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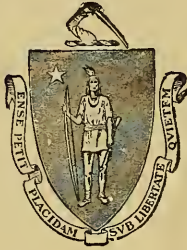
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The M. A. C. Bulletin

Amherst, Mass.

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# THE M. A. C. BULLETIN

## AMHERST, MASS.

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For January, 1915

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No. 31

### CATALOGUE

OF THE

## MASSACHUSETTS

### AGRICULTURAL COLLEGE,

1914-1915.

FIFTY-SECOND ANNUAL REPORT.  
PART II.



BOSTON:  
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,  
32 DERNE STREET.  
1915.



Without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life. — *Act of Congress, July 2, 1862.*

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# MASSACHUSETTS AGRICULTURAL COLLEGE, AMHERST.

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CATALOGUE, 1914-1915.

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BOSTON:  
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,  
32 DERNE STREET.  
1915.

APPROVED BY  
THE STATE BOARD OF PUBLICATION.



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THE MASSACHUSETTS  
AGRICULTURAL COLLEGE.

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This issue of the catalogue represents the status of the college for the current college year, with provisional announcement of courses of study and other matters for the year to follow. Additional announcements are made in a supplementary bulletin, published in the spring.

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The college reserves, for itself and its departments, the right to withdraw or change the announcements made in its catalogue. Special publication will be made should it become necessary on account of important changes.

# CALENDAR.

1915-16.

## REGULAR COURSES.

### 1915.

January 4, Monday, 1 P.M., . . . . .	Winter recess ends; regular schedule of classes.
January 22, Friday, 8 A.M., . . . . .	Semester examinations begin.
February 1, Monday, 1 P.M., . . . . .	Second semester begins; regular schedule of classes.
February 22, Monday forenoon, . . . . .	Half holiday, Washington's Birthday.
March 26, Friday, 5 P.M., . . . . .	Spring recess begins.
April 5, Monday, 1 P.M., . . . . .	Spring recess ends; regular schedule of classes.
April 19, Monday forenoon, . . . . .	Half holiday, Patriots' Day.
May 31, Monday, . . . . .	Holiday, observance of Memorial Day.
June 1, Tuesday, 8 A.M., . . . . .	Senior and junior examinations begin.
June 5, Saturday, 8 A.M., . . . . .	Sophomore and freshman examinations begin.
June 12-16, Saturday-Wednesday, . . . . .	Commencement.
June 17-19, Thursday-Saturday, . . . . .	Entrance examinations.
September 8-11, Wednesday-Saturday, . . . . .	Entrance examinations.
September 15, Wednesday, 1.30 P.M., . . . . .	First semester begins; chapel.
October 12, Tuesday forenoon, . . . . .	Half holiday, Columbus Day.
November 24, Wednesday, 12 M., . . . . .	Thanksgiving recess begins.
November 29, Monday, 1 P.M., . . . . .	Thanksgiving recess ends; regular schedule of classes.
December 17, Friday, 5 P.M., . . . . .	Winter recess begins.

### 1916.

January 3, Monday, 1 P.M., . . . . .	Winter recess ends; regular schedule of classes.
January 28, Friday, 8 A.M., . . . . .	Semester examinations begin.
February 7, Monday, 1 P.M., . . . . .	Second semester begins; regular schedule of classes.
February 22, Tuesday forenoon, . . . . .	Half holiday, Washington's Birthday.
March 24, Friday, 5 P.M., . . . . .	Spring recess begins.
April 3, Monday, 1 P.M., . . . . .	Spring recess ends; regular schedule of classes.
April 19, Wednesday forenoon, . . . . .	Half holiday, Patriots' Day.
May 30, Tuesday, . . . . .	Holiday, Memorial Day.
June 5, Monday, 8 A.M., . . . . .	Senior and junior examinations begin.
June 10, Saturday, 8 A.M., . . . . .	Sophomore and freshman examinations begin.
June 17-21, Saturday-Wednesday, . . . . .	Commencement.
June 22-24, Thursday-Saturday, . . . . .	Entrance examinations.



## MASSACHUSETTS AGRICULTURAL COLLEGE.

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**HISTORY.** — The Massachusetts Agricultural College was among the first of those organized under the national land grant act of 1862. This act granted public lands to the several States and Territories, the funds realized from the sale of which should be used to establish colleges of agriculture and mechanic arts; the bill was framed by the late Senator Justin Smith Morrill of Vermont. The Legislature of Massachusetts has granted money for the erection of nearly all the buildings now on the grounds, and makes annual appropriations for the maintenance of the college.

The college was incorporated in 1863, and on the 2d of October, 1867, was formally opened to its first class of students. At that time four buildings had been erected, and there were four regular instructors employed by the institution. In 1882 the State located its agricultural experiment station on the grounds of the college. Later, after the federal law was passed granting financial aid to experiment stations, the Massachusetts Agricultural Experiment Station was consolidated with the federal station, and subsequently the whole was incorporated with the college.

**COURSES.** — The college offers an education without tuition fee to any student who is a resident of Massachusetts and who meets the requirements for admission. Women are admitted on the same basis as are men. Students who are not residents of Massachusetts are required to pay a nominal tuition fee. The four-years<sup>1</sup> course leads to the degree of bachelor of science, and the graduate school offers advanced courses leading to the degrees of master of science, doctor of philosophy and master of agriculture. The winter school of ten weeks, for admission to which no scholastic requirements are made, is held each winter, beginning early in January. There are other short courses at the college, such as the beekeepers' course and summer school. Various forms of extension teaching are carried on away from the college, such as correspondence courses, traveling schools, educational exhibits, lecture courses, demonstrations, and circulating libraries.

**PURPOSE OF THE COLLEGE.** — The chief purpose of the college is to prepare men and women for the agricultural vocations. In this statement the term "agricultural vocations" is used in its broadest sense. Courses are offered which give efficient training in various agricultural pursuits, such as general farming, dairying, management of estates, poultry husbandry, fruit growing, market gardening, landscape gardening and forestry. Students are also fitted for positions in institutions designed for investigation in many sciences underlying the great agricultural industry, for teaching in agricultural col-

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<sup>1</sup> Twenty-seven teaching departments offer instruction in agriculture, horticulture, sciences, the humanities and rural social science. A system of major courses permits a student to elect major work in 1 of 15 departments, specializing in that and allied subjects for a period of two years.

leges and high schools, for scientific experts in chemistry, entomology, botany and microbiology and for business operations having connection with practical agriculture.

Though the agricultural vocations are thus the chief concern of the college, students also find the course one that fits them admirably for pursuits in which the sciences, particularly chemistry, botany and zoölogy, are an essential preparation. Still other students find the course a desirable education, without regard to future occupation. The course of study is designed to give a student a general college education, and in addition to make it possible for him to specialize in any department in which a major course is offered.

LOCATION AND EQUIPMENT. — The agricultural college is located in the town of Amherst. The grounds comprise more than 600 acres, lying about a mile north of the village center. The equipment of the college, both in buildings and facilities for instruction, is excellent. Amherst is about 98 miles from Boston, and may be reached over the Central Massachusetts division of the Boston & Maine Railroad, or by way of the Central Vermont Railroad. Electric car lines connect Amherst with Northampton, Holyoke and Springfield.

## THE MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

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Massachusetts provided for the establishment of an agricultural experiment station in 1882. This station, though on the college grounds and supported by the State, was then without organic connection with the college. Under an act of Congress, passed in 1887, an agricultural experiment station was established as a department of the college, and was supported by the general government. For a time, therefore, Massachusetts had two experiment stations at the college. In 1894 these were combined, and the station reorganized as a department of the college. It is now supported by funds from both the State and the general government. In 1906 the general government largely increased its support of experiment stations, on condition, however, that the money thus provided should be used only for research. The station now receives about one-third of its support from the State.

The station is under the direct supervision of the Board of Trustees. The chief officer is the director, who is responsible to the president and to a committee of the Board. The station is organized into a number of departments, all co-operating toward the betterment of agriculture. In most cases the heads of the station departments are heads of corresponding departments in the college. The work of the station takes three directions; namely, control work, experimentation and investigation. The station publishes numerous bulletins and two annual reports, one scientific, the other for practical farmers and for general distribution. These publications, conveying information as to results of experiments, are free, and circulate extensively, the mailing list containing some 20,000 addresses.

## THE CORPORATION.

### MEMBERS OF THE CORPORATION.

	TERM EXPIRES
NATHANIEL I. BOWDITCH of Framingham, . . . . .	1915
WILLIAM WHEELER of Concord, . . . . .	1915
ARTHUR G. POLLARD of Lowell, . . . . .	1916
CHARLES A. GLEASON of New Braintree, . . . . .	1916
FRANK GERRETT of Greenfield, . . . . .	1917
HAROLD L. FROST of Arlington, . . . . .	1917
CHARLES H. PRESTON of Danvers, . . . . .	1918
FRANK A. HOSMER of Amherst, . . . . .	1918
DAVIS R. DEWEY of Cambridge, . . . . .	1919
GEORGE P. O'DONNELL of Northampton, . . . . .	1919
WILLIAM H. BOWKER of Concord, . . . . .	1920
GEORGE H. ELLIS of West Newton, . . . . .	1920
ELMER D. HOWE of Marlborough, . . . . .	1921
EDMUND MORTIMER of Grafton, . . . . .	1921

### MEMBERS EX OFFICIO.

His Excellency Governor DAVID I. WALSH, *President of the Corporation.*

KENYON L. BUTTERFIELD, *President of the College.*

DAVID SNEDDEN, *State Commissioner of Education.*

WILFRID WHEELER, *Secretary of the State Board of Agriculture.*

### OFFICERS OF THE CORPORATION.

His Excellency Governor DAVID I. WALSH of Boston, *President.*

CHARLES A. GLEASON of New Braintree, *Vice-President.*

WILFRID WHEELER of Concord, *Secretary.*

FRED C. KENNEY of Amherst, *Treasurer.*

CHARLES A. GLEASON of New Braintree, *Auditor.*

### STANDING COMMITTEES OF THE CORPORATION.<sup>1</sup>

#### *Committee on Finance.*

CHARLES A. GLEASON, *Chairman.*  
 GEORGE H. ELLIS.  
 NATHANIEL I. BOWDITCH.

