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VOLUME III

NUMBER 13

NEW YORK STATE COLLEGE OF  
AGRICULTURE  
ANNOUNCEMENT OF THE SECOND  
SUMMER SCHOOL IN AGRICULTURE  
JULY 6-AUGUST 16  
1912

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This announcement is intended to give detailed information to prospective students in the Summer School in Agriculture at Cornell University.

For general information concerning the University and the work in its various colleges during the academic year, the requirements for admission, etc., the General Circular of Information should be consulted. This and the other Official Publications of Cornell University are listed on the last page of the cover of this pamphlet. Any one of the informational publications there mentioned will be sent gratis and post-free on application to the Registrar of Cornell University, Ithaca, N. Y.

## CALENDAR

### SUMMER SCHOOL IN AGRICULTURE 1912

In order to get the full number of exercises announced for the Summer School, it is necessary that all work begin promptly on Monday morning, July 8. Students are therefore urged to reach Ithaca in time to be present at the first exercise in each class. If possible, they should register on Saturday, July 6; if not, they should register on Monday during the hours not occupied in class work.

July 6, Saturday,	9 a.m. to 5 p.m. Registration first at office of Registrar, Morrill Hall, and then with the Secretary, College of Agriculture, Main Building, Room 122.
July 8, Monday,	Instruction begins at times and places announced under each course. Registration continued.
July 9, Tuesday evening, and following Tuesdays, Wednesday evenings,	Musical recital, Sage Chapel. The Director of the University Summer Session will make a brief address. Country-life addresses and assemblies of Summer School students as announced in weekly calendar.
July 11, Thursday evening, and following Thursdays,	Musical recital, Sage Chapel.
July 13, Saturday, before 1 p.m.	Last day for the payment of fees at the Treasurer's office, 1 Morrill Hall.
July 15, Monday evening,	First lecture in Monday evening course. Continued on following Mondays. Rockefeller Hall.
August 15, 16, Thursday and Friday,	New York State Examinations for Teachers' Certificates.
August 16, Friday,	Examination for entrance credit in Agriculture.
August 16, Friday,	Summer School closes.

A weekly calendar is published by the University. During the Summer School it will be mailed to any address on receipt of twenty-five cents at the Registrar's Office.

It is expected that a special training conference for rural leaders will be held at the College of Agriculture June 25 to July 5, inclusive. Information may be had on application to the Secretary, College of Agriculture.

## CALENDAR

### ACADEMIC YEAR 1912-13

September 13, Friday,	Entrance examinations begin.
September 23, Monday,	Academic year begins. Registration of new students. Scholarship examinations begin.
September 24, Tuesday,	Registration of new students.
September 25, Wednesday,	Registration of old students.
September 26, Thursday,	Instruction begins. President's annual address to the students.





## CORNELL UNIVERSITY SUMMER SCHOOL IN AGRICULTURE, 1912

### OFFICERS

Jacob Gould Schurman, LL.D., President of the University.  
Liberty Hyde Bailey, LL.D., Director of the College of Agriculture.  
David Fletcher Hoy, M.S., Registrar of the University.  
Albert Russell Mann, B.S.A., Secretary to the College of Agriculture.

### FACULTY

The members of the faculty are, except when the contrary is indicated, regular members of the Cornell University staff of instruction.

Henry Hiram Wing, M.S. in Agr., Professor of Animal Husbandry.  
John Lemuel Stone, B.Agr., Professor of Farm Practice.  
James Edward Rice, B.S.A., Professor of Poultry Husbandry.  
George Walter Cavanaugh, B.S., Professor of Chemistry in its Relations with Agriculture.  
Herbert Hice Whetzel, A.B., M.A., Professor of Plant Pathology.  
William Alonzo Stocking, jr., M.S.A., Professor of Dairy Industry.  
Charles Scoon Wilson, A.B., M.S.A., Professor of Pomology.  
Charles Henry Tuck, A.B., Professor of Extension Teaching.  
Wilford Murray Wilson, M.D., Professor of Meteorology.  
James George Needham, Ph.D., Professor of General Biology, Limnology, and Nature Study.  
Edward Gerrard Montgomery, M.A., Professor of Farm Crops.  
Flora Rose, B.S., M.A., Professor of Home Economics.  
Martha Van Rensselaer, A.B., Professor of Home Economics.  
William Albert Riley, Ph.D., Assistant Professor of Entomology.  
Merritt Wesley Harper, M.S., Assistant Professor of Animal Husbandry.  
Clarence Arthur Rogers, M.S.A., Assistant Professor of Poultry Husbandry.  
Glenn Washington Herrick, B.S.A., Assistant Professor of Economic Entomology.  
Howard Wait Riley, M.E., Assistant Professor of Farm Mechanics.  
Cyrus Richard Crosby, A.B., Assistant Professor of Entomological Investigations.  
Harold Ellis Ross, M.S.A., Assistant Professor of Dairy Industry.  
Elmer Seth Savage, M.S.A., Ph.D., Assistant Professor of Animal Husbandry.  
Lewis Knudson, B.S.A., Ph.D., Assistant Professor of Plant Physiology.  
Alvin Casey Beal, Ph.D., Assistant Professor of Floriculture.  
James Chester Bradley, Ph.D., Assistant Professor of Systematic Entomology.  
Kenneth Carter Livermore, B.S. in Agr., Assistant Professor of Farm Management.  
Vaughan MacCaughy, Professor of Botany, The College of Hawaii.

