CORNELL UNIVERSITY
OFFICIAL PUBLICATION

VOLUME IX NUMBER 8

# NEW YORK STATE COLLEGE OF AGRICULTURE ANNOUNCEMENT OF THE SUMMER TERM 1918

MARCH 15, 1918
PUBLISHED BY CORNELL UNIVERSITY
ITHACA, NEW YORK

# CALENDAR

## Summer Term, 1918

| | | |
|---|---|---|
| June 3, | Monday, | Registration of all students. |
| June 4, | Tuesday, | Instruction begins in all courses. |
| July 4, | Thursday, | Holiday. |
| Sept. 28, | Saturday, | Instruction ends. |

## Summer Session

| | | |
|---|---|---|
| July 8, | Monday, | Summer Session begins. |
| Aug. 16, | Friday, | Summer Session ends. |

## Fall Term, 1918–19

| | | |
|---|---|---|
| Sept. 27, | Friday, | Entrance examinations begin. |
| Oct. 7–8, | Monday–Tuesday, | Registration of new students. |
| Oct. 9, | Wednesday, | Registration of old students. |
| Oct. 10, | Thursday, | Instruction begins. |
| Oct. 12, | Saturday, | Registration, Graduate School. |

# NEW YORK STATE COLLEGE OF AGRICULTURE

## STAFF OF INSTRUCTION AND EXTENSION WORK

Jacob Gould Schurman, A.M., D.Sc., LL.D., President of the University.
Albert Russell Mann, B.S.A., A.M., Dean of the College of Agriculture, Director of the Experiment Station, and Director of Extension.
Isaac Phillips Roberts, M.Agr., Professor of Agriculture, Emeritus.
John Henry Comstock, B.S., Professor of Entomology and General Invertebrate Zoology, Emeritus.
Henry Hiram Wing, M.S. in Agr., Professor of Animal Husbandry.
Thomas Lyttleton Lyon, Ph.D., Professor of Soil Technology.
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 to Agriculture.
George Nieman Lauman, B.S.A., Professor of Rural Economy.
Herbert Hice Whetzel, M.A., Professor of Plant Pathology.
Elmer Otterbein Fippin, B.S.A., Extension Professor of Soil Technology.
George Frederick Warren, Ph.D., Professor of Farm Management.
William Alonzo Stocking, M.S.A., Professor of Dairy Industry.
Wilford Murry Wilson, M.D., Professor of Meteorology.
Ralph Sheldon Hosmer, B.A.S., M.F., Professor of Forestry.
James George Needham, Ph.D., Professor of Entomology and Limnology.
Rollins Adams Anderson, D.Sc., Professor of Plant Breeding.
Harry Houser Love, Ph.D., Professor of Plant Breeding Investigations.
Donald Reddick, Ph.D., Professor of Plant Pathology.
Edward Gerrard Montgomery, M.A., Professor of Farm Crops.
George Alan Works, B.Ph., M.S. in Agr., Professor of Rural Education.
Flora Rose, B.S., M.A., Professor of Home Economics.
Martha Van Rensselaer, A.B., Professor of Home Economics.
William Albert Riley, Ph.D., Professor of Insect Morphology and Parasitology.
James Adrian Bizzell, Ph.D., Professor of Soil Technology.
Glenn Washington Herrick, B.S.A., Professor of Economic Entomology and Entomologist of the Experiment Station.
Howard Wait Riley, M.E., Professor of Rural Engineering.
Harold Ellis Ross, M.S.A., Professor of Dairy Industry.
Hugh Charles Troy, B.S.A., Professor of Dairy Industry.
Samuel Newton Spring, B.A., M.F., Professor of Silviculture.
Karl McKay Wiegand, B.S., Ph.D., Professor of Botany.
William Henry Chandler, M.S. in Agr., Professor of Pomology.
Arthur Bernhard Recknagel, B.A., M.F., Professor of Forest Management and Utilization.
Merritt Wesley Harper, M.S., Professor of Animal Husbandry.
Cyrus Richard Crosby, A.B., Extension Professor of Entomology.
Elmer Seth Savage, M.S.A., Ph.D., Professor of Animal Husbandry.
Kenneth Carter Livermore, M.S. in Agr., Professor of Farm Management.
Edward Albert White, B.Sc., Professor of Floriculture.
Alvin Casey Beal, Ph.D., Professor of Floriculture.
Herbert Andrew Hopper, B.S.A., M.S., Extension Professor of Animal Husbandry.
Edward Sewall Guthrie, M.S. in Agr., Ph.D., Professor of Dairy Industry.
Maurice Chase Burritt, M.S. in Agr., Professor and Vice Director of Extension.
William Charles Baker, B.S.A., Professor of Drawing.
Mortier Franklin Barrus, Ph.D., Extension Professor of Plant Pathology.
Lewis Josephus Cross, B.A., Ph.D., Professor of Chemistry in its Relations to Agriculture.
Oskar Augustus Johannsen, A.M., Ph.D., Professor of General Biology.
Clyde Hadley Myers, Ph.D., Professor of Plant Breeding.

Bristow Adams, B.A., Professor, Editor and Chief of Publications.
Dick J. Crosby, M.S., Professor in Extension Service.
Asa Carlton King, B.S.A., Professor of Farm Practice.
Cornelius Betten, Ph.D., Professor, Secretary, and Registrar.
George Abram Everett, A.B., LL.B., Professor of Extension Teaching.
Frederick Llewellyn Griffin, B.S., M.S., Extension Professor of Rural Education.
Lewis Knudson, B.S.A., Ph.D., Professor of Botany.
E. Gorton Davis, B.S., Professor of Landscape Art.
Ralph Wright Curtis, M.S.A., Professor of Landscape Art.
Claude Burton Hutchison, M.S. in Agr., Professor of Plant Breeding.
Ralph Waldo Rees, A.B., B.S., Extension Professor of Pomology.
Jacob Richard Schramm, A.B., Ph.D., Professor of Botany.
Harry Oliver Buckman, M.S.A., Ph.D., Professor of Soil Technology.
Ralph Hicks Wheeler, B.S., Professor in Extension Service.
William Foster Lusk, B.Ph., M.S.A., Professor of Rural Education.
James Ernest Boyle, Ph.D., Extension Professor of Rural Economy.
Paul Work, A.B., M.S. in Agr., Acting Professor of Vegetable Gardening.
Rolland Maclaren Stewart, A.B., Ph.D., Acting Professor of Rural Education.
James Chester Bradley, Ph.D., Assistant Professor of Systematic Entomology.
John Bentley, jr., B.S., M.F., Assistant Professor of Forest Engineering.
George Charles Embody, Ph.D., Assistant Professor of Aquiculture.
Mrs. Helen Binkerd Young, B.Arch., Assistant Professor of Home Economics.
Mrs. Anna Botsford Comstock, B.S., Assistant Professor of Nature Study.
Harry Morton Fitzpatrick, Ph.D., Assistant Professor of Plant Pathology.
Byron Burnett Robb, B.S. in Agr., M.S. in Agr., Assistant Professor of Rural Engineering.
Walter Warner Fisk, M.S. in Agr., Assistant Professor of Dairy Industry.
Vern Bonham Stewart, Ph.D., Assistant Professor of Plant Pathology.
Annette J. Warner, Assistant Professor of Home Economics.
Royal Gilkey, B.S.A., Assistant Professor in Extension Service, and Supervisor of Reading Course for the Farm.
Charles Truman Gregory, Ph.D., Assistant Professor of Plant Pathology.
Lex Ray Hesler, Ph.D., Assistant Professor of Plant Pathology.
William Howard Rankin, Ph.D., Assistant Professor of Plant Pathology.
Earl Whitney Benjamin, B.S. in Agr., M.S. in Agr., Ph.D., Assistant Professor of Poultry Husbandry.
Arthur Johnson Eames, A.B., A.M., Ph.D., Assistant Professor of Botany.
James Kenneth Wilson, B.S., Ph.D., Assistant Professor of Soil Technology.
Elmer Eugene Barker, Ph.D., Assistant Professor of Plant Breeding.
Edward Mowbray Tuttle, B.S. in Agr., A.B., Assistant Extension Professor of Rural Education.
Robert Matheson, M.S. in Agr., Ph.D., Assistant Professor of Economic Entomology and Assistant Entomologist of the Experiment Station.
Blanche Evans Hazard, A.B., M.A., Assistant Professor of Home Economics.
David Lumsden, Assistant Professor of Floriculture.
John Hall Barron, B.S.A., Assistant Extension Professor of Farm Crops.
Gad Parker Scoville, B.S. in Agr., Assistant Extension Professor of Farm Management.
Arthur Augustus Allen, Ph.D., Assistant Professor of Ornithology.
Leonard Amby Maynard, A.B., Ph.D., Assistant Professor of Animal Husbandry.
Forest Milo Blodgett, Ph.D., Assistant Extension Professor of Plant Pathology.
Howard Edward Babcock, Ph.B., Assistant Professor, and State Leader of County Agents.
Edward Riley King, B.S., Assistant Professor of Entomology.
Frank Elmore Rice, A.B., Ph.D., Assistant Professor of Chemistry in its Relations to Agriculture.
Lester Whyland Sharp, B.S., Ph.D., Assistant Professor of Botany.
John Clarence McCurdy, B.S., C.E., Assistant Professor of Rural Engineering.
Clarence A. Boutelle, Assistant Professor of Animal Husbandry.