ARTHUR G. POLLARD.  
 FRANK A. HOSMER.  
 EDMUND MORTIMER.

#### *Committee on Course of Study and Faculty.*

WILLIAM WHEELER, *Chairman.*  
 WILLIAM H. BOWKER.  
 FRANK A. HOSMER.

DAVID SNEDDEN.  
 ELMER D. HOWE.  
 DAVIS R. DEWEY.

GEORGE P. O'DONNELL.

#### *Committee on Farm.*

NATHANIEL I. BOWDITCH, *Chairman.*  
 FRANK GERRETT.

CHARLES A. GLEASON.  
 GEORGE H. ELLIS.

<sup>1</sup> The president of the college is ex officio member and secretary of standing committees.



*Committee on Horticulture.*

HAROLD L. FROST, *Chairman.*  
DAVIS R. DEWEY.

ELMER D. HOWE.  
WILFRID WHEELER.

*Committee on Experiment Department.*<sup>1</sup>

CHARLES H. PRESTON, *Chairman.*  
WILFRID WHEELER.

ARTHUR G. POLLARD.  
HAROLD L. FROST.

EDMUND MORTIMER.

*Committee on Buildings and Arrangement of Grounds.*

WILLIAM H. BOWKER, *Chairman.*  
WILLIAM WHEELER.

FRANK GERRETT.  
CHARLES H. PRESTON.

GEORGE P. O'DONNELL.

*Committee on Extension Service.*

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GEORGE H. ELLIS.  
HAROLD L. FROST.

FRANK GERRETT.  
WILFRID WHEELER.  
EDMUND MORTIMER.

*Examining Committee of Overseers from the State Board of Agriculture.*

JOHN BURSLEY of West Barnstable.  
FRANK P. NEWKIRK of Easthampton.  
WILLIAM E. PATRICK of Warren.  
JOHN J. ERWIN of Wayland.  
R. HENRY RACE of North Egremont.

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<sup>1</sup> The director of the experiment station is a member of the committee on experiment department, without vote.

## OFFICERS OF THE INSTITUTION.

[The names of the faculty are arranged in groups according to rank. Within these groups, the order depends upon seniority of service in the college, not upon seniority of appointment to the position now held.]

### THE FACULTY.

KENYON L. BUTTERFIELD, A.M., LL.D., President of the College and Head of Division of Rural Social Science.	President's House.
GEORGE F. MILLS, <sup>1</sup> A.M., Dean Emeritus.	21 Main Street.
CHARLES H. FERNALD, Ph.D., Honorary Director of the Graduate School.	3 Hallock Street.
EDWARD M. LEWIS, A.M., Dean of the College and Professor of Languages and Literature.	19 Lincoln Avenue.
FRED C. KENNEY, Treasurer of the College.	Mount Pleasant.
WILLIAM P. BROOKS, Ph.D., Director of the Experiment Station and Lecturer on Soil Fertility.	6 Farview Way.
WILLIAM D. HURD, M.Agr., Director of the Extension Service and Supervisor of Short Courses.	46 Amity Street.
CHARLES E. MARSHALL, Ph.D., Director of the Graduate School and Professor of Microbiology.	Sunset Avenue.
FRANK A. WAUGH, M.Sc., Head of Division of Horticulture and Professor of Landscape Gardening.	Campus.
JAMES A. FOORD, M.Sc.Agr., Head of Division of Agriculture and Professor of Farm Administration.	Lincoln Avenue.
ROBERT J. SPRAGUE, Ph.D., Head of Division of the Humanities and Professor of Economics and Sociology.	Mount Pleasant.
JOSEPH B. LINDSEY, Ph.D., Goessmann Professor of Chemistry.	47 Lincoln Avenue.
CHARLES WELLINGTON, Ph.D., Professor of Chemistry.	34 Amity Street.
JAMES B. PAIGE, B.Sc., D.V.S., Professor of Veterinary Science.	42 Lincoln Avenue.
GEORGE E. STONE, <sup>2</sup> Ph.D., Professor of Botany.	Mount Pleasant.
PHILIP B. HASBROUCK, B.Sc., Professor of Physics and Registrar of the College.	130 Pleasant Street.
JOHN E. OSTRANDER, A.M., C.E., Professor of Mathematics and Civil Engineering.	33 North Prospect Street.
HENRY T. FERNALD, Ph.D., Professor of Entomology, Chairman of Division of Science.	44 Amity Street.
GEORGE C. MARTIN, C.E., Captain 18th U. S. Infantry, Professor of Military Science and Tactics.	Amherst House.
WILLIAM R. HART, A.M., L.B., Professor of Agricultural Education.	97 Pleasant Street.
FRED C. SEARS, M.Sc., Professor of Pomology.	Mount Pleasant.

<sup>1</sup> Dean Mills died Oct. 27, 1914.

<sup>2</sup> On leave of absence; Associate Professor Osmun acting as head of Department of Botany.

JOSEPH S. CHAMBERLAIN, Ph.D., Professor of Organic and Agricultural Chemistry.	Mount Pleasant.
WILLIAM P. B. LOCKWOOD, M.Sc., Professor of Dairying.	7 East Pleasant Street.
JOHN C. GRAHAM, B.Sc.Agr., Professor of Poultry Husbandry.	Lincoln Avenue.
WILLIAM D. CLARK, A.B., M.F., Professor of Forestry.	3 Mount Pleasant.
SIDNEY B. HASKELL, B.Sc., Associate Professor of Agronomy.	North Amherst.
A. VINCENT OSMUN, M.Sc., Associate Professor of Botany.	5 Kendrick Place.
CLARENCE E. GORDON, Ph.D., Associate Professor of Zoology and Geology.	38 Lincoln Avenue.
ROBERT W. NEAL, A.M., Associate Professor of English.	8 Woodside Avenue.
ALEXANDER E. CANCE, Ph.D., Associate Professor of Agricultural Economics and Supervisor of Agricultural Surveys.	9 Fearing Street.
Associate Professor of Rural Sociology.	—
BURTON N. GATES, Ph.D., Associate Professor of Beekeeping.	42 Lincoln Avenue.
JOHN A. MCLEAN, A.B., B.Sc.Agr., Associate Professor of Animal Husbandry.	Lincoln Block.
G. CHESTER CRAMPTON, Ph.D., Associate Professor of Entomology.	86 Pleasant Street.
CHARLES A. PETERS, Ph.D., Associate Professor of Inorganic and Soil Chemistry.	South Sunset Avenue.
GEORGE E. GAGE, Ph.D., Associate Professor of Animal Pathology.	27 Sunset Avenue.
CURRY S. HICKS, B.Pd., Associate Professor of Physical Education and Hygiene.	8 Allen Street.
ERNEST ANDERSON, Ph.D., Associate Professor of General and Physical Chemistry.	3 Phillips Street.
F. H. HESSELINK VAN SUCHTELEN, Ph.D., Associate Professor of Microbiology.	73 Pleasant Street.
ARNO H. NEHLING, Associate Professor of Floriculture.	24 Pleasant Street.
CHRISTIAN I. GUNNESS, B.Sc., Associate Professor of Rural Engineering.	4 Chestnut Street.
EDGAR L. ASHLEY, A.M., Assistant Professor of German.	24 Pleasant Street.
ALEXANDER A. MACKIMMIE, A.M., Assistant Professor of French.	North Amherst.
RALPH J. WATTS, B.Sc., Secretary of the College.	10 Nutting Avenue.
CHARLES R. GREEN, B.Agr., Librarian.	Mount Pleasant.
C. ROBERT DUNCAN, B.Sc., C.E., Assistant Professor of Mathematics.	31 North Prospect Street.
ARTHUR K. HARRISON, Assistant Professor of Landscape Gardening.	8 Allen Street.
ELVIN L. QUAIPE, B.Sc.Agr., Assistant Professor of Animal Husbandry.	4 Nutting Avenue.
WILLIAM L. MACHMER, A.M., M.E., Assistant Professor of Mathematics.	3 Kendrick Place.
HENRY E. SMITH, A.M., Assistant Professor of English.	24 Pleasant Street.
WALTER W. CHENOWETH, A.B., M.Sc., Assistant Professor of Pomology.	North Amherst.
ELMER E. McDONALD, B.Sc., Assistant Professor of Agronomy.	24 Pleasant Street.
HAROLD E. ROBBINS, B.Sc., A.M., Assistant Professor of Physics.	12 Nutting Avenue.