- Lewis Josephus Cross, B.A., Instructor in Agricultural Chemistry.  
Edward Sewall Guthrie, M.S. in Agr., Instructor and Investigator in Dairy Industry.  
Paul Work, B.S., A.B., Instructor and Investigator in Olericulture.  
Roy David Anthony, B.S. in Agr., Instructor in Pomology.  
Robert Matheson, M.S. in Agr., Ph.D., Instructor in Biology.  
George C. Embody, Ph.D., Instructor in Aquiculture.  
Harry Oliver Buckman, M.S.A., Instructor in Soil Technology.  
Earl Whitney Benjamin, B.S. in Agr., Instructor in Poultry Husbandry.  
Alice Gertrude McCloskey, A.B., Associate in Rural Education.  
Walter Warner Fisk, B.S. in Agr., Assistant in Dairy Industry.  
Thomas Joseph McInerney, B.S. in Agr., Assistant in Dairy Industry.  
Edward Mowbray Tuttle, B.S. in Agr., Assistant in Rural Education.  
Charles Paul Alexander, Assistant in Biology.  
Olney Brown Kent, Assistant in Poultry Husbandry.  
Millard Alschuler Klein, B.Sc., Assistant in Soil Technology.  
Katharine Row Moore, Preceptress, Penn Yan Academy.  
Cora Amelia Smith, A.B., Assistant in Nature Study.  
Charles Edward Hunn, Gardener.



## OBJECT AND SCOPE OF THE SUMMER SCHOOL IN AGRICULTURE

The primary object of the Summer School in Agriculture is to further agricultural education by aiding those engaged in it. The courses are arranged to meet the needs of the following classes:

- (1) Persons who desire to teach agriculture, including nature study, home economics, and entomology, or to pursue investigations in agriculture.
- (2) College students in Cornell or other universities who wish to use a part of the summer vacation for additional study or to make up deficiencies.
- (3) Students entering the University who desire to secure surplus credits at entrance or to secure credit in entrance agriculture.
- (4) All persons qualified to pursue any course given, whether or not they are engaged in study or in teaching. The courses will be serviceable for those who desire to put the training into immediate practical use on the farm, in the garden, or in the home.

To meet these several needs, the courses have been arranged in the following five groups:

**I. Agriculture.** In this group elementary instruction is offered in soils, animal husbandry, farm crops, economic entomology, poultry husbandry, vegetable gardening, meteorology, agricultural chemistry, dairying, farm management, plant diseases, pomology, farm mechanics, and floriculture. The instruction is adapted primarily for teachers, superintendents, and supervisors who desire to start in this field. Subjects in Agriculture required by the New York State Syllabus for Secondary Schools are covered in these courses.

**II. Agriculture.** In this group more advanced instruction is offered in agricultural chemistry, animal husbandry, farm crops, farm poultry, plant physiology, dairying, plant pathology, and soils, for college students and other persons desiring more extended training in one or more of these subjects. Subjects in this group and in the group preceding will be helpful to those who are already engaged in farming and who desire some special training.

**III. Nature Study and Elementary Agriculture.** General nature study, natural history methods, elementary agriculture, rural school education, school gardening, and textbook work in agriculture are included in this group. The work is intended primarily for teachers and superintendents, but is open to other qualified persons who desire a more intimate acquaintance with the out-of-doors. The courses cover the work in elementary agriculture and nature study as outlined in the New York State Syllabus.

**IV. Home Economics.** Courses in foods, human nutrition, home economics, household sanitation, and extension work are offered for teachers, college students, and housekeepers.

**V. Entomology.** In this group special instruction is offered in general entomology, morphology and classification of insects, aquatic insects, economic entomology, insects and diseases, photography and lantern-slide making, systematic entomology, and special investigations, for teachers, college students, and investigators.



The regular Summer Session of the University will be in session at the same time as the Summer School in Agriculture. Any of the courses in the University Summer Session may be elected by qualified students registered in the Summer School in Agriculture. For a course thus elected by residents of New York State, a fee of \$15 will be charged; for two or more courses, a fee of \$25 will be charged. Announcements of the University Summer Session may be had on application to The Registrar, Cornell University.

### ADMISSION, ATTENDANCE, REGISTRATION

There is no examination for admission to the Summer School in Agriculture. Each person, however, must satisfy the instructor in charge of any course that he is qualified to pursue the work of the course. Any duly registered student in the Summer School in Agriculture may visit other classes than those for which he is specifically registered.

All students are required to register first at the office of the University Registrar in Morrill Hall. They may register on Saturday, July 6, between 9 a.m. and 5 p.m., or on the day of their arrival if they reach Ithaca later than July 6. Registration on July 6 is urged. Class exercises begin at 8 a.m., Monday, July 8. The Registrar's office is open from 9 a.m. to 4 p.m. every day except Saturday, when it is closed at noon. Students will report at the office of the Secretary, College of Agriculture, Room 122, Main Building, immediately after registering with the Registrar of the University.