Charles Howard Royce, M.S.A., Assistant Extension Professor of Animal Husbandry.
George Harris Collingwood, B.S., A.M., Assistant Extension Professor of Forestry.
Montgomery Robinson, Litt.B., Assistant Professor in Extension Service.
Wesley Worth Warsaw, B.S. in A.E., Assistant Extension Professor of Soil Technology.
Otis Freeman Curtis, A.B., Ph.D., Assistant Professor of Botany.
Thomas Joseph McInerney, M.S. in Agr., Assistant Professor of Dairy Industry.
Eugene Davis Montillon, B.Arch., Assistant Professor of Landscape Art.
Juan Estevan Reyna, E.E., Assistant Professor of Drawing.
Leslie Eugene Hazen, B.S. in Agr., M.E., Assistant Professor of Farm Mechanics.
Earl Long Overholser, B.S.A., M.A., Assistant Professor of Pomology.
Arthur John Heinicke, B.S.A., M.A., Ph.D., Assistant Professor of Pomology.
Olney Brown Kent, B.S., Ph.D., Assistant Professor of Poultry Husbandry.
Henry William Schneck, B.S., M.S.A., Assistant Professor of Vegetable Gardening.
Karl John Seulke, M.S.A., Ph.D., Assistant Professor of Animal Husbandry.
Louis Melville Massey, A.B., Ph.D., Assistant Professor of Plant Pathology.
Ellis Lore Kirkpatrick, B.S.A., Assistant Professor of Vegetable Gardening.
Beulah Blackmore, B.S., Assistant Professor of Home Economics.
Paul J. Kruse, A.B., Ph.D., Assistant Professor of Rural Education.
Bernard Albert Chandler, B.S., M.F., Assistant Professor of Forest Utilization.
Ivan Claude Jagger, B.S., Assistant Professor of Plant Pathology.
Warren Kendall Blodgett, 2d, A.B., Assistant Extension Professor of Farm Mechanics.
Katharine Glover, Assistant Professor of Home Economics.
Dyer Barker Lake, B.S., M.S., Ph.D., Acting Assistant Professor of Animal Husbandry.
George Walter Tailby, jr., B.S.A., Instructor, and Stockman in Animal Husbandry.
Earle Volcart Hardenburg, B.S., M.S. in Agr., Instructor in Farm Crops.
Richard Alan Mordoff, B.S. in Agr., Instructor in Meteorology.
Oliver Wesley Dynes, B.S., M.S. in Agr., Instructor in Farm Crops.
James Lewis Strahan, B.S. in Agr., M.S. in Agr., Instructor in Farm Structures.
Cass Ward Whitney, B.S., Instructor in Extension Service.
Allan Cameron Fraser, B.S., Instructor in Plant Breeding.
Lua Alice Minns, B.S., Instructor in Floriculture.
George Cornell Supplee, M.S.A., Instructor in Dairy Industry.
Anna Elizabeth Hunn, B.S., Instructor in Home Economics.
William Thomas Craig, Instructor in Plant Breeding.
DeVoe Meade, B.S., Instructor in Animal Husbandry.
Edward Gardner Misner, B.S., Instructor in Farm Management.
Winfred Enos Ayres, Extension Instructor in Dairy Industry.
Clark Leonard Thayer, B.Sc., Instructor in Floriculture.
Ralph Sylvanus Moseley, Extension Instructor in Poultry Husbandry.
Lewis Merwin Hurd, Extension Instructor in Poultry Husbandry.
William Irving Myers, B.S., Instructor in Farm Management.
Albert Reiff Bechtel, B.S., A.M., Instructor in Botany.
James Marshall Brannon, B.A., M.A., Instructor in Botany.
Frank Burkett Wann, A.B., Instructor in Botany.
Wallace Larkin Chandler, B.S., M.S., Ph.D., Instructor in Parasitology.
Mary Frances Henry, A.B., Instructor in Home Economics.
Clara Louise Garrett, B.S., Instructor in Drawing.
Clarence Vernon Noble, B.S., Instructor in Farm Management.
Sarah Lucile Brewer, B.S., Instructor in Home Economics.
Charles Parsons Clark, B.S., Extension Instructor in Farm Management.
Anna Jane Hancy, A.B., A.M., Instructor in Botany.
Louis Arthur Zimm, B.S., Instructor in Plant Pathology.
Walter Gernet Krum, Instructor in Poultry Husbandry.
Howard Campbell Jackson, B.S., Instructor in Dairy Industry.
Julia Gleason, Instructor in Home Economics.
Claribel Nye, B.S., Extension Instructor in Home Economics.

Winifred Moses, B.S., Instructor in Home Economics.
Helen Canon, B.A., B.S., Extension Instructor in Home Economics.
Gustave Frederick Heuser, B.S., M.S. in Agr., Instructor in Poultry Husbandry.
Clarence Hamilton Kennedy, A.B., M.A., Instructor in Limnology.
Edwina Maria Smiley, A.B., Instructor in Plant Pathology.
Edward Henry Dusham, A.B., M.S., Instructor in Biology.
Mrs. Edith Fleming Bradford, B.S., Instructor in Home Economics.
Sara Buchanan Huff, Instructor in Home Economics.
George Clayton Dutton, Extension Instructor in Dairy Industry.
Benjamin Percy Young, B.S., Instructor in Entomology.
Peter Walter Claassen, M.A., Instructor in Natural History.
Roy Glen Wiggans, B.S.A., M.S.A., Instructor in Farm Crops.
Marshall Evarts Farnham, B.S., Instructor in Floriculture.
Frank Pores Bussell, B.A., Extension Instructor in Plant Breeding.
Roy Lewis Gillett, B.S., Instructor in Farm Management.
Mrs. Jessie Austin Boys, B.S., Instructor in Home Economics.
Laurence Joseph Norton, B.S., Instructor in Farm Management.
Charles Chupp, A.B., Ph.D., Instructor in Plant Pathology.
William Alonzo Whiting, B.S., Instructor in Dairy Industry.
Benjamin Dunbar Wilson, M.S., Instructor in Soil Technology.
Gertrude Elizabeth Douglas, A.B., A.M., Ph.D., Instructor in Botany.
Hazel Buell Bennett, B.S., Instructor in Rural Education.
John Phineus Benson, B.S., Instructor in Botany.
Ralph Simpson Nanz, B.S., Instructor in Botany.
Walter Conrad Muenscher, A.B., M.A., Instructor in Botany.
Harry Earl Bremer, B.S., Instructor in Dairy Industry.
Gladys Elizabeth Smith, B.S., Instructor in Home Economics.
Lawrence Erickson, A.B., Instructor in Botany.
Paul Berwig Schumm, M.L.D., Instructor in Landscape Art.
Frances Remington Kelley, B.A., Instructor in Home Economics.
Nancy Hill McNeal, Ph.B., Extension Instructor in Home Economics.
Walter Sprague Frost, B.S., Instructor in Agricultural Chemical Analysis.
Victor Ferdinand Tapke, B.S., Instructor in Plant Pathology.
Olin Clifford Krum, B.S., Instructor in Poultry Husbandry.
William J. Baerg, M.S., Instructor in Entomology.
Joseph Pullman Porter, B.S., Instructor in Landscape Art.
Lawrence Paul Wehrle, B.S., M.S., Extension Instructor in Entomology.
Robert Bier, B.S., Extension Instructor in Vegetable Gardening.
Ernest Charles Young, B.S., Instructor in Farm Management.
Alice May Blinn, B.S., Extension Instructor in Home Economics.
Ann Palmer Fisher, B.A., M.A., Instructor in Home Economics.
Rodney Wesson Pease, Instructor in Extension Service.
John Hallock Bromley, B.S., Instructor in Soil Technology.
Roy A. Olney, B.S., Critic Teacher of Agriculture.
Ada Eljiva Georgia, Assistant in Natural History.
Emmons William Leland, B.S.A., Superintendent of Field Experiments in Soil Technology.
Ward Benjamin White, A.B., Assistant in Dairy Industry.
Charles Edward Hunn, Assistant in Plant Propagation.
Mary Ellen Hill, B.S., Assistant in Biology.
Ralph Waldo Emerson Cowan, B.S., Assistant in Dairy Industry.
Ernest Gustaf Anderson, B.Sc., Assistant in Plant Breeding.
Charles Loring Allen, B.A., Assistant in Animal Husbandry.
Chester Columbus Demaree, A.B., Assistant in Botany.
Vernon Raymond Haber, B.S., M.A., Assistant in Biology.
Laura Florence, B.Sc., M.A., Assistant in Entomology.
Benjamin Harrison Smith, A.B., Assistant in Plant Pathology.
Walter Housley Wellhouse, M.A., Assistant in Entomology.
Carl Petty Blackwell, B.S., M.S., Assistant in Farm Crops.

Raymond Stratton Smith, B.S., B.S. in Agr., M.S., Assistant in Soil Technology.
Ralph James Morgan, B.S., Assistant in Soil Technology.
Thomas Lysons Martin, B.A., Assistant in Soil Technology.
Eleanor Hillhouse, B.S., Assistant in Home Economics.
Ivan Wright, A.B., M.S., Assistant in Rural Economy.
Mrs. Alice Van Scoy Crandall, B.S., Assistant in Home Economics.
Gordon Kennedy Middleton, B.S., Assistant in Farm Crops.
Ward Charles Jensen, B.S., Assistant in Farm Crops.
Hugh Irwin Macomber, B.S. in Agr., Assistant in Poultry Husbandry.
Frank Latta Fairbanks, M.E., Assistant in Farm Mechanics.
Helen Seaman, A.B., Assistant in Botany.
Freeman Weiss, B.S., Assistant in Botany.
Forrest Clifton Button, B.S., Assistant in Dairy Industry.
George Haines, B.S., Assistant in Animal Husbandry.
Helen Elizabeth Murphy, B.S., Assistant in Biology.
Ruth Isidor Metzger, A.B., Assistant in Pomology.
Mrs. Rita Hope Ballard Eames, B.A., Assistant in Botany.
Marshall Hertig, Assistant in Entomology.
Eugene Curtis Auchter, B.S. in Agr., Assistant in Pomology.
William Trowbridge Merrifield Forbes, Ph.D., Assistant in Entomology.
William Pringle Alexander, Assistant in Entomology.
Alice L. Peck, Assistant in Junior Extension.
Louis Michael Roehl, Supervisor of Farm Shop Work.
Clara Frances Sykes, A.B., B.S., Secretary of the Department of Home Economics.
Olin Whitney Smith, B.S., Assistant Registrar.
Willard Waldo Ellis, A.B., LL.B., Librarian.
George W. Parker, Executive Assistant.

