MAJOR W. A. MERCER, 11th Cavalry
Superintendent

JOHN R. WISE
Assistant Superintendent

A. KENSLER
Quartermaster

File Oct. 26/07 to Carlisle File 811

DEPARTMENT OF THE INTERIOR
UNITED STATES INDIAN SERVICE
INDIAN INDUSTRIAL SCHOOL
CARLISLE, PA.

Subject:

October 10, 1907.

Outline Course of Agriculture.

To the Honorable,

The Commissioner of Indian Affairs,

Washington, D.C.

Sir:-

I enclose herewith outline of course in Agriculture, together with a letter of transmittal submitting the same.

The course in Agriculture has been prepared by Mr, John Whitwell, principal teacher, and Mr. Hugh W.Taylor, teacher of agriculture, in this school, in compliance with my wishes and in an attempt to better meet the desires and views of your Office as to a course along the line of Agriculture. I am very well satisfied with the results of their labors, and think it can be used with excellent effect, and I now submit it for your information and,if it meets with your approval,the official endorsement of your Office, so that we will feel we are on perfectly safe ground in using the course.

I invite your attention to the statement of Mr. Whitwell that photographs of actual work in the class rooms, and students at work in school gardens, will later be incorporated.

The course is printed in our school printery, and there will, therefore, be practically no expense for the pamphlets.

Very respectfully,

W. A. Mercer

Major 11th Cavalry,
Superintendent.

WAM/EFW

2 Encs.

6

MAJOR W. A. MERCER, 11th Cavalry
Superintendent

JOHN R. WISE
Assistant Superintendent

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Quartermaster

DEPARTMENT OF THE INTERIOR

UNITED STATES INDIAN SERVICE

INDIAN INDUSTRIAL SCHOOL

CARLISLE, PA.

J. WHITWELL
PRINCIPAL TEACHER

October 8, 1907.

Major W.A.Mercer 11th Cavalry,

Superintendent.

Dear Major:

I enclose a copy of the Course outlined in Agriculture for this school. The course is outlined to meet the requirements of the Indian Office along this line. and will I am sure materially assist you in your efforts to make class room work more practical.

My experience with courses in Agriculture has proved to me that above every thing else, the course should be planned to meet the special needs of the pupil. Too often the course is planned to look well on paper and its merits consequently end there.

The higher classes are already using the Course, and as soon as the opportunity affords, it will be put into effect in all other grades.

Very respectfully,

John Whitwell

Principal Teacher.

P.S.--If the course meets your approval I respectfully suggest that a copy be forwarded to the Superintendent of Indian Schools. Photographs of actual work done in the class room and of students at work in school gardens will later be incorporated.

REFER IN REPLY TO THE FOLLOWING:

DEPARTMENT OF THE INTERIOR,

OFFICE OF INDIAN AFFAIRS,

WASHINGTON.

Education
82235 - 1907
File 811

Subject:

October 26, 1907.

Course in
Agriculture.

Superintendent,
Indian Industrial School,
Carlisle, Pennsylvania.

Sir :

Answering your letter of the 10th instant, asking approval of the Outline of Course in Agriculture prepared by your Principal Teacher, Mr. John Whitwell, and Teacher of Agriculture, Mr. Hugh W. Taylor, you are advised that the Course is approved tentatively.

Very respectfully,

(Signed) C. F. Larrabee.
Acting Commissioner.

J.H.D.(P)

Compared.

Outline of Course in Agriculture, Indian Industrial School, Carlisle, Pa., 1907

Equipment

Connected with the school are two farms of 285 acres which are adapted to the cultivation of farm crops, vegetables, fruits etc. One adjacent to the campus, is annually planted to garden vegetables, potatoes forage crops, etc. On it is, also, a young orchard of peaches pear, cherry and apple with brush and bramble fruits included. The other farm is used for farm crops proper. Corn, wheat, timothy, clover, alfalfa, oats and millet are grown as required by the rotations practiced. All work is performed by student labor.

A dairy of about 90 cows furnishes milk for the school and is used for practical demonstration work. It is equipped with a Sharples' Tubular Separator, Box churn operated by a gasoline engine, Babcock Test, silo, feed cutter, etc. The herd contains good indi-

vidual cows of the Jersey, Guernsey, Holstein-Fresian and Durham breeds and a fine registered Jersey bull, thus affording excellent means for the study of breeds and stock judging.