### TUITION FEE

Tuition in the Summer School in Agriculture is free to residents of New York State and to students registering in the Graduate School in Cornell University. Non-residents will be charged a tuition fee of \$25, whether one subject or more be taken. This must be paid at the office of the Treasurer, Room 1, Morrill Hall, within five days after registration day. Students who pay the fee of \$25 may take work in the University Summer Session without extra charge. In case of withdrawal, for reasons satisfactory to the Treasurer and to the Registrar, within five days from the first registration day, the tuition may be refunded and the charge canceled. In case of withdrawal within two weeks after the first registration day, one-half the tuition may be refunded. In case of registration after the first three weeks of the School, students must pay two-thirds of the full tuition fee.

### LABORATORY FEES

Fees to cover the cost of materials used will be charged in a few courses and are announced in connection with those courses. Fee cards must be procured at the first class-period in each of the courses concerned. The receipted fee cards must be returned to the instructor in charge of the course within five days after the beginning of the course.

### ACADEMIC CREDIT FOR WORK

Academic credit will be allowed for certain courses in agriculture, nature study, home economics, and entomology, as announced in connection with those courses. On the completion of the first agricultural group, one unit in entrance



agriculture will be given to those persons who pass an examination for that purpose at the close of the Summer School.

**In the College of Agriculture.** The requirements for the degree of Bachelor of Science in Agriculture are residence for eight terms (four years), and the completion of one hundred and twenty hours ("points") of elective work. A student who has satisfied the entrance requirements of the College and has afterward completed in two or more summer sessions, either in the Summer School in Agriculture or in the regular University Summer Session, at least twelve hours of work in courses approved by the departments concerned, may be regarded as having thus satisfied one term of residence. Work done in summer sessions shall be accepted as the equivalent of not more than two terms of residence. The maximum amount of credit toward the degree of Bachelor of Science in Agriculture that is allowed for the work of any one summer session is seven hours.

**Certificates for work.** Students in the Summer School who are not matriculated in the University may receive certificates of attendance and of work satisfactorily performed. Application for such certificate must be made before August 16, and the applicant must leave at the office of the University Registrar a large envelope stamped and bearing his home address. The certificate will then be forwarded by mail.

### COST OF LIVING

The cost of board and furnished room in Ithaca during the Summer School runs from \$5.50 a week upward. In some cases the cost has been reduced to \$5, or even \$4.50, but it is not safe to count on less than \$5.

The price of a single furnished room may be as low as \$1 a week. The prices advance with the size and location of the rooms.

Rooms are engaged with the understanding that they will be occupied for the entire session, unless otherwise agreed on by both parties. Table board is usually engaged by the week, or, if so stated, by the day.

The price of table board runs from \$4 and \$4.50 in boarding houses, to \$7 and \$10 at the hotels. Living at hotels costs from \$10.50 up.

The University has one residence hall, Sage College, with an annex, Sage Cottage. This is open for women throughout the Summer School. Married men accompanied by their wives may be lodged in Sage Cottage, where the first and second floors are reserved for them. The price of rooms in Sage College is \$1.25 to \$5.50 a week, according to location, and the price of table board is \$5. Unfortunately, at the time this announcement goes to press the capacity of the building has been almost entirely engaged. Persons strongly preferring to room in the university dormitories may make application to The Manager of Sage College, Ithaca, N. Y., and be placed on the waiting list in case vacancies should occur. Every application for a room to be reserved must be accompanied by a deposit of \$5, otherwise the application is not registered. The amount of this deposit is deducted from the rent if the room assigned be occupied by the applicant; it is refunded if the applicant gives formal notice to the manager on or before June 15 that she desires to withdraw the application.

Persons desiring assistance in engaging comfortable rooming and boarding places will, on application to The Secretary, College of Agriculture, after June 1, be furnished with a list of approved places.



The whole expense of attendance at the Summer School, not including laboratory fees, may be estimated at \$65 to \$85.

### THE LIBRARIES

The University Library is open on week days from 9 a.m. to 5 p.m., except Saturday, when it closes at 1 p.m. In this are housed the main library, containing about four hundred thousand volumes, and most of the seminary and special libraries. The main reading room affords accommodations for over two hundred readers, and contains a selected library of over eight thousand volumes of reference works. Adjacent to it is the periodical room, in which are kept the current numbers of about five hundred journals in various fields of knowledge. These rooms are open to all students. Students properly qualified are allowed the use of the seminary rooms and of the books in them. The main collection is primarily a library of reference for use in the building. Students are, however, allowed to a limited extent to take out books for home use. Persons wishing this privilege must make a deposit of \$5, which will be refunded on the return of all books taken out.

The library of the College of Agriculture, on the first floor of the main building, is open on week days from 9 a.m. to 5 p.m., except Saturday, when it closes at 1 p.m. In it will be found a large collection of bulletins and reports of experiment stations, reference books on agriculture and country life, agricultural periodicals, and the like. The entomological library, housed in the Department of Entomology on the third floor of the main building, is one of the most complete of its kind in the United States. Nearly all of the departments in which instruction is given have well-selected departmental libraries.