FRANK W. RANE, M.F.,	Boston.
Lecturer in Forestry.	
HELENA T. GOESSMANN, M.Ph.,	13 Main Street.
Instructor in English.	
WILLIAM L. HARMOUNT, A.B.,	86 Pleasant Street.
Instructor in French.	
ARTHUR N. JULIAN, A.B.,	Farview Way.
Instructor in German.	
FREDERICK A. McLAUGHLIN, B.Sc.,	Clark Hall.
Instructor in Botany.	
SAMUEL COONS,	56 Pleasant Street.
Instructor in Dairying.	
WALTER E. PRINCE, Ph.B., A.M.,	25 Pleasant Street.
Instructor in English and Public Speaking.	
ROBERT H. BOGUE, B.Sc.,	North Amherst.
Instructor in Chemistry.	
_____	_____
Instructor in Market Gardening.	
FRANK N. BLANCHARD, A.B.,	31 North Prospect Street.
Instructor in Zoölogy and Geology.	
LOYAL F. PAYNE, B.Sc.,	5 School Street.
Instructor in Poultry Husbandry.	
FRANK P. RAND, A.B.,	24 Pleasant Street.
Instructor in English.	
RAYMOND G. SMITH, B.Sc.,	Clark Hall.
Assistant in Botany.	
WILLIAM J. FITZMAURICE,	_____
Assistant in Physical Education.	
HAROLD M. GORE, B.Sc.,	8 Allen Street.
Assistant in Physical Education.	
BURT A. HAZELTINE, B.Sc.,	4 North Prospect Street.
Assistant in Mathematics.	
HAROLD E. BALDINGER, B.Sc.,	2 McClellan Street.
Assistant in Dairying.	
WILLIAM S. REGAN, B.Sc.,	6 Allen Street.
Assistant in Entomology.	

## GRADUATE ASSISTANTS.

ROY C. AVERY, <sup>2</sup> B.Sc.,	17 Phillips Street.
Department of Microbiology.	
CHARLES G. BAIRD, A.M.,	31 North Prospect Street.
Department of Rural Sociology.	
ERNEST L. DAVIES, <sup>3</sup> B.Sc.,	75 Pleasant Street.
Department of Microbiology.	
FRANKLIN C. GURLEY, B.Sc.,	81 Pleasant Street.
Department of Chemistry.	
ARAO ITANO, B.Sc.,	73 Pleasant Street.
Department of Microbiology.	
RUSSELL F. LUND, A.B.,	Pine Heights.
Department of Rural Sociology.	
JAMES F. MARTIN, M.Sc.,	19 South East Street.
Department of Entomology.	
FREDERICK G. MERKLE, B.Sc.,	East Street.
Department of Agronomy.	
STUART P. MILLER, B.Sc.,	81 Pleasant Street.
Department of Chemistry.	
CARL F. OBERHELMAN, B.Sc.,	81 Pleasant Street.
Department of Landscape Gardening.	
HAROLD A. ROBINSON, B.Sc.,	6 Allen Street.
Department of Chemistry.	

<sup>1</sup> Position filled temporarily by Mr. Harold F. Tompson.<sup>2</sup> From Nov. 14, 1914.<sup>3</sup> Resigned, to take effect Nov. 14, 1914.

PAUL SEREX, Jr., B.Sc., Department of Chemistry.	Chemical Laboratory.
CARL J. STRAND, A.M., Department of Agricultural Economics.	75 Pleasant Street.
ARTHUR S. THURSTON, B.Sc., Department of Floriculture.	92 Pleasant Street.
WARREN F. WHITTIER, A.B., Department of Animal Husbandry.	Mount Pleasant.

## THE EXPERIMENT STATION STAFF.

## ADMINISTRATION.

WILLIAM P. BROOKS, Ph.D., Director.	6 Farview Way.
JOSEPH B. LINDSEY, Ph.D., Vice-Director.	47 Lincoln Avenue.
FRED C. KENNEY, Treasurer.	Mount Pleasant.
CHARLES R. GREEN, B.Agr., Librarian.	Mount Pleasant.

## DEPARTMENT OF AGRICULTURE.

WILLIAM P. BROOKS, Ph.D., Agriculturist.	6 Farview Way.
HENRY J. FRANKLIN, Ph.D., In charge of Cranberry Investigation.	Wareham.
EDWIN F. GASKILL, B.Sc., Assistant Agriculturist.	North Pleasant Street.

## DEPARTMENT OF BOTANY AND VEGETABLE PATHOLOGY.

GEORGE E. STONE, <sup>1</sup> Ph.D., Botanist and Plant Pathologist.	Mount Pleasant.
GEORGE H. CHAPMAN, M.Sc., Assistant Botanist.	13 Fearing Street.
ORTON L. CLARK, B.Sc., Assistant Botanist.	Mount Pleasant.

## DEPARTMENT OF ENTOMOLOGY.

HENRY T. FERNALD, Ph.D., Entomologist.	44 Amity Street.
BURTON N. GATES, Ph.D., Aparist.	42 Lincoln Avenue.
ARTHUR I. BOURNE, A.B., Assistant Entomologist.	12 East Pleasant Street.

## DEPARTMENT OF PLANT AND ANIMAL CHEMISTRY.

JOSEPH B. LINDSEY, Ph.D., Chemist.	47 Lincoln Avenue.
EDWARD B. HOLLAND, M.Sc., Associate Chemist, in charge of Research Division.	28 North Prospect Street.
FRED W. MORSE, M.Sc., Research Chemist.	40 Pleasant Street.
HENRI D. HASKINS, B.Sc., In charge of Fertilizer Division.	14 Amity Street.
PHILIP H. SMITH, M.Sc., In charge of Feed and Dairy Division.	102 Main Street.
LEWELL S. WALKER, B.Sc., Assistant.	19 Phillips Street.
RUDOLPH W. RUPRECHT, M.Sc., Assistant.	32 North Prospect Street.

<sup>1</sup> On leave of absence; Associate Professor Osmun acting as head of Department of Botany.

CARLTON P. JONES, M.Sc., Assistant.	30 North Prospect Street.
CARLOS L. BEALS, B.Sc., Assistant.	Sunderland.
WALTER S. FROST, B.Sc., Assistant.	24 Pleasant Street.
JAMES P. BUCKLEY, Jr., Assistant.	29 Lincoln Avenue.
JAMES T. HOWARD, Collector.	154 Main Street.
HARRY L. ALLEN, Assistant.	89 Main Street.
JAMES R. ALCOCK, Assistant.	North Amherst.

## DEPARTMENT OF HORTICULTURE.

FRANK A. WAUGH, M.Sc., Horticulturist.	Campus.
FRED C. SEARS, M.Sc., Pomologist.	Mount Pleasant.
JACOB K. SHAW, Ph.D., Research Pomologist.	1 Allen Street.
JOHN B. NORTON, B.Sc., Graduate Assistant.	84 Pleasant Street.

## DEPARTMENT OF METEOROLOGY.

JOHN E. OSTRANDER, A.M., C.E., Meteorologist.	33 North Prospect Street.
--	---------------------------

## DEPARTMENT OF POULTRY HUSBANDRY.

JOHN C. GRAHAM, B.Sc.Agr., In charge of Department.	Lincoln Avenue.
HUBERT D. GOODALE, Ph.D., Research Biologist.	North Amherst.

## DEPARTMENT OF VETERINARY SCIENCE.

JAMES B. PAIGE, B.Sc., D.V.S., Veterinarian.	42 Lincoln Avenue.
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## THE EXTENSION SERVICE STAFF.

WILLIAM D. HURD, M.Agr., Director of the Extension Service and Supervisor of Short Courses.	46 Amity Street.
EARNEST D. WAID, B.Sc.Agr., Assistant Director.	61 Amity Street.
ORION A. MORTON, Extension Professor of Agricultural Education.	Lincoln Avenue.
EZRA L. MORGAN, A.M., Extension Professor of Community Planning.	2 Allen Street.
LAURA COMSTOCK, Extension Professor of Home Economics.	84 Pleasant Street.
RICHARD H. FERGUSON, B.Sc.Agr., Extension Professor of Agricultural Economics.	5 School Street.
GEORGE F. E. STORY, B.Sc., Extension Instructor in Animal Husbandry.	10 Allen Street.
RALPH W. REES, A.B., B.Sc., Extension Instructor in Pomology.	24 Pleasant Street.
HERBERT J. BAKER, B.Sc., Extension Instructor in Farm Management.	24 Pleasant Street.
PHILIP H. ELWOOD, Jr., B.Sc.Agr., Extension Instructor in Civic Improvement.	24 Pleasant Street.
ALLISTER F. McDUGALL, B.Sc., Extension Instructor in charge of Demonstration Auto Truck.	24 Pleasant Street.

ERWIN H. FORBUSH, . . . . .	8 Nutting Avenue.
Supervisor of Correspondence Courses.	
ETHEL H. NASH, . . . . .	16 Nutting Avenue.
Extension Instructor in Agricultural Education.	
HARRIET J. HOPKINS, B.Sc., . . . . .	79 Pleasant Street.
Extension Instructor in Home Economics.	
BENJAMIN W. ELLIS, B.Sc., . . . . .	24 Pleasant Street.
Extension Instructor in Farm Demonstration.	
LAWRENCE B. BOSTON, <sup>1</sup> . . . . .	Sandwich.
Agricultural Adviser, Barnstable County.	
JOHN A. SCHEUERLE, <sup>1</sup> . . . . .	Springfield.
Secretary, Hampden County Improvement League.	

