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UNIVERSITY OF MISSOURI.*

VOL. IV.

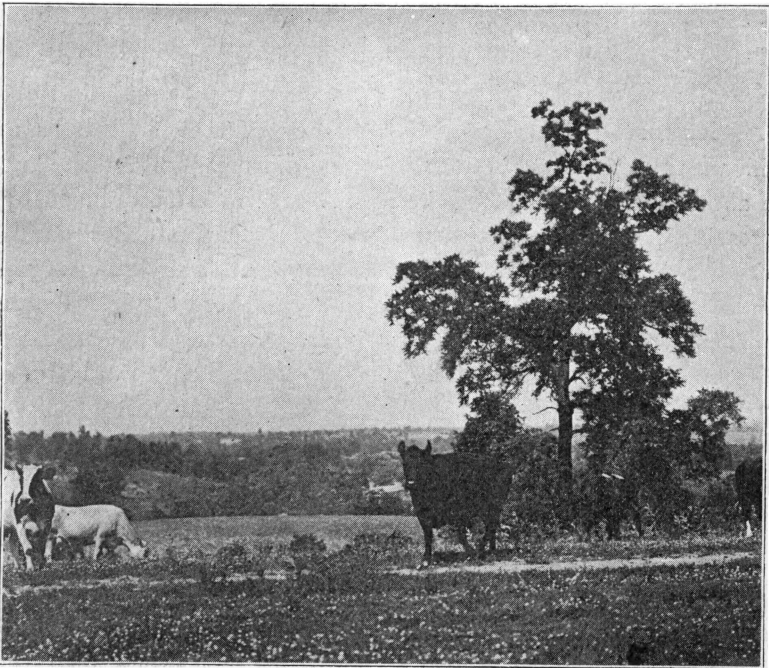
OCTOBER, 1903.

NO. 10

COLLEGE OF AGRICULTURE.

SHORT WINTER COURSES

IN



VIEW ON COLLEGE FARM.

AGRICULTURE, DAIRYING, AND ANIMAL
HUSBANDRY.

COURSES BEGIN JANUARY 5, 1904.

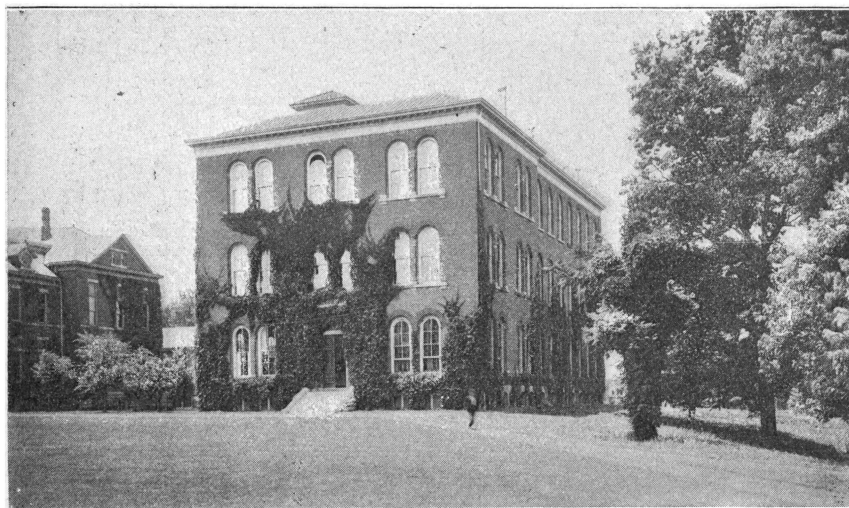
UNIVERSITY OF MISSOURI COLLEGE OF AGRICULTURE

COURSES IN AGRICULTURE.

In addition to a four years' course of study embracing the essentials of Agriculture, Horticulture, Animal Husbandry and Dairying, the College of Agriculture offers four distinct courses of study, beginning January 5, 1904.

1. An eight weeks' course in Agriculture (Plant Production).
2. An eight weeks' course in Animal Husbandry.
3. An eight weeks' course in Dairying.
4. A Summer School course for teachers.