### LECTURES, MUSICAL RECITALS, EXCURSIONS

In addition to the regular class room work there will be evening lectures on topics of general interest through the session.

For several years the lectures before the University Summer Session on Monday evenings have formed a course treating problems in some field of science. In 1912 they will be given by Professor J. S. Shearer on chosen topics in physics. These lectures are open to students in the Summer School in Agriculture.

In addition to these there are weekly lectures of general interest in connection with the various departments. Notice of these will be given in the University Calendar each week.

Musical recitals will be given on Tuesday and Thursday evenings in the Sage Chapel.

On occasional Wednesday evenings special lectures on agricultural or country life subjects, or informal assemblies of all students registered in the Summer School in Agriculture, will be arranged. Notice of these will be given from week to week. In connection with the work of several departments excursions are made to points of interest. Most of these are open to members of the Summer School. Notice of them is given from week to week.

An informal reception of all summer students will be held on some evening at the beginning of the summer session. This, it is hoped, will assist students in the Summer Session and the Summer School in becoming acquainted with the members of the staff of instruction and with one another.



### RAILROAD ROUTES AND RATES

Ithaca is reached by either the Lehigh Valley or the Lackawanna Railroad. By the latter, a branch leaves the main line at Owego. Through trains run from New York and Buffalo on the Lehigh, and through sleeping cars run daily from New York on both roads. From Philadelphia, Baltimore, Washington, and the South, via the Baltimore & Ohio, the Philadelphia & Reading connects with the Lehigh at Bethlehem. On the Lehigh, through trains for Ithaca connect with the New York Central at Auburn, and with the Pennsylvania (Northern Central) and the Erie at Elmira.

From nearly all important points in the Middle and Atlantic Coast States summer excursion tickets may be purchased to Ithaca. From Central and Western States it is generally possible to buy excursion tickets to Niagara Falls, in case an excursion rate to Ithaca is not available.

At the time this pamphlet goes to press it is not possible to give specific rates. Persons interested should, some time in advance of their departure, make inquiry of the railroad agent at their home town. If full information cannot be obtained in this way, write to the Secretary of the College of Agriculture.

### COURSES OF INSTRUCTION

The courses of instruction are announced in five distinct groups or schools, namely, agriculture (2), nature study and elementary agriculture, home economics, and entomology. Persons in the Summer School may specialize in any one of these groups, or may elect such courses from any of them as they may be able to schedule and are qualified to pursue. Ordinarily it will be advantageous to confine one's attention chiefly to the subjects in one of the groups, and to return another summer if instruction in a second group is desired.

#### I. AGRICULTURE

The following courses, numbered one to fourteen inclusive, are intended primarily for school superintendents, high-school teachers, and others desiring to cover the field of agriculture in a general way during the Summer School. They are scheduled so that all may be taken without conflict; or one or more may be omitted and elective subjects from other groups added, as desired. The first seven courses will continue for three weeks, July 8 to 27, when they will be discontinued and the last seven (numbers 8 to 14) taken up for three weeks, July 29 to August 16. No university credit is allowed for any of these fourteen courses, but certificates showing work done are given on application at the close of the Summer School.

#### Courses given during the first three weeks, July 8 to 27

1. **Animal Husbandry.** Lectures, T Th S, 9, Animal Husbandry Lecture Room. Practice, T, 2-4.30, Judging Pavilion. Professor WING and Assistant Professors HARPER and SAVAGE.

A discussion of the principles of feeding horses and dairy cattle, principles of breeding animals, and the historical development of the leading breeds of horses and dairy cattle.



2. **Economic Entomology.** Lectures, F S, 8, Main 292. Laboratory, S, 10-12.30, Main 392. Assistant Professor HERRICK.

A course in which the common insect pests of the farm, garden, and orchard are discussed and measures of control considered. The lectures will be illustrated by specimens, charts, and lantern slides. One laboratory period a week will be devoted to a study of the actual insects in the laboratory and field.

3. **Farm Crops.** Lectures, M W F, 9, Main 292. Laboratory, F, 2-4.30, Agronomy 202. Professor MONTGOMERY and others.

Classification of farm crops; agricultural importance of various classes; and a brief study in class room and laboratory of the principal types of importance in New York State.

4. **Poultry Husbandry.** Lectures, T Th, 10, Dairy 222. Laboratory, Th, 2-4.30, Main 202. Professor RICE, Assistant Professor ROGERS, Mr. BENJAMIN, and Mr. KENT.

The subjects to be discussed in the lectures are: the breeds; poultry house construction; feeding for egg production; marketing; rearing chickens; breeding for egg production. The laboratory exercises include: judging the breeds; grading and candling eggs; study of the egg. Laboratory fee, fifty cents.

5. **Soils.** Lectures, M W F, 10, Main 292. Laboratory, W, 2-4.30 and F, 11-1, Agronomy 42. Mr. BUCKMAN and Mr. KLEIN.

A practical course in soils, their primary characteristics and modes of handling. The lectures will include a discussion of the formation and classes of soils; tith; soil moisture; soil amendments; fertilizers and manures; soil biology; and soil management from the standpoint of plant production. The laboratory work will consist in field trips and demonstrations. Some knowledge of geology and chemistry will be a great aid in pursuing this course. Laboratory fee, fifty cents.