## THE CLERICAL STAFF.

CLARISSA G. BABCOCK, B.Sc., . . . . .	77 South Pleasant Street.
Library Assistant.	
FRANCES C. BOYNTON, A.B., . . . . .	44 Triangle Street.
Clerk, Department of Farm Administration.	
MARY E. CALDWELL, . . . . .	Draper Hall.
Cashier.	
MABEL R. CASE, A.B., . . . . .	9 Phillips Street.
First Clerk, Extension Service.	
ADA M. CHANDLER, A.B., . . . . .	3 Fearing Street.
Cataloguer, Library.	
LENA V. CHAPMAN, . . . . .	77 South Pleasant Street.
Library Assistant.	
BERTHA E. CHRISTIANSEN, A.B., . . . . .	25 Pleasant Street.
Assistant to the Dean.	
LUCIA G. CHURCH, . . . . .	North Amherst.
First Clerk, Experiment Station.	
JESSIE V. CROCKER, . . . . .	Sunderland.
Clerk, Department of Botany.	
MARION S. DONALDSON, B.Sc., . . . . .	9 Phillips Street.
Stenographer, Department of Agricultural Education.	
LINA E. FISHER, . . . . .	28 Pleasant Street.
Stenographer, Department of Chemistry.	
GRACE E. GAILOND, . . . . .	28 Pleasant Street.
Stenographer, Experiment Station.	
ALICE M. GILBERT, . . . . .	Draper Hall.
Clerk, Department of Dairying.	
LILLIAN M. GELINAS, . . . . .	77 Pleasant Street.
Clerk, President's Office.	
HANNAH M. GRIFFIN, A.B., . . . . .	9 Phillips Street.
Clerk, Department of Farm Administration.	
CORA B. GROVER, . . . . .	North Amherst.
Clerk, Extension Service.	
MARION GUERTIN, . . . . .	20 Pleasant Street.
Stenographer, Department of Beekeeping.	
MARY E. HORTON, . . . . .	15 Fearing Street.
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Clerk, Department of Microbiology and Division of the Humanities.	
ALICE M. HOWARD, . . . . .	North Amherst.
First Clerk, Experiment Station.	
LORIAN P. JEFFERSON, A.M., . . . . .	84 Pleasant Street.
Expert Secretary, Division of Rural Social Science.	
REBECCA L. MELLOR, . . . . .	7 Northampton Road.
Clerk, Experiment Station.	
FAY L. MILTON, . . . . .	Draper Hall.
Clerk, Department of Poultry Husbandry.	

<sup>1</sup> Gives part-time service to the Massachusetts Agricultural College.

NELL C. MILTON,	Draper Hall.
Stenographer, Division of Rural Social Science.	
ELIZABETH E. MOONEY, <sup>1</sup>	Northampton.
Stenographer, Department of Poultry Husbandry.	
GLADYS P. MOORE,	- -
Stenographer, Treasurer's Office.	
BRIDIE E. O'DONNELL,	Hadley.
Clerk, Department of Entomology.	
INA M. PAIGE,	Draper Hall.
Stenographer, Extension Service.	
HELEN C. POMEROY,	17 Pleasant Street.
Stenographer, Division of Horticulture.	
LUTHER R. PUTNEY,	Lincoln Avenue.
Clerk, Treasurer's Office.	
GLADYS E. RUSSELL, A.B.,	9 Phillips Street.
Clerk, Division of Horticulture.	
EDNA M. SANDERS,	Hadley.
Bookkeeper, Treasurer's Office.	
ELSA SLATTERY,	Northampton.
Stenographer, Extension Service.	
DOROTHY F. SMITH,	Draper Hall.
Clerk, Division of Horticulture.	
HARRIET C. STEVENSON, <sup>1</sup>	Woodside Avenue.
Stenographer, Department of Agricultural Economics.	
OLIVE M. TURNER, B.Sc.,	22 Spaulding Street.
Clerk, Registrar's Office.	
HENRIETTA L. WEBSTER,	Draper Hall.
First Clerk, Treasurer's Office.	
AURELIA B. WENTWORTH,	South Amherst.
Stenographer, Division of Agriculture.	

## STAFF OF OPERATING AND MAINTENANCE.

JOHN J. BARBER,	Campus.
Farm Superintendent.	
JOHN L. BYARD,	21 Pleasant Street.
Superintendent of the Apiary.	
WILLIAM CHESLEY,	Draper Hall.
Steward of the Dining Hall.	
LAWRENCE S. DICKINSON, B.Sc.,	2 Farview Way.
Foreman of Grounds.	
CLARENCE A. JEWETT,	112 Pleasant Street.
Superintendent of Buildings.	
JOHN J. LEE,	East Pleasant Street.
Assistant to the Military Detail.	
PERCY C. SCHROYER, B.Sc.,	6 Phillips Street.
Assistant Engineer.	
NEWTON WALLACE,	Campus.
Electrician.	
JAMES WHITING,	16 Hallock Street.
Foreman, Department of Floriculture.	

<sup>1</sup> On part time.



## STANDING COMMITTEES OF THE FACULTY.<sup>1</sup>

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1914-15.

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### CATALOGUE AND OTHER PUBLICATIONS.

Associate Professor NEAL.  
 Assistant Professor SMITH.  
 Assistant Professor ROBBINS.  
 Secretary WATTS.

### COMMENCEMENT.

Professor PAIGE.  
 Treasurer KENNEY.  
 Captain MARTIN.  
 Professor LOCKWOOD.  
 Associate Professor PETERS.  
 Associate Professor NEHRLING.  
 Assistant Professor DUNCAN.  
 Secretary WATTS.

### COURSE OF STUDY.

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 Professor HART.  
 Professor WAUGH.  
 Professor FOORD.  
 Professor SPRAGUE.  
 Professor FERNALD.  
 Professor OSTRANDER.  
 Professor MARSHALL.  
 Professor CHAMBERLAIN.  
 Associate Professor CANCE.  
 Assistant Professor CHENOWETH.

### DISCIPLINE (ADVISORY).

Dean LEWIS.  
 Professor HASBROUCK.  
 Associate Professor HICKS.  
 Assistant Professor MACKIMMIE.  
 Assistant Professor MACHMER.

### EMPLOYMENT.

Professor SEARS.  
 Dean LEWIS.  
 Treasurer KENNEY.  
 Associate Professor HASKELL.

### ENTRANCE EXAMINATIONS AND ADMISSION.

Professor HASBROUCK.  
 Professor GRAHAM.  
 Associate Professor OSMUN.  
 Assistant Professor ASHLEY.  
 Assistant Professor MACHMER.  
 Mr. RAND.

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<sup>1</sup> The president of the college is ex officio member of each standing committee.

## HEALTH AND SANITATION.

Professor MARSHALL.  
 Treasurer KENNEY.  
 Captain MARTIN.  
 Professor LOCKWOOD.  
 Associate Professor HICKS.  
 Miss COMSTOCK.

## LIBRARY.

Professor STONE.  
 Professor MARSHALL.  
 Professor WELLINGTON.  
 Professor SPRAGUE.  
 Mr. GREEN.

## SCHEDULE.

Professor LOCKWOOD.  
 Associate Professor PETERS.  
 Assistant Professor MACHMER.

## SCHOLARSHIP.

Associate Professor GORDON.  
 Dean LEWIS.  
 Professor HASBROUCK.  
 Assistant Professor MACKIMMIE.  
 Assistant Professor HARRISON.  
 Assistant Professor MACHMER.

## STUDENT LIFE.

President BUTTERFIELD.  
 Dean LEWIS.  
 Director HURD.  
 Treasurer KENNEY.  
 Professor CHAMBERLAIN.  
 Professor SPRAGUE.  
 Professor HART.  
 Professor CLARK.  
 Associate Professor McLEAN.  
 Associate Professor HASKELL.  
 Associate Professor CRAMPTON.  
 Associate Professor HICKS.  
 Associate Professor ANDERSON.  
 Assistant Professor MACKIMMIE.  
 Assistant Professor QUAlFE.  
 Secretary WATTS.  
 Assistant Professor DUNCAN.  
 Assistant Professor MACHMER.  
 Mr. PRINCE.

## UNCLASSIFIED STUDENTS.

Professor LOCKWOOD.  
 Professor SEARS.  
 Associate Professor PETERS.

## APPOINTED TO ATHLETIC BOARD.

Dean LEWIS.  
 Professor HASBROUCK.  
 Associate Professor OSMUN.

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THE COLLEGE.

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## ADMISSION.

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### A. APPLICATION FOR ADMISSION.

All correspondence concerning admission should be addressed to the registrar.

Every applicant for admission to the college must be at least sixteen years old, and must present to the registrar proper testimonials of good character. Such testimonials, whenever possible, should come from the principal of the school at which the applicant has prepared for college. Candidates who desire to present themselves for examination in any subjects must make application to the college for such privilege at least one month before examination is desired. Blanks for such application may be obtained by addressing the registrar of the college. All entrance credentials must be in the hands of the registrar before the applicant can matriculate.