# THE NEW YORK STATE COLLEGE OF AGRICULTURE

## SUMMER TERM

The college year in Cornell University is divided into two terms, or semesters, extending from the last of September to the early part of June. In the College of Agriculture there is, in addition, a third, or summer term, coordinate with the present fall and spring terms.

The primary purpose of the summer term is to take advantage of the growing season in teaching certain subjects to students regularly registered in either graduate or undergraduate courses. The facilities of the College are available for graduate study throughout the summer. In addition, opportunity is provided for advanced students, teachers, and others, who are otherwise engaged during the regular school year, to have the advantage of a long period of special instruction. Particular attention is given to the needs of assistants and instructors in colleges of agriculture who desire to spend their summers in advanced study.

Registration for the summer term will take place on June 3, 9 a. m. to 4 p. m. All students are expected to register first at the office of the University Registrar in Morrill Hall. They will then present themselves at the office of the Secretary of the College of Agriculture in Roberts Hall for further registration and arrangement of schedules. Instruction will begin at 8 a. m. on June 4. The summer term will close at 5 p. m. on September 18. No classes will be held on July 4.

The requirements for admission to the summer term are stated on page 12.

## THE COLLEGE OF AGRICULTURE

Cornell University is composed of eight colleges and the Graduate School. One of these colleges is the College of Agriculture.

Cornell University was chartered by the Legislature in 1865, being founded on the Land Grant Act of 1862. By the terms of the Land Grant Act, teaching in agriculture has been from the first a regular part of the University enterprise. In other states the state government has made appropriations to supplement the work in agriculture. In 1904 the Legislature of the State of New York made an appropriation of $250,000 for the erection of buildings for the College of Agriculture at Cornell University, and established the College as a state institution under the title "The New York State College of Agriculture at Cornell University." Before this time the State had established at Cornell University "The New York State Veterinary College." In 1906 the Legislature passed an Administration Act defining the purpose and activities of the College of Agriculture thus: "The object of the said college of agriculture shall be to improve the agricultural methods of the state; to develop the agricultural resources of the state in the production of crops of all kinds, in the rearing and breeding of livestock, in the manufacture of dairy and other products, in determining better methods of handling and marketing such products, and in other ways; and to increase intelligence and elevate the standards of living in the rural districts. For the attainment of these objects the college is authorized to give instruction in the sciences, arts, and practices relating thereto, in such cases and in such manner as shall best serve the interests of the state; to conduct extension work in dis-

seminating agricultural knowledge throughout the state by means of experiments and demonstrations on farms and gardens, investigations of the economic and social status of agriculture, lectures, publications of bulletins and reports, and in such other ways as may be deemed advisable in the furtherance of the aforesaid objects; to make researches in the physical, chemical, biological, and other problems of agriculture, the application of such investigations to the agriculture of New York, and the publication of the results thereof."

## THE BUILDINGS AND FARMS

**The buildings.** The buildings erected under the enactment of 1904 were first occupied in June, 1907. The central group then erected consisted of a main administration and classroom building, an agronomy building, and a dairy building, the three being connected by covered loggias. Subsequently the Legislature provided for the erection of two large barns, a greenhouse, a home economics building, a forestry building, a poultry husbandry building, a soils building, an auditorium, and a classroom building and stock judging pavilion for animal husbandry. An extension to the greenhouse range, several small poultry buildings, a sheep barn, a swine barn, a farm shop and tool shed, and an addition to the cafeteria in the Home Economics Building have been completed, and a heating plant has been installed.

Other buildings included in the present equipment are a frame building that temporarily houses the Department of Rural Engineering, an insectary, a biological station in the marsh at the south end of Cayuga Lake, a fish breeding house in Cascadilla Creek, a seed storage house, and other small buildings on the farms.

**The farms.** The College of Agriculture has 933 acres of land, and it rents 195 acres additional, making a total of 1128 acres under college management. These farms are not run for commercial but for educational purposes, and the practices are therefore modified to meet the varied demands of the institution.

Land in the vicinity of the College is very broken, abounding in hills and dales, brooks and gorges. In consequence, less than one-half of the total area is now available for tillage. Of the 1128 acres, 591 are classified as arable, 304 as pasture, and 143 as wood and waste; 51 are devoted to college grounds, buildings, and old orchards, and 39 are retained for other uses.

Of the tillable area, 45 acres have been laid out in permanent experiment plots for the use of the Departments of Soil Technology and Plant Breeding; 50 acres have been assigned to the Department of Pomology and are largely planted to young trees; 29 acres have been assigned to the Department of Floriculture; 24 acres to the Department of Vegetable Gardening; 73 acres to the Department of Poultry Husbandry; 15 acres to farm-crop gardens and experiments; and there are left to the Department of Farm Practice 355 acres on which to conduct the regular farm operations.

The soil of the college farms is heavy, nearly all of it being Dunkirk clay loam. A few fields at the extreme southeastern corner are Volusia stony loam. The Dunkirk clay loam is entirely unsuited to potatoes and is not well adapted to corn, but will grow fair crops of corn if heavily manured. It is well adapted to wheat, oats, timothy, and clover. The Volusia stony loam when well drained

and freed from stones is well adapted to corn and potatoes. The recently acquired areas lack both these improvements.

## EXPENSES

Tuition in the College of Agriculture is free to graduate students and to undergraduate students who for a year or more immediately preceding matriculation have been residents of the State of New York. The annual tuition fee for students from outside the State is $150 for two terms. The tuition fee for the summer term is $75.

Other fees, required of all students, are as follows:

| | |
|---|---|
| Matriculation fee | $ 5.00 |
| Fee for baccalaureate degree | 10.00 |

Deposit fees are required in various laboratory courses; inquiry concerning these should be made before registration. Students are liable to a special charge for breakage or damage resulting from their own carelessness. Attention is called to the expenses of excursions required in various courses.

The expense of textbooks, instruments, and other necessary articles varies from $10 to $75 a year.

There are many private boarding and rooming houses near the University campus. In these the cost of board and furnished room, with heat and light, varies from $6 to $12 a week. By the formation of clubs, students are sometimes able to reduce their expenses for room and board.

For more detailed information regarding fees, reference should be made to the college announcement for the year or to the General Circular of Information.

## GENERAL INFORMATION CONCERNING COURSES

The regular instruction in the College of Agriculture constitutes a course of four years, or eight terms, leading to the degree of Bachelor of Science. There is a combined course with the State Veterinary College leading to two baccalaureate degrees. Summer courses in agriculture, designed especially for teachers, school principals and superintendents, and advanced college students, are offered in the six-weeks Summer Session of the University. Aside from these there are winter courses without University credit, and opportunities for students to pursue special work. Circulars describing the winter courses and the short summer courses may be obtained on application to the Secretary.

Students may pursue agricultural subjects in the Graduate School of the University. For full information concerning graduate work and degrees, see the Announcement of the Graduate School.

## THE REGULAR FOUR-YEAR COURSE

Men who are candidates for admission to the regular, or four-year, course must be at least sixteen years of age; women must be at least seventeen years of age. They must have certificates of good moral character, and students from other colleges or universities are required to furnish from those institutions certificates of honorable dismissal. Students are admitted on examination, or

on presenting credentials of the Education Department of the State of New York, or on acceptable school certificates.

*Prospective students who have neither lived on farms nor had considerable practical experience in agriculture are urged to spend at least one year on a well-managed farm in order to familiarize themselves with common farm affairs and operations before entering the College. This experience is imperative in order to satisfy the farm-practice requirement.*

Candidates for admission must file their credentials and obtain permits for examination at the University Registrar's office, Morrill 10. The results of examination may be ascertained from the Registrar.

## ENTRANCE REQUIREMENTS FOR THE FOUR-YEAR COURSE

The subjects that may be offered for admission are named in the following list; the figures in parenthesis following each subject indicates its value in units and shows the maximum and the minimum amount of credit allowed in the subject. A unit represents five recitations a week for one year in a study.

1a. English No. 1 ..... (1½)
1b. English No. 2 ..... (1½)
2a. First Year Greek ..... (1)
2b. Second Year Greek ..... (1)
2c. Third Year Greek ..... (1)
3a. First Year Latin ..... (1)
3b. Second Year Latin ..... (1)
3c. Third Year Latin ..... (1)
3d. Fourth Year Latin ..... (1)
4a. First Year German ..... (1)
4b. Second Year German ..... (1)
4c. Third Year German ..... (1)
5a. First Year French ..... (1)
5b. Second Year French ..... (1)
5c. Third Year French ..... (1)
6a. First Year Spanish ..... (1)
6b. Second Year Spanish ..... (1)
6c. Third Year Spanish ..... (1)
7a. First Year Italian ..... (1)
7b. Second Year Italian ..... (1)
7c. Third Year Italian ..... (1)
8a. Ancient History ..... (½–1)
8b. Modern and Medieval History ..... (½–1)
8c. American History, Civics . (½–1)
8d. English History ..... (½–1)
9a. Elementary Algebra ..... (1)
9b. Intermediate Algebra ..... (½)
9c. Advanced Algebra ..... (½)
9d Plane Geometry ..... (1)
9e. Solid Geometry ..... (½)
9f. Plane Trigonometry ..... (½)
9g. Spherical Trigonometry ... (½)
10. Physics ..... (1)
11. Chemistry ..... (1)
12. Physical Geography ..... (½–1)
13. Biology* ..... (1)
14. Botany* ..... (½–1)
14a. Zoology* ..... (½–1)
15. Bookkeeping** ..... (½–1)
16. Agriculture (including home economics)** ..... (½–4)
17. Drawing ..... (½–1)
18. Manual Training ..... (1)
19. Any high school subject or subjects not already used (½–1)

For admission to the New York State College of Agriculture, an applicant must offer either A or B as below:

A. Fifteen units arranged as follows: English (3), history (1), elementary algebra (1), plane geometry (1), a foreign language† (3), elective (6). Solid geometry and plane trigonometry are recommended among the elective units for students entering the courses of forestry or landscape art.