6. **Vegetable Gardening.** Lectures, M W, 11, Main 232. Laboratory, M, 2-4.30, Greenhouses. Mr. WORK.

The lectures will include: a brief outline of the scope of the subject; a discussion of a few of the problems and methods that are peculiar to it; the planning and management of the home garden; vegetable crops from both home and commercial standpoints. The laboratory work will be planned to bring the student into touch with vegetable gardening problems and practices, as illustrated in the college and in neighboring greenhouses and gardens.

7. **Weather, Climate, and Crops.** Lectures, T Th, 11, Main 292. Professor W. M. WILSON.

The fundamentals necessary to an understanding of the earth's atmosphere as a whole; the distribution and relation of temperature, pressure, winds, and moisture; the principles of weather forecasting; frosts and methods of protection; and the relation of weather and climate to general and special agriculture.

#### Courses given during the second three weeks, July 29 to August 16

8. **Agricultural Chemistry.** Lectures, M W F, 10, Morse Hall Lecture Room 3. Laboratory, W, 2-4.30, Quantitative Laboratory, Morse Hall. Professor CAVANAUGH and Mr. CROSS.

A discussion of the relations of chemistry to agriculture, including the sources of fertilizing materials, their preparation for use, and a study of the various forms of lime.



9. **Farm Management.** Lectures, M W F, 9, Main 292. Laboratory, S, 8-10.30, Agronomy 202. Assistant Professor LIVERMORE.

Lectures on the more important principles of farm management. Discussions and laboratory work on types of farming, cropping systems, farm accounts, farm layout, marketing, and successful farms.

10. **Farm Mechanics.** Lectures, T Th, 11, Animal Husbandry Lecture Room. Laboratory, F, 11-1, Farm Mechanics Building. Assistant Professor H. W. RILEY.

The work in this subject will be arranged to show the method of giving instruction in farm mechanics. Rope splicing, belt lacing, the plow, the grain binder, and the gasoline engine will be used as the subjects for laboratory study.

11. **Floriculture.** Lectures, M W, 11, Main 232. Practice, M, 2-4.30, Greenhouses. Assistant Professor BEAL.

The lectures will include a brief outline of the scope of the subject; the use of flowers in and around the home; flower crops for the farm; flowers from a commercial standpoint; floricultural opportunities in the state and nation. The laboratory work is designed to give the student practice in the propagation, potting, shifting, and care of plants. The culture of the important flower crops will be illustrated by plants growing on the horticultural grounds.

12. **Milk and its Products.** Lectures, T Th, 9, Dairy 222. Laboratory, T, 2-4.30, Dairy 232. Professor STOCKING, Assistant Professor ROSS, Mr. GUTHRIE, and Mr. FISK.

The lectures will discuss bacteria in relation to dairy products; testing of milk; composition of milk; butter making; cheese making, with special reference to fancy cheese. The laboratories will include work on the nature of bacteria and their action on dairy products, and on the testing of milk for fat and for solids.

13. **Plant Diseases.** Lectures, T Th, 8, Main 292. Laboratory, Th, 2-4.30, Agronomy 302. Professor WHETZEL and Mr. ———.

The lectures will discuss some of the more common diseases of fruit and other crops, with practical means of control. A microscopical study of the organisms causing these diseases will be made in the laboratory, together with an examination of the effect of the diseases on the plants. The relation of the control of the disease to the life history of the causal organism will be explained. Laboratory fee, seventy-five cents.

14. **Pomology.** Lectures, T Th, 10, Main 292. Laboratory, F, 2-4.30, Main 202. Professor C. S. WILSON and Mr. ANTHONY.

A study of the principles and practice of fruit growing. The topics considered are: methods of propagation, including budding and grafting; soils; varieties and planting plans; cultivation, cover crops, fertilization, spraying, and pruning; the picking, grading, and marketing of fruit.

## II. AGRICULTURE

The following courses, each continuing for six weeks, are intended for persons desiring special training in the subjects. They are much more extended than those given above (pages 11-13). With the outside study required, each will occupy one-third to one-half of the student's time. University credit is allowed for the work. The courses are comparable with the introductory courses in the



same departments given during the regular university year, and will be accepted for graduation in place of those courses.

**A. Agricultural Chemistry.** Credit three hours. Prerequisite Chemistry 1 or its equivalent. Lectures, daily except S, 9. Recitations, T Th, 10. Morse Hall Lecture Room 3. Professor CAVANAUGH and Mr. CROSS.

A general course treating of the relations of chemistry to agriculture and dealing with the composition and chemical properties of plants, soils, fertilizers, feeding stuffs, insecticides, and fungicides.

**B. Agricultural Chemistry.** Credit one hour. Prerequisite Chemistry 1 and 6 or the equivalent. M W F, 10-1, Qualitative Laboratory, Morse Hall. Professor CAVANAUGH and Mr. CROSS.

A laboratory course supplementing course A. Laboratory deposit, \$10.