### B. MODES OF ADMISSION.

Students are admitted to the freshman class either upon certificate or upon examination. No *diploma* from a secondary school will be accepted.

**CERTIFICATES.** — Certificates will be received from those schools in New England which have been approved by the New England College Entrance Certificate Board. Principals of schools in New England who desire the certificate privilege should address the secretary of the Board, Professor Frank W. Nicolson, Wesleyan University, Middletown, Conn. Certificates from schools outside of New England will be received if those schools are on the approved list of the leading colleges of the section in which the school in question is located.

The credentials of the Board of Regents of the State of New York are accepted as satisfying the entrance requirements of this college when offered subject for subject.

Certificates must present not less than seven of the necessary fourteen credits in all. Those subjects lacking on certificate (except for the permitted number of conditions) must be made up at the time of the examinations for admission.

Blank forms for certification — sent to principals or school superintendents only — may be obtained on application to the registrar of the college.

**EXAMINATIONS.** — The examination in each subject may be oral or written, or both. The standard required for passing an examination for admission is 65 per cent. Conditions to the amount of two units will be allowed.<sup>1</sup>

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<sup>1</sup> *Entrance with Condition in English.* — Under the rule permitting entrance conditions of not more than two units of the preparatory subjects, applicants may be admitted upon examination, with a condition in English, provided that they show, upon examination, preparation in work entitling them to a ranking of 60 or higher.

Students so admitted, must, to remove the condition, pass an examination covering the regular three-units requirement.

Entrance examination for admission to the Massachusetts Agricultural College will be held at the following centers:—

**In June,** . . . . . Amherst, Department of Physics building.  
Boston, College of Liberal Arts, Boston University.  
Worcester, Horticultural Hall.

**In September,** . . . . . Amherst, Department of Physics building.

**Please note that September examinations are held in Amherst only.**

*Schedule for Entrance Examinations, June 17-19, inclusive, 1915.*— The examinations in June will follow this schedule:—

*First Day.*

7.45 A.M. Registration.<sup>1</sup>  
8.00 A.M. Plane geometry.  
10.00 A.M. Chemistry.  
11.30 A.M. Botany.  
2.00 P.M. Algebra.  
3.30 P.M. Physics.

*Second Day.*

8.00 A.M. Required English.  
11.00 A.M. Solid geometry.  
2.00 P.M. History, required and elective.

*Third Day.*

8.00 A.M. French, German, required and elective.  
1.00 P.M. Latin A and B and all one-half credit electives, except those already noted.

*Schedule for Entrance Examinations in September.*— In September, 1914, the examinations will be given September 8-11, inclusive, and will follow the order indicated below:—

*First Day.*

1.00 P.M. Registration.  
1.15-5.00 P.M. Greek A and B.

*Second Day.*

8.00 A.M. Plane geometry.  
10.00 A.M. Chemistry.  
11.30 A.M. Botany.  
2.00 P.M. Algebra.  
3.30 P.M. Physics.  
4.30 P.M. Elective English.

*Third Day.*

8.00 A.M. Required English.  
11.00 A.M. Solid geometry, agriculture.  
2.00 P.M. History, required and elective.

*Fourth Day.*

8.00 A.M. French, German, required and elective.  
1.00 P.M. Latin A and B and all one-half credit electives, except those already noted.

<sup>1</sup> Candidates who have no examination at the time set for registration may register at the time of their first examination should they so desire.

## C. REQUIREMENTS FOR ADMISSION.

The requirements for admission are based on the completion of a four-years high school course, or its equivalent, and are stated in terms of units. The term unit means the equivalent of at least four recitations a week for a school year. **Neither more nor less credit will be given in any subject than is indicated in the table below.** Fourteen units must be offered for admission. In the list given below, *every subject in black-faced type is absolutely required and no substitution is allowed.* The subjects so typed total eight and one-half units. In addition to these points five and one-half more units must be chosen from the subjects printed in light-faced type. Not more than four half-credit units may be offered.

Agriculture, <sup>1</sup>	½ or 1
Botany, <sup>2</sup>	½ or 1
Chemistry, <sup>2</sup>	1
<b>Algebra,</b>	1½
<b>Plane geometry,</b>	1
Solid geometry,	½
Trigonometry,	½
Physics, <sup>2</sup>	1
Geology, <sup>2</sup>	½
Physiography,	½
Physiology,	½
Zoölogy, <sup>2</sup>	½
<b>History<sup>3</sup></b> (Ancient; Medieval and Modern; English; General; United States and Civics), <i>any one,</i>	1 <sup>4</sup>
<b>English,</b>	3
English (elective), <sup>1</sup>	1
<b>Modern Language</b> (elementary French or elementary German),	2
Elementary French, <sup>5</sup>	2
Elementary German, <sup>5</sup>	2
Intermediate French,	1
Advanced French,	1
Intermediate German,	1
Advanced German,	1
Greek A, <sup>1</sup>	2
Greek B, <sup>1</sup>	1
Latin A,	2
Latin B,	1
Commercial geography, <sup>6</sup>	½
Drawing, <sup>6</sup>	½
Manual training, <sup>6</sup>	½ or 1

**PRESENTATION OF NOTE-BOOKS.** — The keeping of a note-book is required as part of the preparation in those subjects indicated (see note 2, page 25).

Candidates presenting themselves for examination in such subjects must present at the same time the required note-book, properly certified by the principal. Candidates presenting such subjects on certificates should not present note-books; but their certificates must state that note-books have been satisfactorily completed.

<sup>1</sup> Examination in September only.

<sup>2</sup> Note-book required as part of preparation will be credited as part of the examination.

<sup>3</sup> One must be offered for the required point, one, two or three others may be offered for elective points.

<sup>4</sup> For each offered.

<sup>5</sup> May be offered as elective if not offered to satisfy *required* points.

<sup>6</sup> On certificate only, no examination given.

## D. STATEMENT OF PREPARATION REQUIRED FOR ADMISSION.

AGRICULTURE. — Owing to the wide divergence of the methods of teaching agriculture in the public schools, the student will be required to bring a statement from the principal of the amount and kinds of work accomplished and of the text-books used. The examination will be based somewhat upon this information; but it will call for not less than one-half year of creditable work of high school grade. **The examination in agriculture will be given in September only.**

BOTANY. — For one unit of credit in botany, the work outlined in the statement of requirements issued by the College Entrance Examination Board, or its equivalent, will be accepted. This work should occupy one school year and include laboratory and supplementary text-book study. For one-half unit of credit, work that covers the same ground but occupies half the time required for a full unit of credit will be accepted. These requirements are met by such texts as Steven's "Introduction to Botany" and Bergen and Davis's "Principles of Botany." A note-book containing neat, accurate drawings and descriptive records forms part of the requirement for either the half-unit or the one-unit credit, and this note-book must be presented by all applicants for admission upon examination in this subject. The careful preparation of an herbarium is recommended to all prospective students of this college, although the herbarium is not required.

CHEMISTRY. — The entrance examination in chemistry will cover the work outlined by the College Entrance Examination Board as preparatory for college entrance. In general, this consists of a year of high school chemistry from such text-books as Newell's "Descriptive Chemistry" or Remsen's "Elements of Chemistry," with laboratory work on the general properties of the common elements, some of the experiments being quantitative. The keeping of a note-book is required.

MATHEMATICS. — (a) *Required.* — Algebra: The four fundamental operations for rational algebraic expressions; factoring, determination of highest common factor and lowest common multiple by factoring; fractions, including complex fractions; ratio and proportion; linear equations, both numerical and literal, containing one or more unknown quantities; problems depending on linear equations; radicals, including the extraction of the square root of polynomials and numbers; exponents, including the fractional and negative; quadratic equations, both numerical and literal; simple cases of equations with one or more unknown quantities that can be solved by the methods of linear or quadratic equations; problems depending upon quadratic equations; the binomial theorem for positive integral exponents, the formulas for the  $n$ th term and the sum of the terms of arithmetic and geometric progressions, with applications.

Plane Geometry: The usual theorems and constructions of good text-books, including the general properties of plane rectilinear figures; the circle and the measurement of angles; similar polygons; areas; regular polygons and the measurement of the circle; the solution of numerous original exercises, including loci problems; applications to the mensuration of lines and plane surfaces.

(b) *Elective.* — Solid Geometry: The usual theorems and constructions of good text-books, including the relations of planes and lines in space; the properties and measurement of prisms, pyramids, cylinders and cones; the



sphere and spherical triangle; the solution of numerous original exercises, including loci problems; applications to the mensuration of surfaces and solids.

**Plane Trigonometry:** A knowledge of the definitions and relations of trigonometric functions and of circular measurements and angles; proofs of the principal formulas and the application of these formulas to the transformation of the trigonometric functions; solution of trigonometric equations, the theory and use of logarithms, and the solution of right and oblique triangles.

**PHYSICS.** — To satisfy the entrance requirement in physics, the equivalent of at least one unit of work is required. This work must consist of both class-room work and laboratory practice. The work covered in the class-room should be equal to that outlined in Hall & Bergen's "Text-book of Physics" or Millikan & Gale; the laboratory work should represent at least thirty-five experiments involving careful measurements, with accurate recording of each in laboratory note-book. This note-book, certified by the instructor in the subject, must be submitted by each candidate presenting himself for examination in physics; credit for passing the subject will be given on laboratory notes and on the examination paper submitted. Candidates entering on certificate will not be required to present note-books, but the principal's certification must cover laboratory as well as class-room work.