A piggery, 120 feet in length, well lighted, ventilated and provided with sanitary equipments, is in use. Pens are provided for breeding purposes, brood sows and for fattening hogs affording excellent opportunity to study breeding, care and management of swine.

The poultry department is equipped with three hen houses provided with scratching floors, nests, etc., and a brooder house with incubator room and three incubators. All equipment is new and of the latest plan and type. The flock at present consists of 1 200 birds.

The school is provided with a greenhouse in which are grown plants for beautifying the campus and in which the students have an excellent opportunity to study plant propagation. All work in the dairy, piggery, poultry-yard and greenhouse is performed by the students directed by the employee in charge.

Steps have been taken to establish a museum in which specimens of agricultural products, including farm crops, garden crops, wool from the different breeds of sheep, insects, both beneficial and injurious showing life history will be exhibited. Samples of different commercial fertilizers, grains, seeds, feeds, etc., will

also be given space. Ears of corn, heads of wheat, etc., showing desirable and undesirable types will be given special prominence. Samples of the products of different reservations will be obtained.

PURPOSE—The purpose of the course is to create a desire for knowledge at first hand, to inspire self confidence and to instill in the Indian mind the immense and practical importance of agricultural pursuits. By use of simple experiments in the class room and laboratory, by frequent visits to farm, garden, dairy, poultry yard, and greenhouse, as well as by actual work done in these departments, it is hoped that the course will prove helpful, practical and beneficial to teacher and pupil alike. The special needs of the Indian on the different reservations have also been provided for.

First Grade

GEOGRAPHY—Simple talks about winds, clouds, storms, changes in the weather, frost, snow, ice, crops, fruits, grains.

BOTANY—Study of plants and nuts in season when practicable. Recognition of common plants and trees by their foliage. The effect of the season on buds, leaves, blossoms; note change in color of leaves before falling. Germination of seeds, bean, pea, corn—tracing in an elementary way their life history.

LANGUAGE—Simple descriptions of animals, trees, etc., on the farm.

Second Grade

GEOGRAPHY—Daily weather records, sleet, formation of snow, evaporation, etc., continued from first grade.

LANGUAGE—Talks on months, seasons, pine tree, maples, walnut, etc.

BOTANY—Germination of garden seeds including depth of planting, as shown in experiment No. 4. "Nature Study and Gardening." Dissemination of seeds, the trees preparation for winter, protection of buds, etc.

ANIMAL LIFE—Fuller descriptions of farm animals including fowls.

Third Grade

GEOGRAPHY—Individual weather records; school grounds showing trees and flower beds; draw plan of school farm; talk about the size, boundaries, kinds of soil and products of the farm. In a general way the adaptation of the farm for certain crops. Compare the climate and products of the different reservations to those of the vicinity of Carlisle.

BOTANY—More work in the germination of seeds. The relation of moisture and heat to germination as

showing by experiments No. 2 and No. 3, "Nature Study and Gardening". Name and recognize all autumn fruits, their likeness and differences. Study garden vegetables, especially those grown in students' gardens. Study also simple methods of cooking same as found in Teaching the Rudiments of Cooking in the Class Room." Differences in elm, apple, peach, pine, etc.

LANGUAGE—Simple oral and written descriptions of trees growing on Campus and school farm, using pictures to illustrate. Note kinds of soil where each is found. Refer to pine lands of the Ottawas and Chippawas of Michigan, etc.

ANIMAL LIFE—A study of different breeds of poultry and their value.

Fourth Grade

GEOGRAPHY—Locate the corn belt, wheat region, fruit zones of the United States, noting especially those of the different reservations. Note the region producing live stock and the influences governing these limitations of production, more especially in regard to the different reservations using outline map to indicate each region. Use blackboard copies of Doc. No. 5, Vol. 2, pt. 1, 59-1 indicating thereon (1) The mean temperature of the different reservations, approximate. (2) The different farm and garden products. (3) The

different kinds of soil. (4) The relation of soil and climate to production. Simple talks on the different kinds of soils, illustrated by experiment No. 5. Nature Study and Gardening."

ENGLISH—Selections from Agricultural books and other literature in the library relating to Agriculture.

BOTANY—Botanical structure of plants, noting root, stem, branch, leaf, flower, etc. Forming seeds, structure of seeds, relation of water to germination of seeds and growth of plant.

ANIMAL LIFE—Simple descriptions of the insects of the orchard. Different breeds of horses and cattle and their adaptation to the different reservations.

DAIRYING—Milk, products of milk. Simple discussions.