**A. Principles and Practice of Feeding Animals.** Credit two hours. Lectures, M W F, 10. Practice, T Th, 10-12. Animal Husbandry Building. Assistant Professor SAVAGE.

The general principles of animal nutrition; the study of feeding standards the common grain and commercial feeds, the formulation of rations, etc.

**B. Principles of Animal Breeding.** Credit two hours. Lectures, daily except S, 9, Animal Husbandry Building. Assistant Professor HARPER.

A general discussion of the principles of heredity as applied to the breeding of animals, with a study of animal form; origin and formation of breeds; crossing and grading, with an outline of the methods of registration and the study of records and pedigrees. Demonstrations, essays, and reports will be required in addition to the lectures.

**A. Farm Crops.** Credit two hours. Lectures, T Th S, 8, Agronomy 192. Laboratory, T Th, 2-4.30, Agronomy 202. Professor MONTGOMERY and Mr. —.

A general study of the principal cereal and forage crops in New York State, their distribution, important soil and climatic requirements, and cultural methods. Laboratory fee, \$1.

**A. Farm Poultry.** Credit one hour. Lectures, T Th, 12, Dairy 222. Laboratory, W, 2-4.30, Main 202. Professor RICE, Assistant Professor ROGERS, Mr. BENJAMIN, and Mr. KENT.

The subjects discussed at the lectures are: the breeds; poultry house construction; preparation of eggs for market; preparation of poultry for market; marketing of poultry and eggs; incubation; rearing of chickens; the principles of breeding; breeding for egg production; poultry farm management; feeding for egg production; diseases of poultry. The subjects to be presented in laboratories are: judging the breeds; grading and testing eggs; grading and packing poultry; anatomy of poultry; study of the egg; study of feeds and sanitation. Laboratory fee, \$1.

**A. General Plant Physiology.** Credit four hours. Prerequisite all freshman work in agriculture or its equivalent. Lectures, daily, 9, Agronomy 192. Laboratory, daily, 10-12.30, Agronomy 21. Assistant Professor KNUDSON.

Lectures and laboratory work supplemented by field studies. The topics include absorption, metabolism, relation to environment, growth, reproduction, and propagative process. Laboratory fee, \$5.

**B. Special Problems in Plant Physiology.** Special work in certain phases of physiology, including ecology and fermentation. Admission to work and hours arranged only by appointment. Assistant Professor KNUDSON.



A. **Milk Composition and Tests.** Credit two hours. Lectures, M W F, 8, Dairy 222. Laboratory, M W F, 2-4.30, Dairy 232. Assistant Professor ROSS and Mr. McINERNEY.

The topics considered are secretion and composition of milk, samples, lactometer, Babcock fat test, acid tests, moisture test, salt test, preservative tests. Laboratory deposit, part returnable, \$3.

A. **Plant Pathology.** Credit three hours. Prerequisite Botany 1 and 2 or the equivalent. Lectures, M W F, 8, Agronomy 302. Laboratory, T W Th F, 2-4.30, Agronomy 302. Professor WHETZEL and Mr. ———.

A fundamental course treating of the common diseases of cultivated plants, their nature, cause, and control. A prerequisite to all other courses in plant pathology. Laboratory fee, \$4.50.

A. **Principles of Soil Management.** Credit three hours. Prerequisite Chemistry 1 and Geology 1 or the equivalent. Lectures, daily except S, 8, Agronomy 152. Laboratory, M T Th, 2-4.30, Agronomy 42. Mr. BUCKMAN and Mr. KLEIN.

A fundamental course dealing with the origin, composition, and properties of soils with particular reference to their management in crop production. The laboratories will consist in practice designed to demonstrate fundamental physical relations, and will be supplemented by laboratory lectures. Laboratory deposit, \$3.

### III. NATURE STUDY AND ELEMENTARY AGRICULTURE

Each of the following courses will continue throughout the six weeks of the Summer School.

A. **General Nature Study.** Credit two hours. Lectures, M W, 9, Main 302. Field and laboratory observations, M W F, 2-4.30. Dr. EMBODY and Miss SMITH.

I. First three weeks: observation of the habits of common birds, with special reference to their nesting; the habits of the toad, frog, salamander, turtle, and other reptiles; special attention to the habits and haunts of common fishes; field notes on the habits of common wild mammals, including squirrels, chipmunks, mice, moles, woodchucks, etc.; a study of the natural habits and adaptations of some of the domestic animals, including the horse, cow, sheep, and pig; of the life histories of some common butterflies and moths, and other insects of orchard and garden; aquatic insects; and a study of the honeybee in observation hives.

II. Second three weeks: field observations on the life histories of the plants of the garden, open fields, moist ravines, marshes, and woods, special attention being given to the relation of the plants of the garden to their insect visitors; observations on the character, the habitat, and the fruit of common trees, especially fruit and nut trees, evergreens, and shade trees.

III. Lectures, first three weeks, to supplement and elucidate the field work in part I, including also the use of this material in the school, and the building and maintaining of breeding cages and aquaria.

IV. Lectures, second three weeks, on the habits, life histories, and uses of the plants and trees studied in part II, and the literature concerning them.