**PHYSIOLOGY.** — Hough & Sedgwick's "The Human Mechanism;" Martin's "The Human Body; Briefer Course."

**ZOOLOGY, PHYSIOGRAPHY, GEOLOGY.** — The following suggestions are made concerning preparation for admission in the subjects named above: —

For physiography, Davis's "Elementary Physical Geography;" Gilbert & Brigham's "Introduction to Physical Geography." For zoölogy, text-books entitled "Animals" or "Animal Studies," by Jordan, Kellogg and Heath; Linville & Kelley's "A Text-book in General Zoölogy." For geology, A. P. Brigham's "A Text-book of Geology" or Tarr's "Elementary Geology."

Applicants for examination in zoölogy are *required* to present certified laboratory note-books; applicants for examination in the other subjects are *advised* to present note-books, if laboratory work has been done. Good note-books may be given credit for entrance. Examination in these subjects will be general, in recognition of the different methods of conducting courses; but students will be examined on the basis of the most thorough secondary school courses.

**HISTORY.** — The required unit must be offered in either ancient history, mediæval and modern history, English history, general history, or United States history and civics. Either one, two or three elective units in any of the historical subjects here named may be offered, provided that no unit be offered in the same subject in which the required unit has been offered.

Preparation in history will be satisfactory if made in accordance with the recommendations of the committee of seven of the American Historical Association, as outlined by the College Entrance Examination Board. The examination will require comparisons and the use of judgment by the candidate rather than the mere use of memory, and it will presuppose the use of good text-books, collateral reading and practice in written work. Geographical knowledge may be tested by requiring the location of places and movements on outline maps.

To indicate in a general way the character of the text-book work expected, the texts of the following authors are suggested: Botsford, Morey or Myers,

in ancient history (to 814 A.D.); Adams, West or Myers, in medieval history; Montgomery, Larned or Cheyney, in English history; Myers or Fisher, in general history; Fiske, together with MacLaughlin or Montgomery in United States history and civics.

ENGLISH. — For 1915-19 inclusive: —

The study of English in school has two main objects: (1) command of correct and clear English, spoken and written; (2) ability to read with accuracy, intelligence and appreciation.

*Grammar and Composition.* — The first object requires instruction in grammar and composition. English grammar should ordinarily be reviewed in the secondary school; and correct spelling and grammatical accuracy should be rigorously exacted in connection with all written work during the four years. The principles of English composition governing punctuation, the use of words, sentences and paragraphs should be thoroughly mastered; and practice in composition, oral as well as written, should extend throughout the secondary school period. Written exercises may well comprise letter-writing, narration, description and easy exposition and argument. It is advisable that subjects for this work be taken from the student's personal experience, general knowledge and studies other than English, as well as from his reading in literature. Finally, special instruction in language and composition should be accompanied by concerted effort of teachers in all branches to cultivate in the student the habit of using good English in his recitations and various exercises, whether oral or written.

*Literature.* — The second object is sought by means of two lists of books, headed, respectively, "Reading" and "Study," from which may be framed a progressive course in literature covering four years. In connection with both lists the student should be trained in reading aloud and encouraged to commit to memory some of the more notable passages both in verse and in prose. As an aid to literary appreciation, he is further advised to acquaint himself with the most important facts in the lives of the authors whose works he reads and with their place in literary history.

*A. Reading.* — The aim of this course is to foster in the student the habit of intelligent reading and to develop a taste for good literature by giving him a first-hand knowledge of some of its best specimens. He should read the books carefully, but his attention should not be so fixed upon details that he fails to appreciate the main purpose and charm of what he reads.

With a view to large freedom of choice, the books provided for reading are arranged in the following groups, from each of which at least two selections are to be made, except as otherwise provided under Group I.: —

*Group I. Classics in Translation:* The "Old Testament," comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings and Daniel, together with the books of Ruth and Esther; the "Odyssey," with the omission, if desired, of books I., II., III., IV., V., XV., XVI., XVII.; the "Iliad," with the omission, if desired, of books XI., XIII., XIV., XV., XVII., XXI.; the "Æneid." The "Odyssey," "Iliad" and "Æneid" should be read in English translations of recognized literary excellence.

For any selection from group I. a selection from any other group may be substituted.

*Group II. Shakspeare:* "Midsummer Night's Dream;" "Merchant of Venice;" "As You Like It;" "Twelfth Night;" "The Tempest;" "Romeo

and Juliet;" "King John;" "Richard II.;" "Richard III.;" "Henry V.;" "Coriolanus;" "Julius Cæsar;"<sup>1</sup> "Macbeth;"<sup>1</sup> "Hamlet."<sup>1</sup>

*Group III. Prose Fiction:* Malory's "Morte d'Arthur" (about 100 pages); Bunyan's "Pilgrim's Progress," Part I.; Swift's "Gulliver's Travels" (voyages to Lilliput and to Brobdingnag); Defoe's "Robinson Crusoe," Part I.; Goldsmith's "Vicar of Wakefield;" Frances Burney's "Evelina;" Scott's novels, any *one*; Jane Austen's novels, any *one*; Maria Edgeworth's "Castle Rackrent" or "The Absentee;" Dickens's novels, any *one*; Thackeray's novels, any *one*; George Eliot's novels, any *one*; Mrs. Gaskell's "Cranford;" Kingsley's "Westward Ho!" or "Hereward the Wake;" Reade's "The Cloister and the Hearth;" Blackmore's "Lorna Doone;" Hughes's "Tom Brown's School Days;" Stevenson's "Treasure Island" or "Kidnapped" or "Master of Ballantrae;" Cooper's novels, any *one*; Poe's "Selected Tales;" Hawthorne's "The House of the Seven Gables" or "Twice Told Tales" or "Mosses from an Old Manse;" a collection of short stories by various standard writers.

*Group IV. Essays, Biography, etc.:* Addison and Steele's "The Sir Roger de Coverley Papers" or selections from the "Tatler" and "Spectator" (about 200 pages); selections from Boswell's "Life of Johnson" (about 200 pages); Franklin's "Autobiography;" selections from Irving's "Sketch Book" (about 200 pages) or "Life of Goldsmith;" Southey's "Life of Nelson;" selections from Lamb's "Essays of Elia" (about 100 pages); selections from Lockhart's "Life of Scott" (about 200 pages); Thackeray's "Lectures on Swift, Addison and Steele in the English Humorists;" Macaulay: any one of the following essays: "Lord Clive," "Warren Hastings," "Milton," "Addison," "Goldsmith," "Frederic the Great," "Madame d'Arblay;" selections from Trevelyan's "Life of Macaulay" (about 200 pages); Ruskin's "Sesame and Lilies" or "Selections" (about 150 pages); Dana's "Two Years before the Mast;" Lincoln's "Selections," including at least the two inaugurals, the speeches in Independence Hall and at Gettysburg, the last public address, the letter to Horace Greeley, together with a brief memoir or estimate of Lincoln; Parkman's "The Oregon Trail;" Thoreau's "Walden;" Lowell's "Selected Essays" (about 150 pages); Holmes's "The Autocrat of the Breakfast Table;" Stevenson's "An Inland Voyage" and "Travels with a Donkey;" Huxley's "Autobiography" and selections from "Lay Sermons," including the addresses on "Improving Natural Knowledge," "A Liberal Education" and "A Piece of Chalk;" a collection of "Essays" by Bacon, Lamb, De Quincey, Hazlitt, Emerson and later writers; a collection of "Letters" by various standard writers.

*Group V. Poetry:* Palgrave's "Golden Treasury" (first series), books II. and III., with special attention to Dryden, Collins, Gray, Cowper and Burns; Palgrave's "Golden Treasury" (first series), Book IV., with special attention to Wordsworth, Keats and Shelley (if not chosen for study under B); Goldsmith's "The Traveller" and "The Deserted Village;" Pope's "The Rape of the Lock;" a collection of English and Scottish ballads, as, for example, some "Robin Hood" ballads, "The Battle of Otterburn," "King Estmere," "Young Beichan," "Bewick and Grahame," "Sir Patrick Spens" and a selection from later ballads; Coleridge's "The Ancient Mariner," "Christabel" and "Kubla Khan;" Byron's "Childe Harold," Canto III. or IV., and "The Prisoner of Chillon;" Scott's "The Lady of the Lake," or "Marmion;"

<sup>1</sup> If not chosen for study under B.

Macaulay's "The Lays of Ancient Rome," "The Battle of Naseby," "The Armada," "Ivry;" Tennyson's "The Princess" or "Gareth and Lynette," "Lancelot and Elaine" and "The Passing of Arthur;" Browning's "Cavalier Tunes," "The Lost Leader," "How They Brought the Good News from Ghent to Aix," "Home Thoughts from Abroad," "Home Thoughts from the Sea," "Incident of the French Camp," "Hervé Riel," "Pheidippides," "My Last Duchess," "Up at a Villa — Down in the City," "The Italian in England," "The Patriot," "The Pied Piper," "De Gustibus," "Instans Tyrannus;" Arnold's "Sohrab and Rustum" and "The Forsaken Mermaid;" selections from American poetry, with special attention to Poe, Lowell, Longfellow and Whittier.