---

*If an applicant has counted Biology (1), he may not also offer Botany (½) or Zoology (½).

**An applicant may not offer to exceed four units in vocational subjects under numbers 16, 18, and 19 combined. Bookkeeping may not be offered together with more than one of the subjects listed under 16, 17, and 18.

†French or German is recommended for entrance. For the Graduate School requirement with reference to a reading knowledge of French and German, see page 6 of the Announcement of the Graduate School.

B. The Arts College Entrance Diploma or the Science College Entrance Diploma issued by the Department of Education of the State of New York.

### Requirements for Admission of Special Students

Opportunities are provided for persons who desire to pursue special studies. In order to be eligible for admission to special work, applicants must offer two full years of recent farm experience and must also either have fifteen units of entrance credits or be twenty-one years of age. In addition, applicants for admission on the age requirement must satisfy the faculty of their ability to handle the work; and every applicant must satisfy the faculty of his bona fide desire for special study. He will be required to present an honorable dismissal from the school last attended, certificates of good moral character, and such other certificates and letters as may be desired. The special work is designed to meet the needs of young men and young women from farms who have not time for a four-year course, and of mature persons who desire to spend a brief period in specialized study. The work is not a definite "course" in the sense of having a program or a prescribed set of studies. The student chooses any of the agricultural "electives" that he is fitted to pursue. Certain courses are given by some of the departments for students who lack some of the fundamental work usually required in those subjects. Admission as a special student does not admit to classes. The student is admitted to the various classes by the heads of the departments concerned.

### Requirements for Admission to the Summer Term

Applicants for admission to the summer term as regular students in the four-year college course must, in addition to satisfying entrance requirements in full, have completed all the required work of the first two years of the regular course as outlined on pages 13–14, or the substantial equivalent thereof. Special students are admitted to the summer term on the same basis as to other terms, as recited above.

### Other Details for Admission

For other details as to subjects and methods for admission, see the General Circular of Information, which may be obtained on application to the Secretary, Cornell University, Ithaca, New York.

For admission to advanced standing from other colleges and universities all communications should be addressed to the Registrar of the University. See the General Circular of Information.

For admission as a special student, communications should be addressed to the Secretary, College of Agriculture, and attention is called to the paragraphs on page 30 of the General Circular of Information.

For admission to graduate work and candidacy for advanced degrees, communications should be addressed to the Dean of the Graduate School.

### Requirements for the Degree of Bachelor of Science

The requirements for the degree of Bachelor of Science shall be residence for eight terms, and, in addition to the prescribed work in the Department of Physical

Culture and of Military Science and Tactics, the completion of one hundred and twenty hours of required and elective work as outlined on pages 13–14.

All men students must satisfy the farm-practice requirement before the beginning of the senior year. Exemption from this requirement is allowed only to students specializing in the Department of Botany, Home Economics, Forestry, Entomology, or Landscape Art. Application for such exemption must be made at the office of the Secretary. All new students, except women, must report to the Department of Farm Practice as assigned at registration.

A student admitted to the College of Agriculture from another college in Cornell University, or from any other institution of collegiate rank, will be regarded as having completed the number of terms and hours to which his records entitle him, and will receive all the privileges of students who have completed the same number of terms and hours by residence in the College. In order, however, to obtain the degree of Bachelor of Science, he must have completed the prescribed subjects in the four-year course and the requisite number of elective hours in agricultural subjects. He must also have been in residence in the College of Agriculture for at least two consecutive terms and have completed not less than fifteen hours a term, of which two-thirds, at least, must be subjects taught by the staff of the College of Agriculture.

A student must register for at least six hours each term, and no new student may register for more than eighteen hours. Maximum registration by old students is determined on the basis of record.

Regular students may take at their discretion during their four years not to exceed twenty hours of elective subjects in courses offered in other colleges than Agriculture; but such elective subjects shall not interfere with required or back work. Special students must take at least two-thirds of the entire work of each year from subjects taught by members of the staff of Agriculture.

Students admitted before September, 1917, are subject to the requirements for graduation as stated in the regular announcement of 1916–17 and the summer term announcement of 1917.

## The Course Leading to the Degree of Bachelor of Science

| Freshman year | Number of course | Hours 1st term | Hours 2d term |
|---|---|---|---|
| English | 1 | 3 | 3 |
| Chemistry | 1 | 6 | – |
| Biology§ | 1 | – | 3 |
| Zoology | 1 | 3 | 3 |
| Botany | 1 | 3 | 3 |
| The Natural History of the Farm | 1 | 1 or | 1 |
| Electives* | | 0–3 | 3–6 |
| Total | | 15–18 | 15–18 |

§May be taken in sophomore year by students who have a major in home economics.

*Professional students in forestry who do not offer solid geometry and plane trigonometry for entrance are required to take these subjects in their freshman year.

| Sophomore year | Number of course | Hours 1st term | Hours 2d term |
|---|---|---|---|
| Geology‡ | 1 | 3 | – |
| Physics | 2 | – | 5 |
| Physiology, one of the following: | | | |
| Physiology of Domestic Animals | 10 | 3 | – |
| Human Physiology | 3 | – | 3 |
| Plant Physiology | 20 | 4 or | 4 |
| At least five hours in the following subjects: | | | |
| Chemistry | | | |
| Mathematics | | | |
| Bacteriology | | | |

In addition to the above, the required work in military drill and physical training must be taken.

Political Science 51 may be taken this year.

| Junior year | Number of course | Hours 1st term | Hours 2d term |
|---|---|---|---|
| Political Science | 51 | 3 | 3 |

## Elective Courses

The remainder of the work—sixty-nine or seventy hours—is made up of electives to be taken under the following restrictions:

A student may take at his discretion during his four years not to exceed twenty hours of elective subjects in courses offered in other colleges than Agriculture; but such elective subjects shall not interfere with required or back work. The remainder of his elective work must be offered from the agricultural subjects described on the following pages.

In selecting his course after the first year the student must obtain the advice and approval of a professor or an assistant professor preferably in the department in which he expects to specialize, who shall be chosen by the student at the beginning of the sophomore year. Students expecting to specialize in forestry, landscape art, rural education, or home economics must take as their advisers professors or assistant professors in those departments. All students who are preparing for teaching are recommended to consult the Professor of Rural Education as well as their Faculty Adviser before filing their term schedules.

## GRADUATED CREDIT

Beginning with the first term of 1916–17 the passing grades are designated A, B, C, D, and P. Beginning with the class of 1920 students receiving grade C are to receive normal credit toward graduation; grade B, 10 per cent additional credit; grade A, 20 per cent additional credit; grade D, credit reduced 10 per cent; and grade P, credit reduced 20 per cent. No student may be graduated in less than eight terms unless his work in the College of Agriculture averages 15 per cent excess credit.

---

‡Optional for students taking a major in home economics.

# DEPARTMENTS OF INSTRUCTION

## BOTANY

6. **Taxonomy of the Higher Plants.** Credit four hours. Prerequisite course 1 or its equivalent. Lecture by appointment. Roberts Hall 292. Laboratory, T Th, 2–5. Agronomy Building, Botanical Laboratory. Remainder of the work at times optional with the student. Professor WIEGAND and Mr. BECHTEL.

A study of the kinds of seed plants and ferns, their classification into genera families and orders, and field work on the local flora about Ithaca. Emphasis will be placed on wild plants, but the more common cultivated plants will receive some attention. The course is planned to follow course 1 and furnish an introduction to field botany and classification of the higher plants, in preparation for special work in various departments and in teaching. Instruction will be given in the preparation of an herbarium and of keys. Laboratory fee, $3.50; deposit to cover apparatus, $2.

6a. **Advanced Field Course in Taxonomy.** Credit four hours. Prerequisite course 6 or its equivalent. Laboratory and field work, W, 8–1, 2–5. Remainder of work at times optional with the student. Professor WIEGAND and Mr. BECHTEL.

An intensive study of the summer flora about Ithaca, with the consideration also of some advanced problems and methods in taxonomy. Laboratory fee, $3.50; deposit to cover apparatus, $2.

7. **Weeds and Weed Seeds.** Credit two hours. Prerequisite course 1 or its equivalent. Lecture and laboratory by appointment. Agronomy Building, Botanical Laboratory. Mr. BECHTEL.

This course is designed to meet the needs of students of agriculture who wish to obtain a working knowledge of weeds and weed seeds. It will also aid persons intending to teach nature study and agriculture in the schools. Laboratory fee, $1.50.

9. **Histology.** Credit four hours. Prerequisite course 1 or its equivalent. Lecture, F, 8. Laboratory, T Th, 8–10.30, F, 9–11.30. Agronomy Building, Botanical Laboratory. Assistant Professor EAMES.