Agricultural Education.—No tendency of recent times is more significant than the general demand among farmers for definite knowledge about the operations of the farm. It is well recognized by all progressive persons that success in farming as in other vocations comes as a result of clear, definite, knowledge. This knowledge, the result of many careful experiments, and the best experience of the most successful farmers, is acquired more easily and at less expense in an agricultural college than by long experience on a farm.



AGRICULTURAL HALL.

Students report here first for enrollment in all courses.

History.—The Missouri Agricultural College has successfully maintained courses of practical instruction for farmers, stockmen, dairymen, gardeners, and fruit growers, for ten years. The attendance has grown steadily and the facilities for instruction have been rapidly improved. Twenty-two specialists now offer to our students the best knowledge in every branch of farming, gardening, dairying, and stock growing. Now, especially, are the farmers of Missouri to be congratulated on the outlook for their college at Columbia. No other year in the history of the College has seen so many improvements as the present one.

Recent Improvements.—During the past year more than \$100,000 has been expended in the College of Agriculture for new buildings and equipment. During the coming year we shall erect a fine new sheep barn, a cattle-feeding shed 300 feet long by 30 feet wide, a \$10,000 cattle barn, and we shall expend \$5,000 for breeds of improved live stock. More than \$10,000 additional is available for the better equipment of the Horticultural, Live Stock, Veterinary, and Dairy Laboratories.



HOUSE OF THE DEAN OF THE AGRICULTURAL COLLEGE.

What the Short Winter Courses Aim to Do.—Many young men desire to become better farmers, more skillful stockmen, stock judges, dairymen, or orchardists, but have not the time to take a four years' course of study. For these, the short courses are planned. The instruction is in everything practical, having in view especially the needs of men who must immediately turn to account the facts learned in the class room.

Methods.—In the short courses, much attention is devoted to laboratory instruction. The student learns by actual contact and original investigation. Practical exercises in identifying the varieties of farm crops, in judging animals, in propagating plants, and in budding, grafting, planting, and pruning orchards, and in making butter and cheese are the efficient means employed for illustrating and fixing in mind, the instruction given in the class room.

Expenses of the Course.—No charge is made for tuition. The only charge is an incidental fee of \$5. A small laboratory deposit is required to cover cost of material and breakage, in the laboratories. Good board and room, including fuel, light, furniture, care of rooms and table board can be secured in Columbia at from \$3.50 to \$4 a week. Those wishing to do so may rent such rooms in the University Clubs as may be vacant, at prices ranging from \$7 to \$12.50 each for the session of eight weeks. The charges for table board and washing usually amount to \$1.75 or \$2 a week. An initiation fee of \$1 is also required by the club, for wear of dining room equipment. The entire expense for any one course, excluding cost of travel, need not exceed \$50. Many students expend not over \$40 during the term.

Admission.—No examinations are required for entrance to these short courses. Any person over sixteen years of age may enroll and enjoy the full privileges of the instruction. Many students have taken these courses to become better acquainted with the work of the Agricultural College and have later entered the long course.

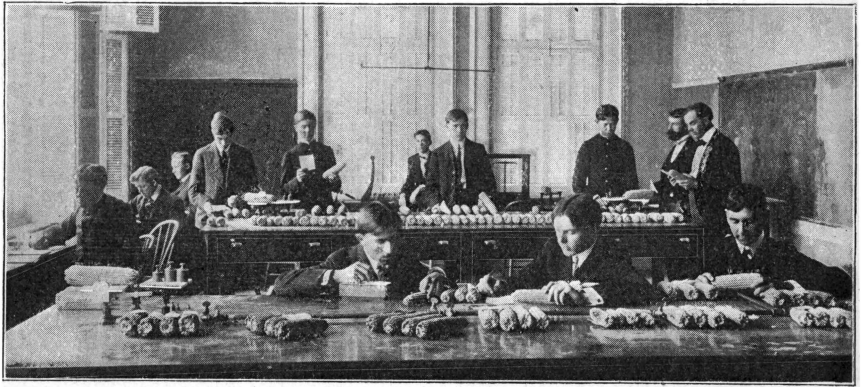
Managers Wanted.—Each year the College has numerous requests for young men properly trained to take charge of stock farms, dairies, creameries, and orchard plantings. Thus far the supply of men with the proper training has not been equal to the demand.