LANGUAGE—Suggestions for compositions; The Orchard, Indian corn, What my Reservation Produces, Gardening, Milk, The Jersey Cow, etc.

Fifth Grade

ARITHMETIC—See Suggestions and Practical Questions for fifth grade.

ENGLISH—Selections from Agricultural literature in library relating to the following subjects: Agriculture, Relations of Heat to Plant Growth; Horti-

culture, Weeds, Leguminous Plants, Plant Diseases; Grasses, Potatoes, Root Crops, etc.

ENTOMOLOGY—Field Insects.

LIVE STOCK—Dairy Breeds. Different breeds of swine and sheep, adaptability of same to the different reservations.

LANGUAGE—Suggestions for compositions: The Sheep, The Canada Thistle, Alfalfa, Making a Hotbed, The Catalpa Trees, etc.

Sixth Grade

ARITHMETIC— Practical problems in mensuration of farm buildings, feed bins, space for farm animals, silo, figuring rations for farm animals, etc.

ENGLISH—Selections from Agricultural literature on following subjects: Formation of Soil, Ventilation of Buildings, Treatment of Animals, Care of the Orchard, Care of Fowls etc.

ENTOMOLOGY—Benificial Insects and Bees.

LIVE STOCK—Different breeds of poultry. Value as food, Egg production. Adaptability to the different reservations.

LANGUAGE—Suggestions for compositions: A Poultry Yard. The Incubator, Brooders, My Favorite Fowl, Wild Fowls of My Reservation, The Turkey, Birds of Prey, etc.

Seventh Grade

1 Soils.

1 Defined.

2 How Soil is made.

1 Disintegration of rocks and minerals.

2 Decay of Animal and vegetable matter.

3 How Soil is transported.

1 By water.

2 By ice.

3 By wind.

4 Texture of soil.

1 Its importance.

2 Relation to

1 Soil moisture.

2 " heat.

3 Aeration.

3 How texture is modified.

5 Moisture.

1 Amount in soils.

2 Kinds.

1 Capillary.

2 Hydrostatic.

3 Hygroscopic.

3 How conserved.

1 By tillage.

2 By addition of Humus.

6 Tillage.

1 Importance.

2 Time.

3 Methods.

Soils—Continued.

6 Tillage—Continued.

4 Implements.

5 Effect on soil.

6 Destruction of weeds and insects.

7 Depletion of Soils.

1 By continued cropping.

2 Improper farm methods.

8 Enrichment.

1 By manures

1 Value of farm manures.

2 Classes of farm manure.

3 Methods of saving.

4 Methods of application.

5 Time to apply.

6 Amount to apply.

2 By commercial fertilizers.

1 Classes

1 Nitrogenous.

2 Phosphatic.

3 Potash.

2 Uses.

3 When to use.

4 How much to use.

5 When to apply.

6 Methods of application.

7 Home mixing.

3 By Rotation of crops.

1 Importance.

2 Kinds of rotations.

3 Length of rotation.

SOILS—Continued.

8 Enrichment—Continued.
3 By Rotation of Crops—Continued.
4 Objects.
1 Enrich the soil.
2 Destruction of weeds and insects.
5 Planning a rotation.
6 Diagram of farm and plan of individual rotation for each field.

9 Drainage.
1 Importance
2 Effect upon soil.
1 Induces capillary action.
2 Promotes aeration.
3 Manures and fertilizers more effective.
3 Kinds of drains
1 Open drain.
2 Under drain.
1 Location.
2 Depth.
3 Distance apart.
4 Kinds.
1 Box.
2 Stone.
3 Tile.

10 Irrigation.
1 History.
2 Importance.
3 When practiced

SOILS—Continued.

10 Irrigation—Continued.
4 When to irrigate.
5 Methods.
6 Source of water.
7 Amount of water.
8 Cost.
9 Management of soil.
10 Crops grown on irrigated soil.

Eighth Grade

I FORAGE CROPS.
1 Alfalfa.
1 Classification.
2 Structure.
3 Kinds of soil suitable for alfalfa.
4 Preparation of soil.
5 When to sow.
6 Selection of seed and quantity per acre.
7 Time for cutting.
8 Method of curing and handling.
9 Yield per acre.
10 Value as a feed; green, cured.
11 Effect on soil.
2 Same outline for Clover, Millet, Soy Bean, Cow Pea, Kaffir Corn, etc.

II STOCK FEEDING.
1 Composition of Animals.
1 Water.
2 Ash.
3 Protein.
4 Fat.