This course is designed to give a working acquaintance with the internal morphology of vascular plants and with the terminology of cells, tissues, and organs. Emphasis is placed on practice in the interpretation and determination of material. To cover the range of variation in cells and tissues, a large amount of material is studied. Variation in form and structure is considered from the standpoint of phylogenetic development and adaptive modification. The course is of value especially to students of morphology, pathology, and plant physiology. Laboratory fee, $5.

18. **Research in General Botany, Histology, and Taxonomy.** Credit not less than three hours. Professor WIEGAND and Assistant Professor EAMES.

A course designed for graduates and advanced students. Original investigation by students who are adequately prepared. The laboratory fee depends on the nature of the work.

19. **Seminary in Taxonomy, Morphology, Cytology, and Histology.** Required of graduate students in the Department. Hours and place to be arranged. Professor WIEGAND and Assistant Professor EAMES.

Broad problems pertaining to botany will be discussed; literature will be reviewed; reports of research will be given.

20. **Plant Physiology.** Credit four hours. Prerequisite all freshman work or its equivalent including course 1. One lecture, one recitation, and five hours in laboratory. Time and place to be arranged. Mr. BENSON.

This course may be taken to satisfy the requirement in physiology. It is a general course in the physiology of plants. Particular emphasis is placed in both laboratory and recitation, on individual discussions of the principles taught and their applications. Laboratory fee, $4; breakage fee, $2.

21a. **Plant Physiology, Advanced Lecture Course.** Credit four hours. Prerequisite training in botany and chemistry, to be determined in each case by the instructor. Hours to be arranged. Agronomy Building 192. Assistant Professor CURTIS.

21b. **Plant Physiology, Advanced Laboratory Course.** Credit six hours. Prerequisite, as for course 21a. Laboratory, M T Th F, 10–1. Agronomy Building 21. Assistant Professor CURTIS and Mr. BENSON.

Topics include nutrition, osmotic pressure, permeability, absorption, conduction, transpiration, photosynthesis, metabolic products, digestion, translocation, respiration, fermentation, growth, stimulation, toxicity, reproduction, and plant response. Lectures and laboratory work are supplemented by written reports. Laboratory fee, $10; breakage deposit, $5.

Courses 21a and 21b are the equivalent of course 21, the credit for which is five hours a term in the first and second terms. These courses are designed primarily for advanced or graduate students, and particularly for those specializing in plant study. Students may take both 21a and 21b in the third term, or either may be taken alone.

[30. **Special Chapters in Metabolism.** Credit one hour. Open to graduates or to undergraduates who have had course 21 and organic chemistry. Lecture, F, 9. Agronomy Building 192. Professor KNUDSON.] Not given in 1918.

A study of some of the more important temporary and storage products of plant metabolism.

31. **Seminary in Plant Physiology.** Required of graduate students in plant physiology. Conference, hours to be arranged. Agronomy Building 192. Assistant Professor CURTIS.

Topics will be chosen from current work in plant physiology.

33. **Research, Plant Physiology.** Credit for major or minor, otherwise not less than four hours. Prerequisite training in botany, chemistry, and physiology. Agronomy Building 101. Assistant Professor CURTIS.

Problems in plant physiology and in the general relation of plant physiology to agriculture will be assigned for investigation. Reports or a thesis will be required. The amount of the laboratory fee is governed by the nature of the work.

## DRAWING

2a. **Free-hand Drawing and Outdoor Sketching.** Credit from two to five hours. Prerequisite course 2 or its equivalent. Students must register for not less than two hours. Lectures during practice. Practice by appointment, T W Th F, 8–1, T W Th, 2–5. Dairy Building 371. Professor BAKER.

While this course is intended primarily for students in landscape art—being out-of-door study, in pencil, pen and ink, and water color, of foliage, tree growth, and architecture—provision is also made for the general student and for teachers of drawing in the secondary schools.

## ENTOMOLOGY, LIMNOLOGY, AND NATURE-STUDY

2. **The Ecology of Insects.** Credit three hours. Lecture, W, 8. Roberts Hall 392. Practical exercises (largely field work), W, 10–12.30, and another period of two and a half hours by appointment. Professor NEEDHAM and Mr. LLOYD.

A general course in the study of the lives of insects in relation to their environment. Practical studies will be made of the activities of insects and of the rôle that they play in different natural associations. Observations will be made on the relations between their structures and instincts and the situations in which they live, and on many of the ways in which they find a living and establish homes. Laboratory fee, $2.50.

3. **General Entomology.** Credit three hours. Prerequisite course 1 or Zoology 1. Lectures, M W, 9. Practical exercises, W Th, 2–4.30. Roberts Hall 392. Assistant Professor MATHESON and Mr. ———.

Lectures on the characteristics of orders, suborders, and the more important families, and on the habits of representative species. The practical exercises include a study of the structure of insects and practice in their classification. The lectures only (credit two hours) are taken by those who have had courses 4 and 5. When possible the laboratory work will utilize materials collected by the student in the field. Laboratory fee, $1.50.

4. **Elementary Morphology of Insects.** Credit three hours. By appointment. Roberts Hall 391. Mr. YOUNG.

An introductory laboratory course. See note under course 5. Laboratory fee, $2.

5. **Elementary Systematic Entomology.** Credit two hours. Prerequisite course 4. Hours by appointment. Roberts Hall 391. Mr. YOUNG.

Laboratory fee, $2.

Courses 4 and 5 are introductory laboratory courses, required of all students who plan to take advanced work in entomology. The work is individual, and both courses may be taken in one term.

10. **Entomotaxy.** Credit two or three hours. Prerequisite course 4, should be accompanied by course 5. Laboratory and field work, W F, 2–5, and for three-hour students, Th or F, 10–1. Roberts Hall 301. Assistant Professor BRADLEY.

Methods of collecting insects and of preserving them for study and for the cabinet, together with other matters of technique. Practice in the identification of the insects of the local fauna. Two all-day field trips will be required.

19. **Research in Systematic Entomology.** Credit three or more hours. Prerequisite courses 3, 10, 11, 14, 20, and one term of course 12. Laboratory hours by arrangement. Roberts Hall 301. Assistant Professor BRADLEY, Professors NEEDHAM and JOHANNSEN.

29. **Research in Morphology of Insects.** Credit three or more hours. Prerequisite courses 3, 4, and 5. Laboratory open daily except S, 8–5; S, 8–1. Roberts Hall 391. Professor NEEDHAM.

Special work arranged with reference to the needs and attainments of each student. Laboratory fee, $1.50 a credit hour.

40. **Advanced Economic Entomology and Insectary Methods.** Credit three hours. Open only to graduates. Seminary, T, 2–4.30. Field and laboratory work by appointment. Insectary. Assistant Professor MATHESON.

Economic problems connected with applied entomology will be discussed and reported on, and field observations will be made. Experimental methods in breeding, photographing, investigating, and controlling insects will be discussed and studied. Designed for advanced students in entomology who desire to fit themselves for experiment station work. Laboratory fee, $2.50.

49. **Research in Economic Entomology.** Credit three or more hours. Prerequisite courses 3, 4, 5, 11, and 14. Laboratory and field work by appointment. Insectary. Professor HERRICK and Assistant Professor MATHESON.

In most cases it is impracticable to complete an investigation in this subject during the college year. Students must arrange to conduct their observations during the growing season.

50. **General Limnology.** Credit three hours. Open only to students who have taken or are taking course 3 and Biology 1, or the equivalent. Lecture, Th, 8. Roberts Hall 392. Laboratory, Th, 2–4.30, and another period of two and a half hours by appointment. Roberts Hall 492. Professor NEEDHAM and Mr. LLOYD.

An introduction to the study of the life of inland waters. Aquatic organisms in their qualitative, quantitative, seasonal, and ecological relations. Laboratory fee, $2.50.

59. **Research in Limnology.** Credit three or more hours. Prerequisite course 50 or its equivalent. Laboratory and field work by appointment. Roberts Hall 492 and Biological Field Station. Professors NEEDHAM and JOHANNSEN, and Assistant Professor EMBODY.

61. **Nature Study.** Third term, credit three hours. Lecture and field work to be arranged. Laboratory, W, 2.30–5. Insectary. Assistant Professor COMSTOCK and———.

This course gives laboratory and field practice with those subjects in plant and animal life that are best fitted for nature study in the elementary schools. Special attention is given to methods of study and manner of presentation, and also to the relation of the topics to agriculture. The work consists of conferences, field practice, and laboratory practice. The lectures discuss nature study as a part of elementary education, and methods of correlating nature study with other school work.

**Seminary.** M, 4.30–5.30. Roberts Hall 392.

The work of an entomological seminary is conducted by the Jugatæ, an entomological club which meets for the discussion of the results of investigations.

## FARM CROPS

These courses to be given in the summer of 1918 on the condition that five or more advanced students register for them.

2. **Farm Crops, Advanced Course.** Credit three hours. Prerequisite course 1. Lectures, M T W, 11. Poultry Building 175. Professor MONTGOMERY.

The object of this course is to study the more important principles of crop production, based on experimental evidence. Both cereal and forage crops are studied. An effort is made to acquaint the student with the best sources of literature, especially the work of experiment stations. About six hours of reference reading is required each week.

5. **Seminary.** Without credit. Required of graduate students. M, 4. Poultry Building. Professor MONTGOMERY.

6. **Research.** Credit two or more hours. Prerequisite permission to register. Limited to graduate students. Professor MONTGOMERY.

## FARM PRACTICE

1. **Farm Practice.** Without credit. Hour and place by appointment. Professor KING and Mr. ———.