OUTLINE OF COURSES.

(A) Course in Agriculture (Plant Production).

I. **Farm Equipment.**—Uses and values of construction material for farm buildings. Plans for general barns. Special horse, cattle, and sheep barns, swine pens, and poultry houses. Demonstration of various mechanical problems of farm machinery, including the principles of draft. Dr. Tucker.

II. Soils.—The origin, formation, and distribution of soils. Their chemical and physical properties as related to fertility. Classification of soils with relation to the ways in which they are affected by water, air, and heat. Dr. Tucker.



LABORATORY FOR AGRONOMY—STUDENTS JUDGING CORN.

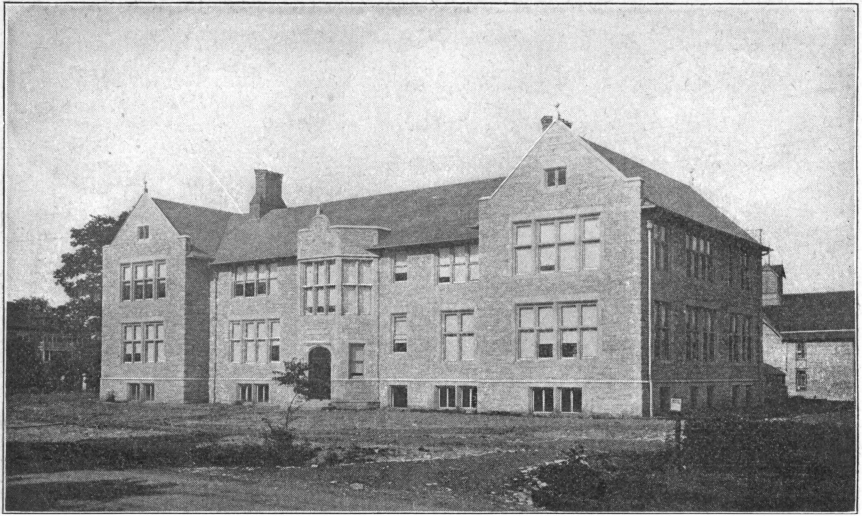
III. Fertilizers and Manures.—The best method of preserving and applying farmyard manures; the relative values of different manures and fertilizers; the use and application of commercial fertilizers, lime, and plaster; the manurial value of crops, and the methods of using them to maintain soil fertility. Dr. Tucker.

IV. Farm Crops.—Conditions of germination and plant growth; special requirements of the different farm crops; rotation, cultivation, harvesting, and storing of crops; best varieties of corn, wheat, etc., for Missouri; some discussion of promising new crops, especially fertilizing crops—cow peas, soy beans, alfalfa, etc. The College farm and experimental grounds comprise nearly 600 acres of well improved land on which many experiments illustrating various methods of farm management are made. Dr. Tucker.

V. Horticulture. By Professor Whitten, Mr. Howard and Mr. Favor.

Propagation of fruit trees, vines, and berry plants by means of grafting, budding, layering, cuttings, seeds, etc., and what constitutes good stock for planting in the orchard or berry field.

Soil and Location of the fruit plantation, how to select the proper soil for fruits, the significance of the slopes and elevations, water and atmospheric drainage, proximity to markets, facilities for transportation, etc..



HORTICULTURAL HALL.

In this Building are Laboratories for Horticulture, Entomology
and Botany.

Planting fruit trees and berries, laying out the plantation, distance apart to set the plants, time and manner of planting, etc.

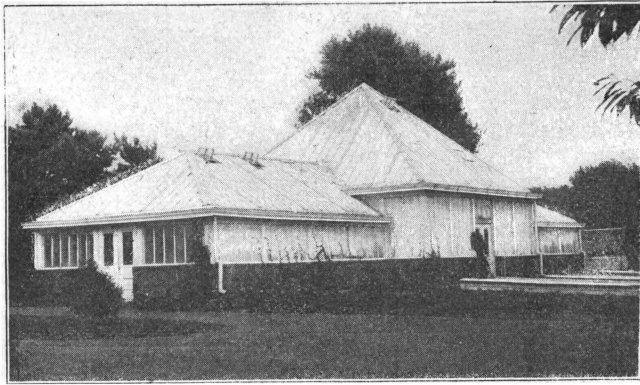
Tillage of fruit lands; preparation of the soil for planting; cultivation of orchards and berry plantations; crops that may be grown in an orchard; relation of mulching and soil management to the conservation of moisture, the ripening of the wood in autumn, fruitfulness and the general development of the trees.