B. **Training Course in Natural History Method.** Credit one hour. Field and laboratory work, T Th, 8-11, Main 302. Professor NEEDHAM, Dr. EMBODY, and Mr. ALEXANDER.



More careful and extended work in a few selected natural history subjects. The work of the first three weeks will center about pond life; that of the second three weeks, about the relations between flowers and insects. The students will gather their own material, and a considerable part of the work will be done by each one individually and alone. Results will be rigidly graded, and university credit will be given for satisfactory completion of the course. Each student will provide himself with a good pocket lens, air and water nets, and the book containing outlines of the practical exercises. Membership in the class will be limited to twenty persons.

**C. Elementary Agriculture and Nature Study.** Lectures, demonstrations, and conferences, T Th, 2-4.30, Rural Schoolhouse. Miss McCLOSKEY and Mr. TUTTLE.

Pedagogical work in elementary agriculture and nature study as outlined in the New York State Syllabus. This course is designed for district superintendents, training-class teachers, and all other teachers interested in rural education. The Cornell Rural School Leaflet, in which is published subject matter on the topics outlined in the New York State Syllabus, will furnish the text for this course. Subject matter will be presented and schoolroom methods of conducting the lessons demonstrated. Professors in the College of Agriculture who have prepared the articles for the Leaflet will give lectures and demonstrations. The fundamental educational value as well as the economic importance of school work in soils, animal husbandry, farm crops, gardening, fruit growing, poultry, forestry, bird study, and the like will be discussed. Simple apparatus suitable for use in schools will be considered; also books for the school library. The Rural Schoolhouse will be made a center for working out some of the problems relating to school work in elementary agriculture and nature study.

Excursions. 1. An afternoon on the farm with a naturalist and an agriculturist. 2. A night trip to the woods.

**D. Rural School Education.** Lectures, M W, 10, Agronomy 192. Professor MACCAUGHEY, Professor TUCK, Miss McCLOSKEY, and others.

This course will consider rural school conditions; the field of agriculture in education; the relations of school and community; teachers' associations; farmers' institutes; extension work; the relation of rural schools; the rural schoolhouse and grounds; the rural teacher; the rural library; and other topics of importance in rural education.

**E. School Gardening.** Lectures and laboratory, F S, 8-11, Rural schoolhouse and Gardens. Professor MACCAUGHEY, Miss McCLOSKEY, and Mr. HUNN.

This course will include several lectures on school gardens in city and country; practical work on soils; preparing the ground; planting; caring for the garden; harvesting; exercises in judging garden plats; discussion of trees, vines, shrubs, and herbaceous plants suitable for the school garden; a child's home garden; discussion of window boxes; the nature study of the garden; literature.

**F. Textbook Work in Agriculture.** Daily except S, 11, Agronomy 192. Professor MACCAUGHEY and Miss MOORE.

Designed to help teachers to use intelligently a textbook in agriculture in high schools or in the seventh and eighth grades. Demonstrations in connection with the lectures. Model lessons will be given with classes of girls and boys.



**G. Trips Afield.** A series of dawn and sunset walks, to some of the interesting places near the Campus. T, 6 a. m., Th, 6.30 p. m. Professor MACCAUGHEY and others.

The trips will be short, will not exceed an hour and a half in time, and will be entirely informal in character. The provisional program is: T, over the farm, Forest Home path; Cascadilla path; Ithaca Falls; Beebe Lake; over the farm. Th, the pine woods; Cornell Heights woods; Six-mile Creek; Renwick marshes; South Hill.

#### IV. HOME ECONOMICS

Each of the following courses will continue throughout the six weeks of the Summer School. All work is given on the fourth floor of the main building of the College of Agriculture.

**A. Foods.** Credit four hours. Lectures and recitations, daily except S, 9. Laboratory practice, daily except S, 11-1.30. Professor ROSE.

A course for establishing a fundamental knowledge of foods. The lectures will include a discussion of the sources, composition, and characteristics of food-stuffs; principles governing the selection of foods and methods of preparing them; food preservation; comparative nutritive value and cost of various foods; selection, planning, and serving of well-balanced meals. The laboratory work, closely following the lectures, will consist of experiments in determining the characteristics of foodstuffs as these relate to the preparation of food and to practical problems of cookery.

**B. Human Nutrition.** Credit two hours. Lectures and recitations, daily except S, 10. Professor ROSE.

A discussion of the methods of investigating dietary problems; the practical means of applying scientific principles in planning family and institution dietaries; consideration of special problems of nutrition, as in infant feeding and feeding in cases of abnormal nutrition.

**C. Home Economics.** Credit two hours. Lectures and recitations, daily except S, 8. Professor VAN RENSSELAER.

Domestic factors in cost of living; waste; standards of living; extravagance. Cost of food, shelter, clothing; marketing. Family budgets; distribution of income; savings. Domestic service.

**D. Household Sanitation.** Credit one hour. Lectures and recitations, M W F, 11. Professor VAN RENSSELAER.

Household bacteriology; cleanliness of soil, air, water, food; disposal of waste; insect pests, infection, immunity, methods of disinfection; good house-keeping in relation to public health; healthful living to promote efficiency; physical exercise and rest.

**E. Extension in Home Economics.** Credit one or two hours. Lectures, T Th, 11. Practice by appointment. Professor VAN RENSSELAER.