*B. Study.* — This part of the requirement is intended as a natural and logical continuation of the student's earlier reading, with greater stress laid upon form and style, the exact meaning of words and phrases, and the understanding of allusions. The books provided for study are arranged in four groups, from each of which one selection is to be made.

*Group I. Drama:* Shakspeare's "Julius Cæsar," "Macbeth," "Hamlet."

*Group II. Poetry:* Milton's "L'Allegro," "Il Penseroso" and either "Comus" or "Lycidas;" Tennyson's "The Coming of Arthur," "The Holy Grail" and "The Passing of Arthur;" the selections from Wordsworth, Keats and Shelley in Book IV. of Palgrave's "Golden Treasury" (first series).

*Group III. Oratory:* Burke's "Speech on Conciliation with America;" Macaulay's "Speech on Copyright" and Lincoln's "Speech at Cooper Union;" Washington's "Farewell Address" and Webster's "First Bunker Hill Oration."

*Group IV. Essays:* Carlyle's "Essay on Burns," with a selection from Burns's "Poems;" Macaulay's "Life of Johnson;" Emerson's "Essay on Manners."

*Examination.* — However accurate in subject-matter, no paper will be considered satisfactory if seriously defective in punctuation, spelling or other essentials of good usage.

The examination will be divided into two parts, one of which will be on grammar and composition, and the other on literature.

In grammar and composition, the candidate may be asked specific questions upon the practical essentials of these studies, such as the relation of the various parts of a sentence to one another, the construction of individual words in a sentence of reasonable difficulty, and those good usages of modern English which one should know in distinction from current errors. The main test in composition will consist of one or more essays, developing a theme through several paragraphs; the subjects will be drawn from the books read, from the candidate's other studies and from his personal knowledge and experience quite apart from reading. For this purpose the examiner will provide several subjects, perhaps eight or ten, from which the candidate may make his own selections. He will not be expected to write more than four hundred words per hour.

The examination in literature will include: —

(a) General questions designed to test such a knowledge and appreciation of literature as may be gained by fulfilling the requirements defined under "A, Reading," above. The candidate will be required to submit a list of the books read in preparation for the examination, certified by the principal of the school in which he was prepared; but this list will not be made the basis of detailed questions.

(b) A test on the books prescribed for study, which will consist of questions upon their content, form and structure, and upon the meaning of such words, phrases and allusions as may be necessary to an understanding of the works and an appreciation of their salient qualities of style. General questions may also be asked concerning the lives of the authors, their works and the periods of literary history to which they belong.

The Massachusetts Agricultural College calls attention to the following recommendations of the national conference, which agree with its policy:—

1. That colleges so desiring may set an examination requiring no prescribed books, but testing the same general kind of preparation as that indicated in the foregoing requirements.

2. That individual colleges take such steps as may be found necessary to ascertain whether candidates for entrance possess an adequate equipment in oral English.

As rapidly as seems expedient the college will proceed in accordance with these recommendations. Schools wishing to present candidates prepared in conformity to the intent of the recommendations will have the co-operation of the college.

ENGLISH, ELECTIVE. — To secure a fourth entrance credit in English, the applicant should do (a) the full equivalent of three years' work (required English), and also (b) the full equivalent of a fourth year's work. Applicants not certified with a fourth entrance credit will be examined, provided that the applicant, on or before June 1, notify the Department of English of his intention to take the examination, and supply thereafter the information needed by the department to prepare the examination questions. The information blanks will be forwarded by the Department of English upon receipt of the notice. **(The examination in English elective will be given in September only.)**

*Subjects accepted.* — The applicant may offer (a) any one of the subjects stated hereunder, or (b) any two of these subjects in combination.

(a) History of American literature.

(b) History of English literature (or lives of the great authors).

(c) Classics *other than those read to meet the three-credit requirement.*

(d) Advanced composition.

(e) History of the English language.

(f) Advanced high school grammar.

*Advanced Standing in College.* — Whether advanced standing shall be given applicants entering with a fourth credit in English will be determined by consideration of each case individually. Much weight is given to the ability of the student to express himself correctly and clearly, to think clearly, and to grasp the meaning of printed language. A special examination will be given in the opening week of college, notice of which will be posted on the English bulletin board, for freshmen who wish to apply for advanced standing.

*Presentation of Note-books and Themes.* — Applicants for examination, either for fourth-unit credit or for advanced standing, are advised to present the note-books, themes, etc., prepared by them in the preparatory school, as an aid toward determining their proficiency.

FRENCH. — Elementary: The necessary preparation for this examination is stated in the description of the two-year course in elementary French recommended by the Modern Language Association, contained in the definition of requirements of the College Entrance Examination Board.

Third and fourth year French (elective subjects for admission). — For a third credit unit in French as an elective subject for entrance, the work heretofore described by the College Entrance Examination Board as “intermediate” is expected. For a fourth credit unit, the work described as “advanced” is expected.

No examination for a third unit in French will be given unless the candidate has presented elementary French on certificate, or has written the examination in elementary French.

No examination for a fourth credit in French will be given unless the candidate has presented both elementary and intermediate French upon certificate, or has written the examination in both elementary and intermediate French.

GERMAN. — Elementary: The entrance requirements in German conform to those of the College Entrance Examination Board for elementary German (the standard two-year requirements).

Third and fourth year German (elective subjects for admission). — For a third credit unit in German as an elective subject for entrance, when required units have been offered in German, the work heretofore described by the College Entrance Examination Board as “intermediate” is expected. For a fourth credit unit, the work described as “advanced” is expected.

No examination for a third unit in German will be given unless the candidate has presented elementary German upon certificate, or has written the examination in elementary German.

No examination for a fourth credit in German will be given unless the candidate has presented both elementary and intermediate German upon certificate, or has written the examination for both elementary and intermediate German.

GREEK. — Greek will receive credit as an elective requirement upon either examination or certification, as follows. (**The examination in Greek A and Greek B will be given in September only.**)

A. Two credit units will be allowed if satisfactory proficiency is shown (including grammar) in (a) the translation of a passage or passages taken from the first four books of Xenophon’s “Anabasis,” and (b) the translation of passages of Attic prose at sight.

B. A third credit unit will be allowed if, in addition to the above, satisfactory proficiency be shown in (a) the translation of a passage or passages from the first six books of Homer’s “Iliad,” and (b) translation of passages of Homer’s “Iliad” at sight, with questions on the form and constructions of the passages.

LATIN. — Latin will receive credit as an elective requirement upon either examination or certification, as follows: —

A. Two credit units will be allowed if satisfactory proficiency is shown (including grammar) in (a) the translation of a passage or passages taken from Cæsar’s “Gallic War,” covering at least four books, and (b) the translation of passages of Latin prose at sight.

B. A third credit unit will be allowed if, in addition to the above, satisfactory proficiency be shown in (a) the translation of a passage or passages selected from either books I. to VI. of Virgil’s “Æneid,” or six orations of Cicero, including those against Catiline; and (b) the translation into Latin prose of a passage of connected English narrative based on some portion of Cæsar’s “Gallic War,” books I. to IV.

COMMERCIAL GEOGRAPHY.<sup>1</sup> — Preparation should be made in a course equivalent to that laid down in Adams's "Commercial Geography," Trotter's "Geography of Commerce," or a similar work. (No examination given.)

DRAWING.<sup>1</sup> — The applicant may offer either freehand or mechanical drawing or both. He must be able to make an accurate freehand sketch in either outline or light and shade, of the appearance of a group of geometric solids, and have a sufficient knowledge of perspective to enable him to draw correctly a simple geometric model from memory; or, if he present mechanical drawing, he must have working familiarity with drawing instruments, and be able to make an accurate inked working drawing, in orthographic projection, of some simple object. Emphasis is laid on facility in doing good freehand lettering. For a limitation of the work that may be presented, see "Manual Training." (No examination given.)

MANUAL TRAINING.<sup>1</sup> — An entrance credit of one-half or one unit is allowed for manual training, on the presentation of a certificate from the principal of the school showing the scope and character of the applicant's work. The preparation may include mechanical drawing, working in wood, metals, leather, etc. When mechanical drawing is presented as a part of the work in manual training, no other credit for drawing will be allowed. No examination is given in this subject; applicants must present certificates to secure credit.

#### E. ADMISSION TO ADVANCED STANDING.

Candidates for admission to advanced standing, in addition to meeting the regular entrance requirements, must also pass examinations in those subjects already pursued by the class they desire to enter. To meet this requirement, a student transferring to this college from another college or university of recognized standing must present the following credentials: —

1. A letter of honorable dismissal from the institution with which he has been connected.
2. A statement or certificate of his entrance record.
3. A statement from the proper officer showing a complete record of his work while in attendance.
4. A marked catalogue showing the courses pursued.

These credentials should be presented to the registrar. Applications will be judged wholly on their merits and the college may prescribe additional tests before accepting applicants or determining the standing to be granted them.