An elective course designed to assist students in meeting the requirements in farm practice demanded by the College. In order to meet these requirements, students must have a practical knowledge of horses, cattle, sheep, swine, poultry, crops, farm machinery, orcharding, gardening, butter and cheese making, and the like. All men students except those whose record and registration at the beginning of the senior year show that they are specializing to the extent of fifteen hours in home economics, forestry, landscape art, or entomology, must fully satisfy, before the beginning of the senior year, the requirements in farm practice. The Department of Forestry requires three months of forestry practice in lieu of the farm practice requirement. All men students are required to report to the Department of Farm Practice as assigned within the first three weeks of their first term in the College.

## FLORICULTURE

3. **Commercial Floriculture.** Credit four hours. Prerequisite course 1 or commercial experience, and course 2. Lectures and recitations, M W F, 9. Practice, W, 2–4.30. Greenhouses. Assistant Professor LUMSDEN.

Studies in the propagation and culture of florists' crops. As far as possible practical work will be given in the propagation and culture of roses, carnations, violets, orchids, and other plants grown for commercial purposes. Methods of packing and shipping, and marketing will be considered. Laboratory fee, $2.

8. **Garden Flowers.** Credit three hours. Lectures, T Th, 9. Practice, T or Th, 2–4.30. Greenhouses and gardens. Assistant Professor LUMSDEN.

A study is made of the identification, propagation, and culture of annuals, herbaceous perennials, and roses in order to give the student an intimate knowl-

edge of the forms that may be used in garden planting either on home grounds or in public parks. An excellent collection of plant material is available for demonstration work in this course. All members of this class will be required to participate in an excursion to the Thompson estate at Canandaigua on August 15. Laboratory fee, $2.

8a. **Grouping and Arrangement of Annuals and Herbaceous Perennials.** Credit two hours. Prerequisite course 8 and Botany 1. Lecture, S, 9. Practice, S, 10–12.30. Greenhouses. Assistant Professor LUMSDEN.

A study of the principles and methods of arrangement of garden flowers in the border and the flower garden. The planting of borders for a continuous display of bloom throughout the season. Æsthetic taste in color arrangement will also be studied. Laboratory fee, $2.

9. **Amateur Floriculture.** Credit three hours. Lectures, W F, 9. Practice, M, 2–4.30. Greenhouses. Mr. THAYER.

The propagation and culture of potted plants in the home—plants suitable for window gardening and for outdoor home gardening. The course includes a study of containers, soils, fertilizers, and insecticides; also the preparation and planting of flower beds. It is planned primarily for students who are interested especially in home economics, but is open to any one desiring information regarding simple methods of plant culture. Laboratory fee, $2.

12. **Investigation in Floriculture.** Credit one, two, or three hours. Prerequisite courses 1, 3, and 4, and permission to register. Designed primarily for upperclassmen and graduate students. Consultation by appointment. Professor BEAL and Assistant Professor LUMSDEN.

The investigation of problems in growing flowers for cutting, exotics, garden flowers, and the like.

## FORESTRY

The first ten weeks of the summer term will be spent at Ithaca; the remainder of the term will be spent chiefly in a study of logging and milling operations in northern New York and in practice work in mensuration and silviculture.

The following courses of instruction will be offered:

Group A

| | |
|---|---|
| Forestry 9 | Forest Utilization |
| Forestry 11 | Forest Mensuration |
| Forestry 14 | Silviculture: Forest Ecology |
| Forestry 15 | Silviculture: Natural Reproduction and Care of the Forest |

Group B

| | |
|---|---|
| Forestry 20 | Forest Management: (a) Forest Organization |
| Forestry 22 | Seminary |
| Forestry 23 | Advanced Work |
| Forestry 24 | Research |

For the professional forestry students, the courses in Group A will constitute the first term's work of the senior year. During the following term, these stu-

dents are expected to obtain the required practical experience, returning to Ithaca to complete undergraduate work in the second term. Courses in Group B are offered for graduate students.

Courses 9, 11, 14, 15, and 20 are given for professional forestry students during the third, or summer, term only, because of the obvious advantages of the season and place of work.

Students should provide their own bedding and blankets for the trip, the expenses for which, including travel and subsistence, are estimated at from $60 to $75.

In the following program, the designated hours and rooms apply to work in Ithaca. A special field schedule is to be arranged.

9. **Forest Utilization.** Credit four hours. Lectures, M W F, 11. Forestry Building 126. Practice in logging camps and in mills the latter part of term. Assistant Professor BENTLEY.

Logging methods and equipment; logging in representative regions; manufacture of lumber; determination of stumpage values; timber sale contracts; timber sale administration, including marking, brush disposal, and scaling in practice; minor industries; the organization of the lumber industry; markets.

11. **Forest Mensuration.** Credit five hours. Lectures, M T W, 8. Forestry Building 126. Practice, M, 2–4.30. Forestry Building 118, and in special field work during the latter part of the term. Assistant Professor BENTLEY.

Measurement of logs and standing timber; timber cruising; study of the rate of growth of timber; volume and yield tables. Laboratory fee, $1.50.

14. **Silviculture: Forest Ecology.** First six weeks of term. Credit three hours. Open only to professional forestry students. Prerequisite course 13 and Botany 2 or its equivalent. Lectures, M T W Th F, 10. Forestry Building 122. Practice, W, 2–4.30, S, 8–1. Forestry Building 118. Professor SPRING.

The study of the forest as a society of trees; biological characteristics of trees and of stands in relation to the factors of site; influence of the forest on site; forest description. Laboratory fee, 50 cents.

15. **Silviculture: Natural Reproduction and Care of the Forest.** Beginning the seventh week of term. Credit three hours. Prerequisite courses 13 and 14. Lectures and practice to be arranged. Professor SPRING.

A technical discussion of the silvicultural methods of reproducing forests by natural seeding; the application of these in each of the forest regions of the United States; cleanings, improvement cuttings, and thinnings; marking timber. Laboratory fee, 50 cents.

20. **Forest Management: (a) Forest Organization.** Credit three hours. Open only to graduate students. Lectures, M W F, 9. Forestry Building 126. Professor SPRING.

Organizing a forest property for management. An important part of this course is a critical study of a working plan on a large forest tract in New York State; the course includes practice in forest engineering under direction of Assistant Professor BENTLEY, and field studies in forest administration.

22. **Seminary.** Credit two hours. Open only to graduate students. Hours to be arranged. Forestry Building 126. Professors HOSMER and SPRING, and Assistant Professor BENTLEY.

Field conferences on important phases of forestry.

23. **Advanced Work.** Credit two or more hours. Open to undergraduate and graduate students who have had the necessary training. Hours by appointment. Professors HOSMER and SPRING, and Assistant Professor BENTLEY.

Individual advanced study of designated topics.

24. **Research.** Credit three or more hours. Open only to graduate students who have had the necessary training. Hours by appointment. Professors HOSMER and SPRING, and Assistant Professor BENTLEY.

## LANDSCAPE ART

13. **Plant Materials.** Credit six hours. Open to general election, but intended for regular students in landscape art. Prerequisite Botany 1. Lectures, M W, 8. Practice and field trips, M F, 10–12.30 and 2–4.30. Landscape Art Building. Professor CURTIS.

A study of the characteristics and requirements of trees, shrubs, and vines for landscape planting, and a discussion of them as elements in landscape composition.

The work has been planned in consultation with the Departments of Drawing and Floriculture, so that a total registration of 16 hours may be made as follows: drawing 5 hours; floriculture, 5 hours; and landscape art, 6 hours. All of this instruction enters into the regular landscape art schedule and carries full term credit towards graduation. Laboratory fee, $1.50.

## PLANT BREEDING

1. **Genetics.** Credit four hours or, by special arrangement, three hours. Prerequisite Botany 1 and 20 or equivalents in zoology by permission. Lectures, T Th, 8. Forestry Building 210. Laboratory, T, 2–4.30. Forestry Building 212. One conference period. Forestry Building 212. Assistant Professor BARKER and Mr. FRASER.

A general introductory course and survey of the field of genetics, designed to acquaint the student with the laws of variation and heredity, their application to the improvement of plants and animals, and their bearing on eugenics. Laboratory studies in the collection and measurement of variations within certain species, in hybridization and selection, and in the laws of segregation and recombination. By special arrangement the course may be taken for three hours credit without the laboratory. Laboratory fee, $3.

## PLANT PATHOLOGY

1. **Plant Pathology.** Credit one, three, or four hours. Prerequisite Botany 1 and 20 or equivalents. Lecture, credit one hour, Th, 10. Roberts Hall 292. Must accompany or follow recitations and practice. Recitation and laboratory practice, credit three hours. Recitation, F, 12. Agronomy Building 192. Laboratory practice, W F, 2–4.30. Bailey Hall, West Basement. Professor WHETZEL and Assistant Professors GREGORY and HESLER.

A fundamental course treating of the nature, cause, and control of plant diseases, illustrated by studies of the commoner diseases of cultivated crops. Laboratory fee, $4.50; breakage deposit, $3.

2. **Principles of Plant Disease Control.** Credit three hours. Prerequisite course 1. Recitation, Th, 12. Home Economics Building 100. Laboratory practice, Th, 2–4.30, S, 10.30–1. Bailey Hall, West Basement. Professor WHETZEL and Assistant Professors GREGORY and HESLER.

A consideration of the principles and the methods of control of plant diseases. This will include studies on: exclusion by laws, regulations, quarantine, and inspection; eradication by pruning, seed selection, tree surgery, rotation, disinfection, and other means; protection by spraying, dusting, and wound dressing, and the like; immunization by selection, breeding, and feeding. Laboratory fee, $4.50; breakage deposit, $3.

20. **Research.** Credit not less than three hours. Professors WHETZEL and REDDICK, and Assistant Professors STEWART, GREGORY, and HESLER. Laboratory fee, $1.50 a credit hour; breakage deposit, $3.