II Stock Feeding—Continued.
2 Composition of foods.
1 Water.
2 Ash.
3 Fat.
4 Protein.
5 Crude fiber.
6 Nitrogen free extract.
3 Digestibility of food stuffs.
1 Conditions affecting digestibility.
1 The food.
2 The Animal.
4 Nutritive Ratio.
1 How expressed.
2 Relation of food constituents.
3 Significance of the word ration.
5 Feeding Standards.
1 Defined
2 What standard to use.
3 Importance
4 How to figure a ration.

III The Fundamental Principles of Breeding
1 General characteristics of good animals.
2 Objects of breeding.
3 Factors influencing breeding
1 Heredity.
2 Atavism.
3 Law of Correlation.
4 Variation.
5 Relative influence of parents.
1 In transmitting good and bad characteristics.

IV Beef Breeds and Beef Production.
1 The Shorthorn.
1 History
2 General Characteristics.
1 Size.
2 Conformation.
3 Color.
4 Disposition
5 Maturity
6 Hardiness
7 Grazing and feeding qualities.
8 Quality of meat.
9 Milking qualities.
10 Adaptation to reservation.
2 Same outline for Herefords, Aberdeen Angus and Galloway.

V Dairy Breeds of Cattle.
1 The Jersey.
1 History.
2 General chracteristics.
1 Size.
2 Color.
3 Conformation.
4 Disposition.
5 Maturity.
6 Milking qualities.
7 Noted strains.
8 Selection of breeding animals.
9 Herd book.
2 Same outline for Guernsey, Holstein-Fresian Ayershire, Brown Swiss.

VI Swine Husbandry.

1 History.
2 Characteristics common to all breeds.
3 Characteristics of Breeds.
1 Poland China.
1 Origin.
2 Characteristics.
1 Size.
2 Form.
3 Color.
4 Conformation.
5 Maturity.
6 Adaptability to reservations.
7 Grazing and fattening qualities.
3 Selection of breeding animals.
2 Same outline for Berkshires, Chester Whites, Duroc Jerseys and Tamworths.

Ninth Grade

I Dairy Husbandry

1 The Dairy Barn.
1 Plan.
2 Ventilation.
3 Lighting.
4 Stalls.
5 Gutters.
6 Manure shed and well.

I Dairy Husbandry--Continued.

2 Review of feeding dairy cattle; as studied in seventh grade.
3 Milk.
1 Properties.
2 Composition.
1 Work with Babcock Test.
3 Care of milk.
1 Cleanliness
1 Of Stables
2 Of attendants.
3 Of vessels
2 Straining.
3 Cooling.
4 Uses of Milk:
1 For consumption as milk or cream.
1 Handling in cans or bottles.
2 Marketing.
2 For butter.
1 Creaming.
1 By gravity.
2 By Separator.
2 Churning.
1 Ripening of cream.
1 Relation of temperature to ripening.
2 Relation of bacteria to ripening.
2 Proper temperature for churning.

I Dairy Husbandry—Continued.

3 Milk—Continued.

3 Kinds of churns and separators.

3 Handling Butter.

1 Washing.
2 Working.
3 Salting.
4 Packing.
5 Marketing.

II Horticulture.

1 Propagation of plants.

1 By seeds.
2 ,, buds.
3 ,, layering.
4 ,, cuttings
5 ,, grafts.

Practical work with flowers, bush fruits, shrubs, peach and apple.

2 Preparing and managing hotbeds & cold frames.

1 Location.
2 Size.
3 Material.
4 Use.

3 Planning a garden and orchard.

1 Location.
2 Size.
3 Distribution of plants.
4 Preparation of soil.
5 Time to plant.
6 Methods of planting.
7 Culture.

II Horticulture—Continued.

3 Planning a garden and orchard.

8 Implements used.
9 Study of orchard fruits and garden vegetables in season.

III Landscape Gardening.

1 A careful study of the Carlisle grounds, and the campus of the other educational institutions of the city.
2 Original plans for an ideal home, and selection of shrubs, trees and planting of same.

IV Farm Buildings.

1 Locate the buildings on an ideal farm.
2 Make plans for same, including stables, dairy barn, silo, piggery, poultry house, etc., keeping in mind the following:

1 Size.
2 Convenience.
3 Economy.
4 Durability.
5 Sanitation.

A Farm Implements.