Pruning fruit trees, vines, etc., at the time of setting in the plantation and throughout their subsequent development; season for pruning; relation of pruning to fruitfulness and to wood growth, climatic conditions, diseases, etc.

Fungous Diseases and their treatment; the various rots, rusts, blights, smuts, cankers, scabs, mildews, and other diseases, together with the methods of making and applying spraying mixtures for these maladies.

Picking, Packing, Storing, and Marketing different fruits.

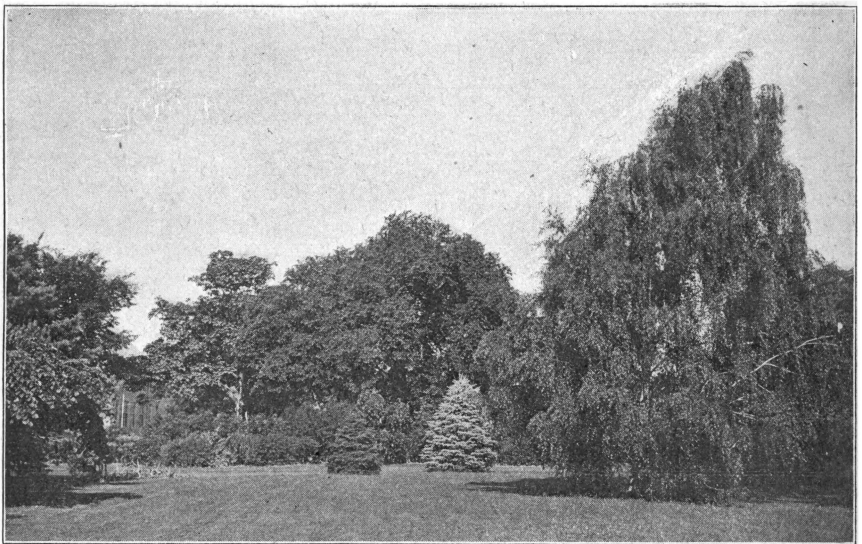
Varieties of different fruits for market and for home use and their adaptation to various soils and locations.



GREENHOUSE AND LABORATORY FOR PLANT PROPAGATION.

Vegetable Growing.—The planting, cultivation, and management of garden vegetables; construction, management and use of hot beds and cold frames; transplanting, etc.

Planting Home Grounds.—Laying out grounds; making drives and walks; planting, pruning and management of the more desirable shade trees, shrubs, etc.

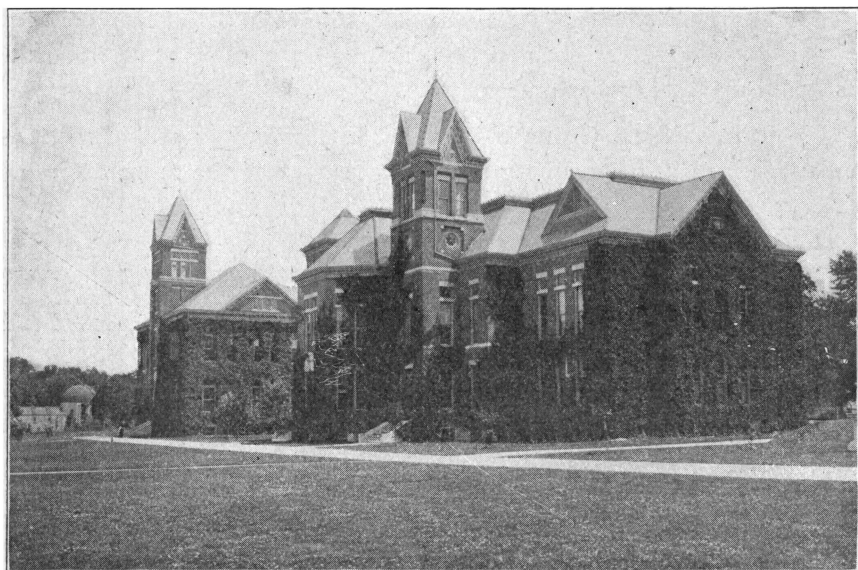


THE HORTICULTURAL GROUNDS—LOOKING WEST.