Principles of extension work with special reference to rural communities; organization; material to be presented; manner of presentation; speaking; writing.



## V. ENTOMOLOGY

The instruction in entomology, formerly given in the University Summer Session, has now been transferred to the Summer School in Agriculture. The following courses will be continued throughout the six weeks of the Summer School. Students qualified to do advanced work will be granted the facilities of the laboratories, field stations, and library, after the close of the regular session. Members of the staff in residence during this period will be glad to consult with and aid such students.

Laboratory fees, varying with nature of materials demanded from \$.50 to \$1.50 for an hour of academic credit, will be charged in these courses.

A. **General Entomology.** Credit two or three hours. Lectures, daily except S, 8, Main 392. Laboratory and field work, for those not taking course B, M W F, 2-4.30, Main 391. Assistant Professor RILEY and Dr. MATHESON.

An introductory course dealing with the biology, habits, economic importance, and relationships of insects.

B. **Laboratory Course in the Morphology and Classification of Insects.** Credit two or more hours. Laboratory open daily except S, 8 to 5, Main 391. Assistant Professor RILEY and Dr. MATHESON.

Study of the external anatomy of typical insect forms; the collecting, mounting, and classifying of representatives of all the orders and the chief families of insects. While the systematic work will give a general survey of the field, each student may direct his energies toward the collecting of any group in which he is particularly interested.

C. **Research.** Opportunities will be offered for advanced work and research in various phases of entomology. Properly qualified students registered as candidates for advanced degrees may elect thesis work under any member of the department who is in residence during the summer.

**Seminary.** The work of an entomological seminary is conducted by the Jugatae, an entomological club that meets for the discussion of current literature and of the results of investigations.

### Special Courses

In addition to the work outlined above the following special afternoon courses, one week each, will be offered by various members of the department. Emphasis will be placed on general principles and methods of work. Visitors who are especially interested in entomological subjects are invited to enroll for any part or for the entire series. Students who are registered for credit in the department may count attendance on these courses as laboratory time.

1. **Aquatic Insects.** Lectures and field work illustrative of the biology of aquatic insects. Entomological laboratories, Field Station in the Renwick marshes. July 8 to 12. Professor NEEDHAM.

2. **Aquatic Insects,** continued, with special reference to their utilization as fish food. Entomological Lecture Room and Experimental Fish Hatchery. July 15 to 19. Dr. EMBODY.

3. **Economic Entomology.** Its problems and methods. Lectures, demonstrations, field work, and discussion of insectary methods. July 22 to 26. Assistant Professor HERRICK.

4. **Insects and Disease.** Lectures, demonstrations, and laboratory work on the work of insects and their allies in the transmission and dissemination of diseases of man. July 29 to Aug. 2. Assistant Professor RILEY.

5. **Photography and Lantern-Slide Making as an Aid to Entomological Work.** Lectures and demonstrations, Insectary. August 5 to 9. Assistant Professor CROSBY.

6. **Systematic Entomology.** Field and laboratory work designed to familiarize the student with special methods of collecting and preparing insects for the cabinet. At least one night excursion will be arranged. August 12 to 15. Assistant Professor BRADLEY.

#### ADDITIONAL ELECTIVE COURSES

The regular Summer Session of Cornell University, which is in session at the same time, offers a great variety of courses, any of which may be elected by students in the Summer School in Agriculture on the payment of certain fees (see page 8). Particular attention is called to the following subjects: education, psychology, economics and social science, music, physics, chemistry, geography, geology, botany, zoology, physiology, and industrial education, including hand-work. A course in meteorology and climatology, in addition to the brief course in the School in Agriculture, continues throughout the Summer Session.



OFFICIAL PUBLICATIONS OF CORNELL UNIVERSITY

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These publications include

Catalogue Number (containing lists of officers and students), price 25 cents,  
Book of Views, price 25 cents,

Directory of Faculty and Students, First Term, 1911-12, price 10 cents,  
and the following informational publications, any one of which will be sent gratis and post-free on request. The date of the last editon of each publication is given after the title.

General Circular of Information for prospective students, January 1, 1912.

Announcement of the College of Arts and Sciences, June 15, 1912.

Announcement of Sibley College of Mechanical Engineering and the  
Mechanic Arts, Feb. 15, 1912.

Announcement of the College of Civil Engineering, March 1, 1912.

Announcement of the College of Law, May 15, 1912.

Announcement of the College of Architecture, March 15, 1912.

Announcement of the New York State College of Agriculture, Oct. 1, 1911.

Announcement of the Winter Courses in the College of Agriculture, November 1, 1911.

Announcement of the Summer School in Agriculture, July 1, 1912.

Announcement of the New York State Veterinary College, April 15, 1912.

Announcement of the Graduate School, January 15, 1912.

Announcement of the Summer Session, April 1, 1912.

Annual Report of the President, December 1, 1911.

Pamphlets on scholarships, fellowships, and prizes, samples of entrance and scholarship examination papers, special departmental announcements, etc.

Correspondence concerning the publications of the University should be addressed to

The Registrar of Cornell University,  
Ithaca, N. Y.