1 Kinds.

1 Plows.

1 Kinds.

1 Breaking.
2 Subsoiling.
3 Cultivating.

2 Harrows.

1 Kinds,

1 Disc.
2 Spring tooth.
3 Smoothing.

V Farm Implements—Continued.
1 Kinds—Continued.
3 Drills.
1 Kinds.
1 Corn planters.
2 Grain drills.
1 Disc.
2 Hoe.
3 Shoe.
4 Harvesting machinery.
1 Kinds.
1 Mowers.
2 Rakes.
3 Tedders.
4 Binders, etc.
2 Care of Implements.
1 Well repaired.
2 Carefully cleaned.
3 Well oiled where oil is required.
4 Well cleaned after using.
5 Property stored.

VI Insects and Fungi.
1 Comparison of chewing and sucking insects.
2 Study of common insects as Cabbage Worm, Coddling Moth, Potato Beetle, Cucumber Beetle; Squash Bug, Chinch bug, etc., noting parts of anatomy and stages in life history.
3 Fungi.
1 Illustrations.
1 Apple Scab.

VI Insects and Fungi—Continued.
3 Fungi—Continued.
1 Illustrations—Continued.
2 Potato Blight.
3 Grape Rot.
4 Anthracuose.
5 Crown Gall.
2 Fungi explained.
1 Life History.
2 Parasitic nature.
3 Injury.
4 Study of insecticides and fungicides.
1 Lime-Sulphur Solution.
1 Formula.
2 How prepared.
3 How applied.
4 When to apply.
5 Effect on insect and tree.
2 Same outline for Kerosene Emulsion, Paris Green, Arsenate of Lead, Bordeaux Mixture, etc.

Tenth Grade

I Plant Production.
1 The plant.
1 Structure—Study of some common weed or flower, noting the various parts and their functions.
2 Physiology.
1 How plants grow. Study of the functions of roots, stem, branches, leaves, flowers,

I PLANT PRODUCTION—Continued.

1 The Plant—Continued.

2 Physiology—Continued.

2 How plants feed. Sources from which plants obtain their food and how taken up and assimilated.

3 How plants reproduce.

1 By seeds. Study methods of planting with reference to depth, moisture, heat, air, etc. Trace life history, from seed to seed.

2 By Bulbs.

3 By Cuttings.

4 By Grafting.

5 By Budding.

2 The environment of the plant.

1 The Climate.

1 Light, heat, moisture, air. Their relation to plant life; both favorable and unfavorable conditions.

2 The soil.

1 Defined.

2 Origin and formation.

1 Early history of our globe.

2 Chief steps in soil formation.

3 Agencies active in soil formation.

I PLANT PRODUCTION—Continued.

2 The environment of the plant—Continued.

2 Origin and formation—Continued.

1 Mechanical.

1 Changes in temperature.

2 Gravity.

3 Water in moving ice.

5 Action of wind.

2 Chemical.

1 Air.

2 Water.

3 Air and water working together.

4 Weathering.

3 Plants and Animals.

3 Kinds of material found in soils.

1 Organic.

1 Animal.

2 Vegetable.

2 Inorganic.

1 Rocks.

2 Minerals.

4 Components of soils.

1 Sand.

2 Clay.

3 Silt.

4 Humus.

5 Classification of soils.

1 According to formation.

1 Sedentary.

1 Plant Production—Continued.
2 The environment of the plant—Continued.
5 Classification of soils—Continued
2 Transported.
1 Colluvial.
2 Alluvial.
3 Aeolian.
4 Drift.
2 According to Agricultural purpose
1 Sandy.
2 Clay.
3 Loam.
4 Humus.
5 Marsh.
6 Calcareous.
7 Alkali.
6 Properties.
1 Physical.
1 Specific Gravity.
2 Color.
3 Structure.
4 Texture.
5 Relation of soil to water.
6 ,, ,, ,, ,, heat.
7 ,, ,, ,, ,, air.
8 Capacity of soil to hold dissolved solids.
2 Chemical.
1 Nitrogen.
2 Phosphoric acid.
3 Potash.
4 Other elements discussed.

1 Plant Production—Continued.
2 The environment of the plant—Continued.
7 Management.
1 Tillage.
1 Importance.
2 Mechanical effect on soil.
3 Chemical effect on the soil.
4 Conservation of moisture.
5 Promote aeration.
6 Destroy weeds and insects
7 Proper time to cultivate.
8 Implements used.
2 Impoverishment.
1 By continued cropping.
2 By improper farm methods.
3 Enrichment.
1 Rotation of crops. Careful consideration.
2 Manures.
1 Classification.
2 Adaptability.
3 Sources.
4 Composition.
5 Methods of saving.
6 When to apply.
7 Methods of application.
3 Commercial Fertilizers.
1 Kinds.
2 Sources.
3 Composition.