VI. Botany.—The structure of plants and the use of their different parts—roots, stems, leaves, and flowers; how plants gather their

food from earth and air; how they grow and reproduce their kind; how useful plants are modified and improved by selection; and how harmful ones, especially weeds, may be controlled and eradicated; different forms of seeds, how they are carried by winds, water, or animals, and the consequent spreading of both useful and noxious plants; pollination of flowers, and the uses of bright colors, scents, etc., in attracting bees and other pollen-carrying insects. Professor Duggar.

VII. Economic Entomology.—These lectures treat of the insects that are injurious to fruit, farm, and garden crops, and to farm animals; and describe the habits and life histories of such insects and the best methods of combating them. Professor Stedman.



LABORATORY FOR AGRICULTURAL CHEMISTRY.

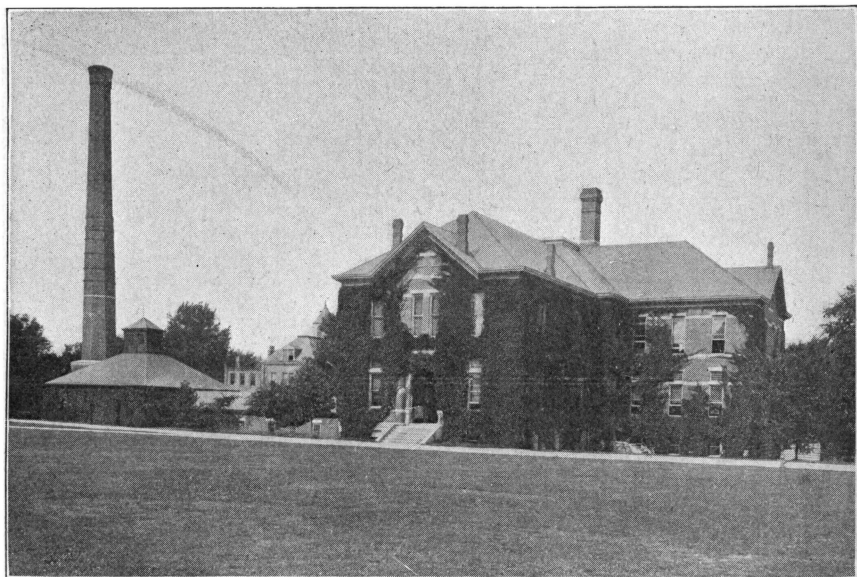
VIII. Agricultural Chemistry.—The chemical composition of soils, plants, and agricultural products; the chemistry of plant and animal nutrition. Dr. Schweitzer and Dr. Bird.

IX. Carpentry and Blacksmithing—Woodworking.—The shop courses are planned as nearly as possible to meet the needs of the agricultural student, and only the most practical work is attempted. In carpentry, much emphasis is placed on the care of tools and methods of keeping them in order. Projects, when practicable, have direct bearing on problems of the farm.

In forging, the problems of shaping, welding and tempering iron and steel, are worked out by the student.

Some work in pipe fitting is given as well as some practice in drilling, saw filing, etc.

