Weed and Emerson.
Vegetable Gardening—Green.
Popular Fruit Growing—Green.

[1] These sets of school seeds are given to schools by the United States Department of Agriculture. The set consists of 100 samples of seeds which are of interest to the farmer. Each sample is put up in a small glass bottle and labeled with the common and the botanical name. The bottles and the case in which the bottles are kept cost $1.75.

[2] This list of books is not intended to be complete, but is given merely to show what is considered necessary for teaching these courses.

HORTICULTURE—continued.

Farm and Garden Rule Book—Bailey.
The Orchard and Fruit Garden—Powell.
Systematic Pomology—Waugh.
The Principles of Fruit Growing—Bailey.
The Pruning Book—Bailey.
The Nursery Book—Bailey.
The Apples of New York, Vols. I and II—Beach.
Principles of Vegetable Gardening—Bailey.
Amateur Fruit Growing—Green.
The American Apple Orchard—Waugh.
Fruit Harvesting, Storing, and Marketing—Waugh.
Greenhouse Management—Taft.
Greenhouse Construction—Taft.
Vegetable Gardening—Watts.
The Forcing Book—Bailey.
Diseases in Plants—Ward.
Spraying Crops—Weed.
Plant Breeding—Bailey.
Principles of Breeding—Davenport.
Encyclopedia of Agriculture—Bailey.

DAIRYING.

Testing Milk and its Products—Farrington and Wool.
Principles and Practice of Butter Making—McKay and Lars
Practical [illegible] Bacteriology—Conn.
First Lessons in Dairying—Van Norman.
The Business of Dairying—Lane.
A Dairy Laboratory Guide—Ross.
The Farm Dairy—Gurler.

MISCELLANEOUS.

Farm Blacksmithing—Drew.
Standard Blacksmithing—Holmstrom.
Corn—Bowman and Crossley.
Farm Crops—Burkett.
Chemistry of the Farm—Warrington.
Manual of Corn Judging—Shamel.
Bookkeeping for Farmers—Atkeson.
Farm Drainage—French.
Silos, Ensilage, and Silage—Miles.
Forest Planting—Fuller.
Insects Injurious to Vegetables—Phittenden.
Forage Crops—Voorhees.
First Book of Forestry—Roth.
Handbook of Trees in New England—Dame and Brooks.
Practical Forestry—Gifford.
Practical Forestry—Fuller.
The Tree Doctor—Davey.
Diseases of Animals—Marshall.
The Farmer's Veterinary Adviser—Law.
Barn Plans—Radford.
Electricity on the Farm—Conlee.
Laboratory Exercises in Farm Management—Bailey.
Farm Friends and Farm Foes—Weed.
Farm Management—Card.
Physics of Agriculture—King.
Forage and Fiber Crops in America—Hunt.
The Cereals in America—Hunt.

BOOKS USED IN TEACHING DOMESTIC ARTS.

SEWING.

Hand Sewing Lessons—Krolik.
Textiles—Dooley.
Goodwin's Course in Sewing: Books I, II, and III.
The Textile Fibers of Commerce—Hannan.
Encyclopedia of Needle Work—Day and Buckle.
Sewing and Garment Drafting—Blair.
Textiles and Clothing—Watson.
How the World is Clothed—Carpenter.
Color, Harmony and Contrast—Ward.
School Needlework—Hapgood.
Butterick Pattern Co.: Dress Making up to Date.
Embroideries and their Stitches.

HOUSEHOLD SANITATION AND HYGIENE.

Household Bacteriology—Elliott.
Household Hygiene—Elliott.
Chemistry of the Household—Dodd.
Personal Hygiene—Le Bosquet.
Home Care of Sick—Pope.
Cleaning and Renovation—Osman.
Principles of Sanitation and Public Health—Bailey.
Sanitation in Daily Life—Richards.
Bacteria, Yeasts and Moulds—Conn.

HOUSEHOLD MANAGEMENT.

Cost of Food—Richards.
Cost of Living—Richards.
Cost of Shelter—Richards.

COOKING.

First Lesson in Food and Diet—Richards.
Food and its Functions—Knight.
Food and the Principles of Dietetics—Hutchinson.
Foods and their Adulteration—Niley.
Milk and its Products—Ning.
Boston Cook Book—Lincoln.
Boston Cooking School Cook Book—Barrows and Lincoln.
Hostess of To-day—Larned.
Salads, Sandwiches, and Chafing Dish Dainties—Hill.
Paper Bag Cookery—Soyer.
New Cook Book—Rorer.

HOUSEHOLD DESIGN AND DECORATION.

Art and Economy in Home Decoration—Priestman.
Care of a House—Clark.
Healthful Farmhouse—Dodd
Homes and their Decoration—French.
Principles of Home Decoration—Wheeler.
Craftsman.
Good Housekeeping.
The House Beautiful.

FARMERS' BULLETINS.

United States Department of Agriculture.

No. 73. Cooking Vegetables.
No. 684. Potatoes as Food.
No. 244. Cooking Quality of Potatoes.
No. 316. Cooking Cereal Foods.
No. 29. Souring of Milk.
No. 42. Facts about Milk.
No. 365. Use of Milk as Food.
No. 87. Food Value of Eggs.
No. 103. Preserving Eggs.

FARMERS' BULLETINS—continued.

No. 190. Cost of Eggs in Winter.
No. 26. Federal Meat Inspection Science.
No. 34. Composition and Cooking of Meat.
No. 85. Fish as Food.
No. 162. Cooking Meat.
No. 186. Keeping Quality of Butter.
No. 241. Butter Making on the Farm.
No. 305. Gluten Flours.
No. 112. Bread and Bread Making.
No. 389. Bread and Bread Making.