I PLANT PRODUCTION—Continued.
2 The environment of the plant—Continued.
7 Commercial fertilizers—Contd.
4 Formula. How to interpret.
5 When to use.
6 How to apply.
7 Amount.
4 Drainage.
1 Importance.
2 Effect upon the soil.
3 Kinds.
1 Open drains.
2 Under drains.
1 Location.
2 Kinds.
1 Box.
2 Stone.
3 Tile.
5 Irrigation.
1 Definition.
2 History.
3 Importance.
4 When practiced.
5 Kinds of water available.
6 Methods of obtaining water.
7 Methods of application.
8 Amount of water used.
9 Cost.
10 When to irrigate.
11 Management of land.

I PLANT PRODUCTION—Continued.
3 Farm crops.
1 Classification.
1 Botanical, grasses, cereals, legumes, tubers, etc.
2 As to use, Forage crops, field crops, garden crops, etc.
1 Crops suited for mowing and pasture.
1 Perennial grasses.
2 Perennial Clovers and Alfalfa.
2 Crops suited for soiling and ensilage.
1 Millet.
2 Indian corn,
3 Sorghum.
4 Legumes.
3 Crops cultivated for their seed.
1 Cereal grains.
1 Wheat.
2 Oats.
3 Rye.
4 Indian corn, etc.
2 Legumes.
1 Beans.
2 Peas.
3 Clover and Alfalfa.
4 Crops cultivated for their under ground parts.
1 Root crops.
1 Beets.

I Plant Production—Continued.
4 Underground crops—Continued
2 Tubers.
1 Potatoes.
2 Culture of each crop to be studied as follows; preparation of soil selection of seed,—planting, cultivating harvesting, marketing, etc.
4 Fruits. Selection of suitable location for an orchard, preparation of the soil, methods of planting trees, culture, pruning, combatting overhard pests, etc. to be discussed, heading varieties of different fruits recommended for planting to be considered.
II Animal Husbandry.
1 Breeds of Domestic Animals.
1 Horses.
1 Draft.
2 Trotting.
3 Roadsters.
2 Cattle.
1 Dairy.
2 Beef.
3 Dual Purpose.
3 Sheep.
1 Wool.
2 Mutton.
3 Dual Purpose.

II Animal Husbandry—Continued.
2 Breeds of domestic animals—Continued.
4 Swine.
1 Large Breeds.
2 Middle Breeds.
2 General Principles of Stock Buding.
1 Heredity.
1 Of normal characteristics.
2 Of acquired characterstics.
3 Of diseases.
4 Atavism.
2 Law of Correlation.
3 Variation.
4 In-Breeding.
5 Cross-Breeding.
6 Influence of Parents.
7 Selection of Individual Animals.
3 Principles and Practice of Feeding.
1 Composition of the Animal body.
2 Composition of foods.
1 Function of nutrients.
1 Protein.
2 Carbohydrates and Fat.
3 Digestibility of food stuffs.
1 As affected by the Animal.
2 As affected by the condition of food.
4 Feeding Standards.
1 What a feeding standard is.
2 What standard should be used.
3 Computing a ration.

II Animal Husbandry—Continued.
3 Digestibility of food stuffs—Continued.
5 Feeds.
1 Hay.
2 Silage.
3 Grain.
4 By-products.
4 Dairy Husbandry.
1 The dairy cow.
1 Detailed study of the dairy type.
2 Feed, care and management.
2 Milk.
1 Nature and composition.
1 Character of solid constituents of milk.
2 Condition of animal exerting influence on the quality of milk.
3 Methods of determining composition.
1 The Babcock Test.
1 Carrying out the test.
4 Care of milk.
1 Cleanliness.
1 Stables.
2 Cows.
3 Attendants.
4 Vessels.
2 Straining.
3 Separating.
4 Cooling.

II Animal Husbandry—Continued.
4 Dairy husbandry—Continued.
5 Care of cream.
1 Ripening.
2 Temperature.
3 Churning.
6 Care of Butter.
1 Washing
2 Working.
3 Salting
4 Packing.

Compiled and arranged by Mr. John Whitwell, principal teacher, and Mr. Hugh W. Taylor, teacher of agriculture, and printed by Indian apprentices at the United States Indian Industrial School, Carlisle, Pa.