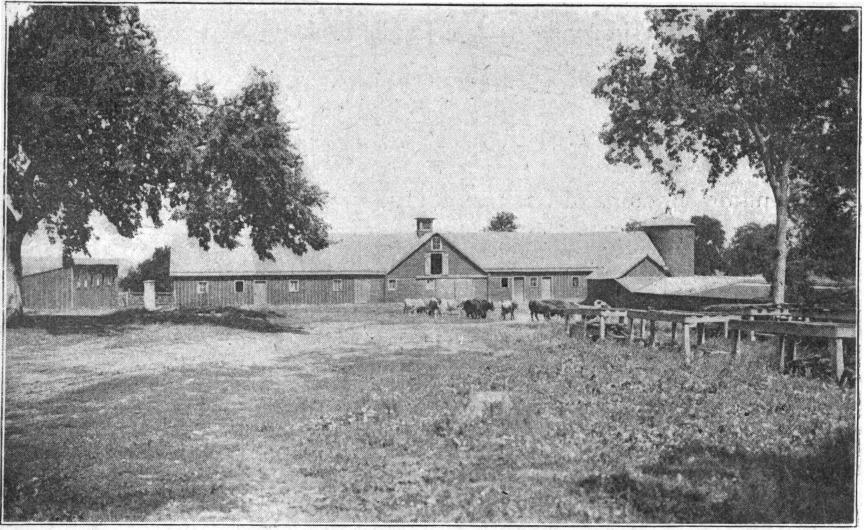
A model house and barn in course of construction furnish an opportunity for a study of methods of construction.



MECHANIC ARTS BUILDING AND POWER HOUSE.

(B) Course in Animal Husbandry.

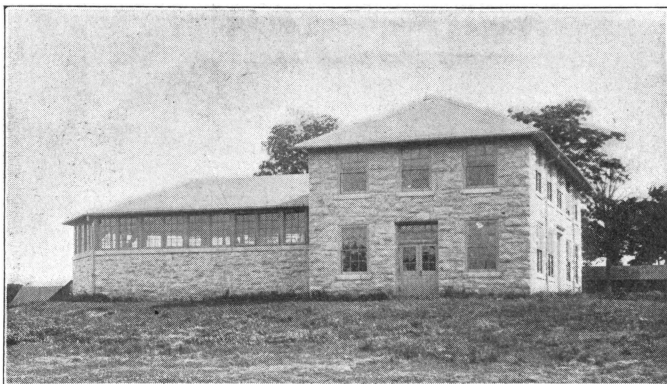
I. Stock Feeding.—The composition and digestibility of feeding stuffs; the preservation and preparation of coarse fodders; hay making; ensilage; grinding, steaming, and cooking food; feeding standards and the calculations of rations; growth and fattening; feeding for meat, milk, wool, etc.; effect of food upon quality of meat, wool, milk, and butter. There is practice in computing and compounding rations for various purposes. Assistant Professor Forbes.



AGRICULTURAL COLLEGE BARN AND SILO.

II. Forage Crops.—The production and utilization of the most important forage crops for the stock farm. This course will include the subject of silage and silo building as related to conditions in Missouri. Professor Mumford.

III. Stock Breeding.—The principles of breeding, heredity, variation and selection. The methods of breeding, grading, in-breeding, cross-breeding, pure breeding, and line breeding. Special problems such as the influence of environment, of fecundity, influence of a previous impregnation; the possibility of controlling the sex of offspring, etc., are considered in their relations to the operations of the stock breeder. Professor Mumford.



LIVE STOCK LABORATORY AND JUDGING PAVILION.
All Courses in Stock Judging are given in the Judging Pavilion.

IV. Breeds of Live Stock.—A study of the history and development of the leading breeds of cattle, horses, sheep, and swine. These lectures are supplemented by a careful study of typical animals now on the farm. This course embraces also a study of pedigrees. The Department of Animal Husbandry is equipped with complete sets of the record books of all the important live stock associations of America. Assistant Professor Forbes.



STUDENTS JUDGING CATTLE.

V. Stock Judging.—Practical work at the barns in judging cattle, horses, sheep, and swine. A carefully prepared score card is used to develop the student's powers of observation and to fix in his mind the best types. The farm is now supplied with choice animals of the Shorthorn, Aberdeen Angus, and Hereford breeds, representing the best beef types, and with well selected herds of Jerseys, Holsteins of typical dairy forms. Representative specimens of Shropshire, Hampshire, and Delaine Merino sheep supply material for thorough work in judging breeds of sheep. Eighty head of high class feeding cattle are used in these exercises.. Excursions are made to successful cattle feeding and breeding establishments and to noted stock farms. Assistant Professor Forbes and Mr. Harper.