## POMOLOGY

10. **Systematic Pomology.** Credit two hours. Prerequisite courses 1 and 8 and Botany 1. Lectures or recitations, T Th, 8. Roberts Hall 292. Several laboratory periods, S, 8–10.30, will be substituted for a corresponding number of lectures. Assistant Professor HEINICKE and Mr. ———.

A study of the botanical and physiological characteristics of all species of fruit-bearing plants, with special reference to their cultural requirements. The characteristic cultural methods of each fruit not discussed in a previous course are considered. Each student is required to collect and mount specimens of a number of varieties and species. Laboratory fee, $1.

13. **Pomology, Advanced Laboratory Course.** Credit one hour. Prerequisite courses 1, 8, 10, and 12, and permission to register. Hours and place to be arranged. Assistant Professor HEINICKE and Mr. ———.

This course is designed to give a more extended practice in the various nursery and orchard operations than can be given in course 1. It is intended for students doing their major work in pomology. Laboratory fee, $2.50.

19. **Research.** Credit one to three hours. Open to graduate or other students who have had courses 10, 12, and 13, Botany 1 and 20, Plant Pathology 1, Entomology 3, and Chemistry 1 and 30 or 32. Professor CHANDLER and Assistant Professor HEINICKE.

## POULTRY HUSBANDRY

1. **Poultry Husbandry.** Credit three hours. Not offered to a class of less than ten students. Lectures, T Th, 11. Poultry Building 375. Practice, T, 2–4.30. Poultry Building 325. Messrs. HEUSER and ———.

An introductory and prerequisite course for students desiring to take specialized courses in poultry husbandry. Those desiring a general course should see courses 2a, 3, 3a, and 10. The course includes the anatomy and physiology of poultry, the study of the egg, embryology, nomenclature, bibliography, environmental conditions, the history and scope of poultry husbandry.

2a. **Flock and Plant Management.** Credit one hour. Must be preceded or accompanied by course 2 or 10 and preferably also by Animal Husbandry 1.

Practice periods and extra time arranged by appointment. Practice, three short periods a day, including Sunday, for four weeks: morning, 7.45–8.30; noon, 12.45–1.15; night, 4.30–5. Poultry Building. Messrs. HEUSER and ANDREWS.

Record keeping, and management of fowls for egg production and for fattening, including preparation for market. Assigned reading and a written examination will be required.

3. **Incubator Practice.** Credit one hour. Must be preceded or accompanied by course 1a or 10. Practice periods and extra time arranged by appointment. Practice, three short periods a day, including Sunday, for four weeks: morning, 7.45–8.30; noon, 12.45–1.15; night, 4.30–5. Poultry Building. Messrs. ——— and ———.

Practice in operating incubators; testing eggs, keeping records, and taking apart and setting up machines. Assigned reading and a written examination will be required.

3a. **Brooder Practice.** Credit one hour. Must be preceded or accompanied by course 1a or 10. Practice period and extra time arranged by appointment. Practice, three short periods a day, including Sunday, for four weeks: morning, 7.45–8.30; noon, 12.45–1.15; night, 4.30–5. Poultry Building. Messrs. ——— and———.

The management of a brooder and a flock of chickens; the keeping of temperature, food, and growth records. Assigned reading and a written examination will be required.

7a. **Marketing Practice.** Credit one hour. Prerequisite course 7 and permission to register. Discussion hour, Th, 4.45–5.45. Poultry Building. Practice periods arranged by appointment. Poultry Building 100. Mr. MACOMBER.

This course is to accompany or supplement course 7 for those who desire additional instruction in the handling of poultry products and refrigeration machinery, and in general salesroom work.

10. **Farm Poultry.** Credit three hours. Not open to students who have taken any other course in poultry husbandry, except by special permission. Lectures, M W, 11. Poultry Building 375. Laboratory, W, 2–4.30. Poultry Building 300. Messrs. ——— and ———.

A brief course dealing with the practical application of the principles of poultry husbandry for persons who do not specialize in this subject.

12. **Research.** Credit one or more hours. Prerequisite course 8 and permission to register. Members of the departmental staff. Mr.———

An original investigation of a problem in poultry husbandry to be presented as a written thesis.

## RURAL EDUCATION

2. **Principles of Teaching.** Credit four hours. Open to juniors and seniors who have completed course 1 or its equivalent. Lectures, M T Th F, 8. Caldwell Hall 143. Professor STEWART.

Topics considered: the application of principles of educational psychology and the philosophy of education to the problems of school practice; the nature of study and its principal factors; the teacher's relation to the learning process,

motivation, psychological versus logical thinking, interest and attention, motor control; the problem and the project as basis for the organization of materials; the use of first-hand sensory materials; the selection and arrangement of subject matter; teaching methods, lecture, textbook, development, recitation; assignment of lessons, questioning, practice; and classroom management.

3. **Agriculture in the High School.** Credit three hours. Open to juniors and seniors who have completed courses 1 and 2 and who have met the farm practice requirements. Lectures, W S, 8. Laboratory, S, 9–11.30. Caldwell Hall 282. Professor WORKS.

A study of the purposes of vocational agriculture, organization and presentation of subject matter, textbooks, and home project and extension activities of the high school. A one-day excursion is a part of the course. Laboratory fee, $1.

10. **Principles of Method.** Credit three or four hours. Open only to graduate students who have had work in education. Lectures, M W F, 10. Caldwell Hall 282. Professor STEWART.

A detailed study of the principles underlying method with special reference to the teaching of vocational agriculture and home economics. Topics considered: the aims of education; education as essentially a dynamic process, illustrated in growth changes, heredity expressions, habit formation, play and manual activities, and in the expenditure of energy; the laws of learning, particularly those related to the organization of ideas; the function and structure of subject matter; the principles underlying various school practices, for instance the project; interest in relation to learning; the basis for the organization of knowledge; the tests of teaching methods; how we think.

20. **Administration and Supervision of Agricultural Education.** Credit two or three hours. Lectures, T Th, 10. Caldwell Hall 282. Professor WORKS.

This course treats: administrative phases of agricultural education of secondary and college grade; Federal acts relating to agricultural education; comparative study of types of schools of agriculture; state systems of supervision. Visits to schools in New York and adjacent States are a required part of the course.

## RURAL ENGINEERING

3. **Farm Mechanics.** Credit three hours. Lectures, T Th, 9. Caldwell Hall 100. Laboratory, W, 2–5. Professor H. W. RILEY.

A brief course intended for the general student who does not wish to devote to the study of machinery as much time as is required for courses 1 and 2. The main purpose of the instruction is to develop ability to think and to reason in terms of mechanical devices, the machines used for this purpose being plows, mowers, binders, pumps, water-supply systems, spray machinery, and internal combustion engines. Laboratory fee, $2.

19. **Research in Farm Mechanics.** Credit one or more hours. Prerequisite adequate ability and training for the work proposed and permission to register. Professor H. W. RILEY.

Special work in farm mechanics on problems under investigation by the Department or of special interest to the student, provided, in the latter case, that adequate facilities can be obtained.

20. **Farm Engineering.** Credit three hours. Prerequisite plane geometry. Students are urged to take Drawing 1 in preparation for this course. Lectures, T F, 10. Caldwell Hall 143. Practice, W, 2–5. Caldwell Hall 400. Mr. STRAHAN.

A study of the practical solution of the elementary problems involved in connection with surveying and mapping the farm. Leveling for farm drainage, laying out building foundations and water supply. From the data obtained in the field a contour map will be drawn of one of the fields near the College. Farm sanitation and sewage disposal. Attention is also given to concrete construction, the design of simple concrete structures and estimates of their cost. Laboratory fee, $2.

30. **Farm Structures.** Credit three hours. Prerequisite Drawing 1 or its equivalent. Lecture, T, 12. Caldwell Hall 143. Drafting periods, two by appointment. Caldwell Hall 400. Mr. STRAHAN.

A study of the principles of design, including lighting, ventilation, sanitation, equipment, floor spacing, and construction, for barns, stables, and other farm buildings, and their application in practice. Laboratory fee, $1.

## VEGETABLE GARDENING

2. **Commercial Vegetable Gardening.** Credit four hours. Not given unless five or more students register. Prerequisite course 1 and Botany 1; must be preceded or accompanied by Soils 1. Lectures, M W F, 11. Poultry Building 325. Practice, T, 2–4.30. Poultry Building 350, vegetable greenhouses, and gardens. Assistant Professor KIRKPATRICK.

The principles of vegetable growing as applied in commercial production: choice of location, equipment, management, culture, special requirements, varieties, enemies, marketing, and profits. The laboratory work includes exercises in growing plants under glass, and in the planting and care of early outdoor vegetables. Each student assumes full charge of his own plantings, carrying them through to the end of the term. A one-day trip to visit market gardens is required near the end of the term. Cost about $5. Laboratory fee, $2.

3. **Commercial Vegetable Gardening.** Credit three hours. Not given unless five or more students register. Prerequisite course 2, Botany 1, and Soils 1. Lecture, T, 8. Practice, T Th, 10–1. Poultry Building 325. Assistant Professor KIRKPATRICK.

The lectures are devoted to principles of market garden crop production and management based on experimental evidence available. Two to three hours per week reference reading will be required aside from reports in connection with laboratory work. The laboratory work is a continuation of that started in course 2: practice in care, harvesting, and marketing of produce. Study will be made of records on truck farm and of market garden management. Short trips to neighboring market gardens and a two days' trip to one or more of the most important market garden centers in the State will be required. Cost $12 to $15. Exact date to be arranged. Laboratory fee, $2.

5. **Vegetable Crops.** Credit three hours. Prerequisite permission to register; must be preceded or accompanied by course 2. Lecture, T, 9. Poultry

Building 325. Laboratory, Th F, 2–4.30. Vegetable gardens at East Ithaca. Mr. KENERSON.