VI. Veterinary Science.—The aim of this course is to enable the students to prevent in a large measure those diseases of animals,

that result from improper feeding and handling, and from lack of proper sanitary conditions. Students are taught also to treat in a rational way simple internal ailments, and to perform with some skill easy surgical operations.

The following outline shows the subjects considered: The elementary anatomy and physiology and hygiene of domestic animals; examination for soundness; determination of age; common diseases of the internal organs, such as colic, indigestion, constipation, diarrhoea, inflammation of lungs and trachea, retention of urine, inflammation of udder, etc.; surgical diseases, like sprains, spavin, curbs, nail pricks in foot, barbwire cuts, fistula, bad teeth, etc.; instruction in castration, spaying, and caponizing; contagious infections and parasitic diseases, such as strangles, glanders, black-leg, tuberculosis, anthrax, hog cholera, stomach and intestinal parasites, trichina, lung worms, scabs, lice, etc.

The lectures are illustrated by charts, models, and preserved specimens of diseased tissue. Dr. Connaway and Dr. Foster.



VETERINARY CLINIC.

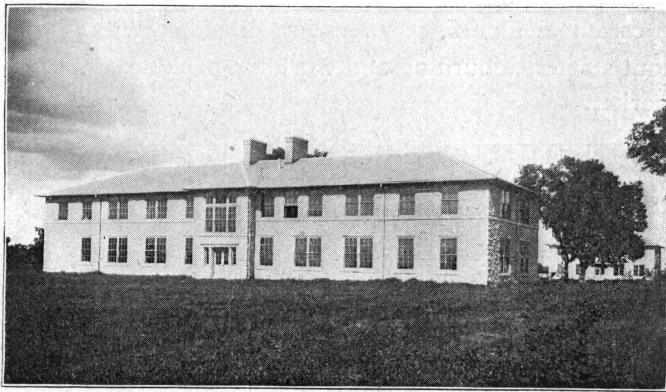
VII. Veterinary Clinics.—Each Saturday afternoon surgical operations are performed and diseased animals are treated before the whole class. Simple operations are often performed by the students themselves. Dr. Connaway and Dr. Foster.

VII. Carpentry and Blacksmithing.—See page 8.

(C) Course in Dairying.

In no division of Agriculture does success depend more upon intelligence and skill than in dairying. Combined with high quality must always be economy in cost of production. The dairyman or factory operator must familiarize himself with improved methods and with modern machinery.

Equipment.—Our Dairy Laboratory is a two-story stone structure, 143 feet long by 43 feet wide. The receiving room, creamery, cheese manufacturing room, farm dairy, pasteurizing room, store room, and refrigerator, are on the first floor. The cheese curing room is in the basement. The library, office, lecture room, milk testing laboratory, and laboratory of dairy bacteriology are on the second floor.



NEW STONE DAIRY BUILDING.

The creamery room 40 by 40 feet contains receiving vats, milk heater, belt and turbine separators, cream vats, two combined churns and workers, cream pasteurizers, and other apparatus used in a modern creamery. Milk and cream are received each day from farmers

and all the usual operations of separating and making butter are carried on by the students.

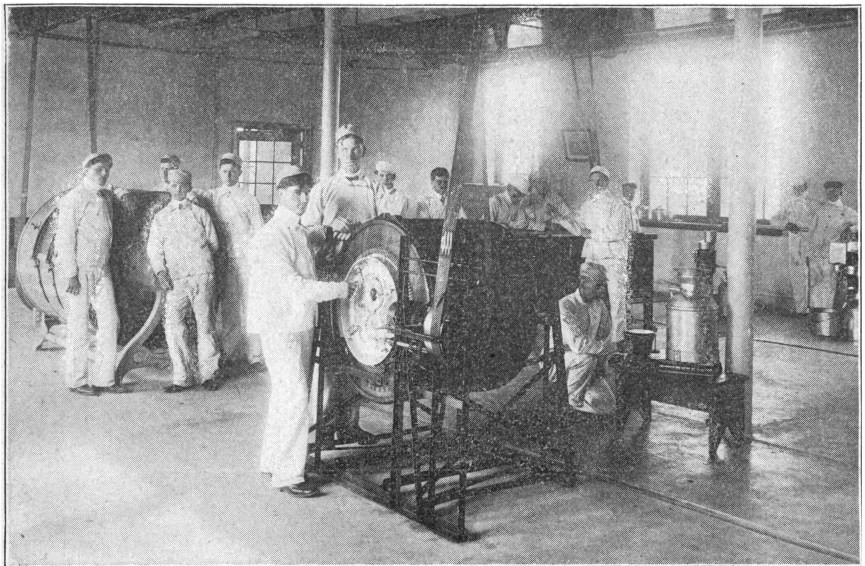
The farm dairy room contains eight farm size separators, small churns of various kinds, and other apparatus used in a model home dairy