The lecture will deal with the botany, history, and origin of the vegetable crops, as well as types and varieties. Judging, scoring, and exhibition will be given in detail. Laboratories will consist of descriptive studies of the main varieties and practice in judging and exhibition. Laboratory fee, $2.

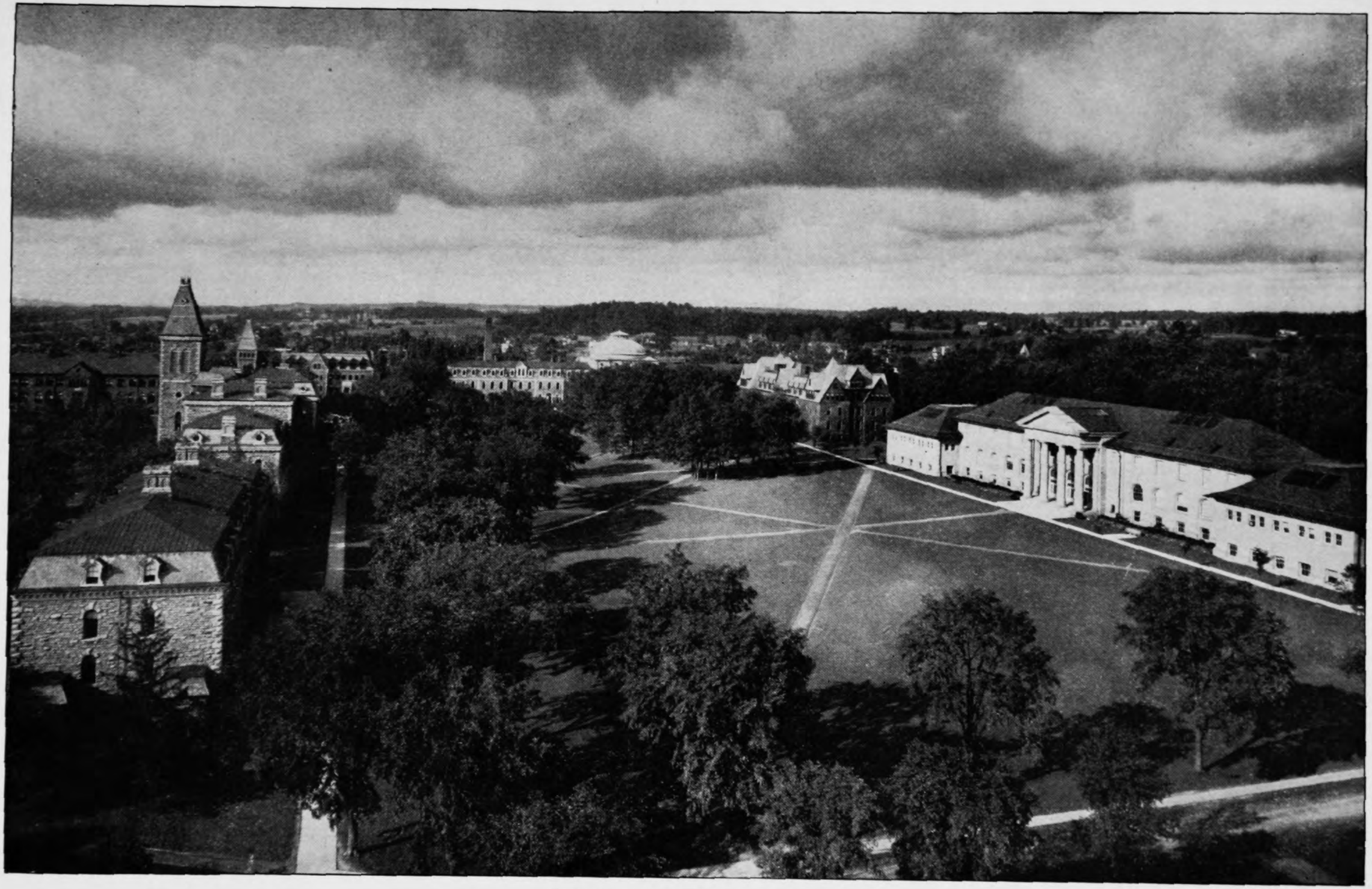
Correspondence concerning the publication of Cornell University should be addressed to the Secretary of Cornell University, Ithaca, New York.

This publication is issued at Ithaca, New York, monthly from July to November inclusive, and semi-monthly from December to June inclusive.

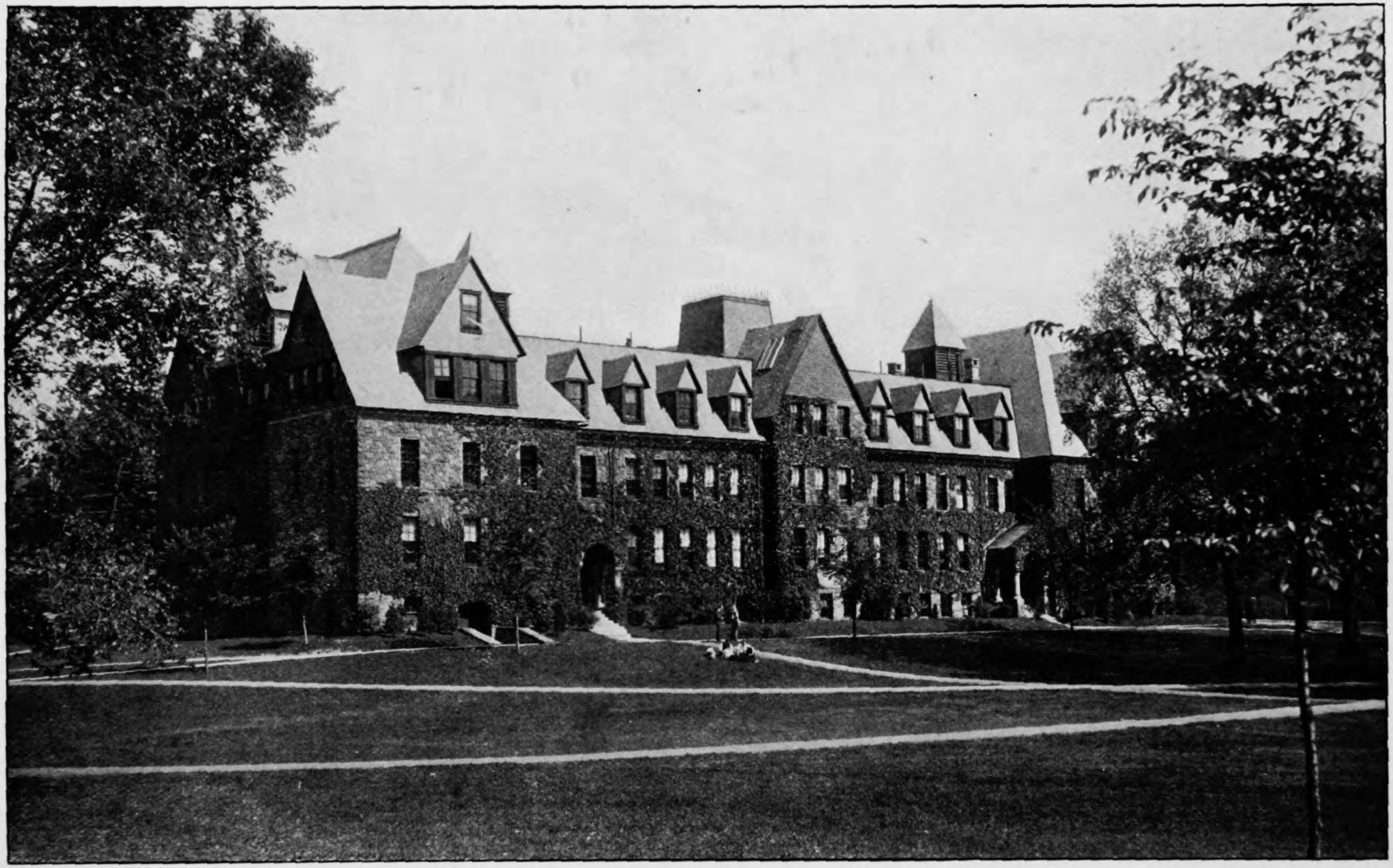
[Entered as second-class matter, December 14, 1916, at the post office at Ithaca, New York, under the act of August 24, 1912.]

The Annual Register (for the year 1917–18, published January 1, 1918), price 50 cents.
Book of Views, price 25 cents.
Directory of Faculty and Students, Second Term, 1917–18, 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 edition of each is given after the title.
General Circular of Information for Prospective Students, December 15, 1917.
Announcement of the College of Arts and Sciences, March 15, 1917.
Announcement of Sibley College of Mechanical Engineering and the Mechanic Arts, February 1, 1918.
Announcement of the College of Civil Engineering, April 15, 1917.
Announcement of the College of Law, May 15, 1917.
Announcement of the College of Architecture, July 1, 1917.
Announcement of the New York State College of Agriculture, June 1, 1917.
Announcement of the Winter Courses in the College of Agriculture, June 15, 1917.
Announcement of the Summer Term in Agriculture, March 15, 1918.
Announcement of Instruction in Wild Life Conservation and Game Breeding, January 15, 1918.
Announcement of the New York State Veterinary College, May 1, 1917.
Announcement of the Graduate School, February 15, 1917.
Announcement of the Summer Session, March 1, 1918.
Annual Report of the President, September 1, 1917.
Pamphlet on prizes, August 1, 1917.
Samples of entrance and scholarship examination papers, December 1, 1917.

Announcement of the Medical College may be procured by writing to the Cornell University Medical College, Ithaca, N. Y.



VIEW OF QUADRANGLE
SHOWING LINCOLN HALL IN RIGHT CENTER



LINCOLN HALL