The testing laboratory is supplied with eight Babcock testers, both hand and turbine, and with testing apparatus of every kind used in dairy work.

The Dairy Herd.—The Agricultural College has an excellent dairy herd of over forty registered cows of the Jersey and Holstein breeds. The cows are used for judging and for studying different types of the dairy cow. Complete records are kept of the milk and butter production which give valuable material for class illustrations. The milk from these cows is part of the supply used at the dairy building.

OUTLINE OF WORK.

Dairy Practice.—In the forenoon all students attend lectures; in the afternoon all dairy students work in the dairy laboratories. They do all kinds of work necessary in a factory, such as weighing and sampling cream and milk, pasteurizing cream, ripening cream with and without starters, churning and working, packing and printing butter for market.



DAIRY LABORATORY.

Butter-making.—Lectures on the nature and composition of milk and dairy products; the theory of centrifugal separation and the construction of various separators; the principles of cream ripening, churning, and the preparation of butter for markets.

Milk Testing.—A thorough study of the Babcock test for milk, cream and cheese; the tests for acidity of cream; the use of the lactometer for detecting adulterations; making tests of individual cows.

Dairy Bacteriology.—This course consists of lectures with numerous experiments on the nature of bacteria, their distribution, the conditions necessary for their growth, the relation of various common kinds of bacteria to milk, the means by which milk becomes contaminated, and the relation of various fermentations to butter and cheese making. Starters and cream ripening are considered in detail.

Dairy Machinery.—Lectures on the care of boilers, economical firing, the construction and operation of pumps and engines, and the placing of machinery.

Feeding Dairy Cattle.—Special attention is given in this course to the principles of feeding for the most economical production. A study is made of the composition and use of various feeds and their adaptability for milk production.

Dairy Breeds and Selecting Dairy Cows.—Lectures are given on the common breeds of dairy cattle, their origin, characteristics, dairy qualities, and points of excellence.

In this work use is made of over forty registered Jerseys and Holsteins, whose records in milk and butter production have been kept for about ten years.

Farm Dairying.—Many students wish special training in milk production and butter and cheese making on the farm. For such, courses are given on selecting and feeding dairy cows, and on the production of crops for the dairy farm. These students attend the lectures on Dairying, work two half days in the Dairy Laboratory, testing milk and making butter. The remainder of the work may be elected from the courses in Animal Husbandry and in Agriculture.

Dairy Suits.—Each student will provide himself with at least two white cotton suits. These may be purchased in Columbia at one dollar per suit.

Other Courses in Dairying.—Instruction in dairying is given throughout the school year in the four years' course in Agriculture.

The Demand for Trained Men.—The demand for men who are well trained in dairy work is far from being filled at any time. During the past year the college has had many more applications for such men than it could supply. The demand is for men competent to take charge of creameries, cheese factories, and skimming stations, or to manage dairy farms or city milk supply companies, or as herdsmen to take charge of pure bred herds. Applications have been made to the college during the present year for men in all these lines. In view of the rapid development of dairying in Missouri, this demand should increase rather than decrease in the future. The college does not guarantee positions to its students, but it assists them to find situations suited to their training and ability.


All courses open promptly on Tuesday, January 5th, and continue for eight weeks. Information regarding these courses and others in the College of Agriculture, may be had by addressing the undersigned.

F. B. MUMFORD,
Acting Dean,
Columbia, Missouri.

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