#### F. OTHER INFORMATION ABOUT ENTRANCE.

1. The privileges of the college may be withdrawn from any student<sup>m</sup> at any time if such action is deemed advisable. (It is immaterial whether<sup>n</sup> the pupil has entered by certificate or by examination.)
2. The examination in each subject may be either oral or written, or both. The standard required for passing an entrance examination is 65 per cent.
3. Candidates must receive credit for twelve units out of the total number required for entrance, and will be conditioned in those subjects not passed. No candidate deficient in both algebra and plane geometry will be admitted.
4. Examinations for the removal of entrance conditions will be held as follows: (1) First entrance condition examination, in the week following

<sup>1</sup> On certificate only; no examination given.

the Thanksgiving recess. (2) Second entrance condition examination, in the sixteenth week of the first semester.

5. Credits for entrance requirements, whether gained by certificate or by examination, will hold good for one year.

6. Examinations in part of the subjects required for entrance may be taken one year before entering college.

7. For information concerning expenses, scholarships, etc., see "General Information."

8. For information concerning admission to short courses see "Short Courses."

#### G. UNCLASSIFIED STUDENTS.

**All requests for information concerning admission of unclassified students should be addressed to Professor W. P. B. Lockwood, chairman of committee on unclassified students.**

Students not candidates for a degree (unclassified students) are admitted under the following provisions:—

1. No entrance examination is required, but applicants must bring certificates showing that they have finished a four-years high school course or its equivalent, and furnish satisfactory testimonials as to moral character.

2. No applicant under twenty-one years of age will be admitted as an unclassified student.

3. Each unclassified student must take from the regular courses a minimum of twelve credit hours a week.

4. In order to be admitted to any course, an unclassified student must have had all prerequisite subjects for that course.

5. Every unclassified student must do all the work of the courses elected, and take all examinations therein. In order to pass such courses he must attain a grade of at least 75 per cent. An unclassified student who passes in less than two-thirds of his work will be dropped from college.

6. All unclassified students are subject to the supervision of a special committee.

7. Any unclassified student may be dropped from college at any time if his presence in any class is undesirable or his work is unsatisfactory; and no unclassified student will be allowed to remain in college more than four semesters without the special permission of the faculty.

8. Unclassified students are subject to the regulations applying to classified students.

9. No student of this or any other institution who has not done efficient work therein shall be permitted to register as an unclassified student.

10. No unclassified student shall be allowed to participate in any inter-collegiate contests.



## COURSES OF INSTRUCTION.

### A. TABLE OF FRESHMAN AND SOPHOMORE SUBJECTS.<sup>1</sup>

The figures indicate the number of credit hours a week. For details, see the descriptions of courses.

#### FRESHMAN YEAR.

##### *First Semester.*

All work required.

Subjects.	Hours per Week.
Chemistry, . . . . .	3
Algebra, . . . . .	3
Solid Geometry, <sup>2</sup> . . . . .	2
English, . . . . .	4
Public Speaking (at option of instructor), . . . . .	1
French or German, <sup>3</sup> . . . . .	4
Drill, . . . . .	1
Hygiene, . . . . .	1
College Life (attendance without credit).	

18 or 19

##### *Second Semester.*

All work required.

Subjects.	Hours per Week.
Animal Husbandry, . . . . .	2
Chemistry, . . . . .	3
Trigonometry, . . . . .	3
Algebra, . . . . .	2
English, . . . . .	4
Public Speaking (if not taken in semester one), . . . . .	1
French or German, . . . . .	4
Drill, . . . . .	1
Physical Education, . . . . .	1

20 or 21

<sup>1</sup> Applies to the classes of 1917 and 1918 only. See next page for course of study for class of 1919.

<sup>2</sup> To be taken in course when not offered for entrance.

<sup>3</sup> Students who have had three or four years of one language in the preparatory school will elect the other language. Students who have had two years of one language may have their choice of election. Whichever language they so elect must be continued to the end of the first semester of the sophomore year. Eleven college credits are required in this language.

SOPHOMORE YEAR.

*First Semester.*

All work required except Chemistry or Animal Husbandry.

Subjects.	Hours per Week.
Agronomy, . . . . .	3
Physics, . . . . .	5
Zoölogy, . . . . .	3
English, . . . . .	2
French or German, . . . . .	3
Tactics, . . . . .	1
Drill, . . . . .	1
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	18

[Chemistry or Animal Husbandry (may be elected subject to approval by the dean), . . . . . 3]

[21]

*Second Semester.*<sup>1</sup>

Required.

Subjects.	Hours per Week.
Elementary Horticulture, . . . . .	2
Botany, . . . . .	4
English, . . . . .	2
Agricultural Industry, . . . . .	3
Drill, . . . . .	1
Tactics, . . . . .	1
Physical Education, . . . . .	1
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	14

Elective.

French or German, } Geology, . . . } Physics, . . . } Chemistry, . . . } Surveying, . . . }	Each 3 hours. Any two, . . . . .	6
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		20

The following table shows the course of study that will be in effect with the entrance of the class of 1919:—

FRESHMAN YEAR.

*First Semester.*

*Second Semester.*

English and Public Speaking, . . . . .	4 or 3	English and Public Speaking, . . . . .	4 or 3
Algebra, . . . . .	3	Trigonometry, . . . . .	3
Geometry, . . . . .	2	Algebra, . . . . .	2
Chemistry, . . . . .	3	Chemistry, . . . . .	3
Drill, etc., 2; Military Tactics, 1, . . . . .	3	Drill, etc., 2; Military Tactics, 1, . . . . .	3
Language, . . . . .	3	Agricultural Geology, . . . . .	3
Agriculture and Horticulture, . . . . .	2	Language, . . . . .	3
	—	Agriculture and Horticulture, . . . . .	2
	20 or 19		—
			23 or 22

<sup>1</sup> All courses under "Required," with any two of those under "Elective."

## SOPHOMORE YEAR.

<i>First Semester.</i>	<i>Second Semester.</i>
Physics, . . . . . 4	Agronomy, . . . . . 3
English, . . . . . 2	English, . . . . . 2
Zoölogy, . . . . . 3	Botany, . . . . . 4
Rural Community, . . . . . 2	Drill, etc., . . . . . 2
Drill, etc., . . . . . 2	Agricultural Industry, . . . . . 3
2 or 3 electives, . . . . . 6 or 9	2 or 3 electives, . . . . . 6 or 9
19 to 22	20 to 23
<i>Electives (subject to Revision).</i>	
Language, . . . . . 3	Language, . . . . . 3
Mathematics, . . . . . 3	Agriculture (?), . . . . . 3
Agriculture, . . . . . 3	Chemistry, . . . . . 3
Chemistry, . . . . . 3	Entomology, . . . . . 4
Free-hand Drawing, . . . . . 3	Geology, . . . . . 3
Anthropology, . . . . . 3	Surveying, . . . . . 3
	Horticulture, . . . . . 3
	Physics, . . . . . 4
	Zoölogy, . . . . . 3
	Agricultural Education (?), . . . . . 3
	Mechanical Drawing, . . . . . 3

## B. MAJORS: JUNIOR AND SENIOR YEARS.

## GENERAL STATEMENT.

A major consists of 30 hours of correlated work, to be arranged by the student and an instructor called the adviser.

The list of courses found under each major on subsequent pages should not be considered as necessarily a rigid program to be followed. The heads of departments have suggested this series of courses as the best for the average man majoring in their departments. Advisers may, however, make modifications to suit the particular needs of the student, provided these modifications conform precisely to the class schedule as published for the year.

## RULES GOVERNING MAJORS.

**RULE 1. *Election.*** — Each student, in the second semester of his sophomore year, shall elect a major subject from the list of majors given below; and this major shall consist of 30 credit hours of correlated work.

**RULE 2. *Minimum Credits.*** — The minimum number of credits for the junior and senior years shall be 65, inclusive of Military Drill and Physical Education.

**RULE 3. *Maximum Credits.*** — The maximum number of credits for any semester of the junior or senior year shall be 21.

**RULE 4. *Humanities and Rural Social Science.*** — A minimum of 12 credit hours in the Divisions of the Humanities and Rural Social Science will be required of all students during their junior and senior years, with the following restriction: that a minimum of 3 credit hours will be required in each of the divisions.

**RULE 5. *Advisers.*** — The work of each junior and senior will be under the immediate supervision of an instructor designated as major adviser. Ordinarily, the major adviser will be the head of the department in which the student intends to elect his major. Each student should consult with the adviser as soon as possible. The adviser has full authority to prescribe the student's work up to 30 hours. It is understood, however, that so far as practicable the individual needs of the student will be recognized. It is also hoped and expected that students will be disposed to seek the counsel of the adviser with respect to the remaining courses required for graduation.

**RULE 6. *Free Electives.*** — Each student is required to take 30 hours in his major and also 12 hours in the Divisions of the Humanities and Rural Social Science, making a total of 42 hours. He is allowed free choice of courses to complete his required hours, this remainder amounting to 17 hours minimum, or 37 hours maximum for the two years.

**RULE 7. *Registration.*** — No upper classman shall register until his major course of study is approved by his adviser.

(1) Course cards for recording the election of majors will be issued from the registrar's office on June 1.

(2) This card must be submitted by each student to his major adviser, who will lay out the course for the year and countersign the card.

(3) Each course card must be filled out, giving the name of student, his college address, the name of parent or guardian, and the student's home address. When the major courses have been entered on this card, and the hours of free elections added by the student, the card must be returned to the registrar not later than June 10.

**RULE 8. Changes.** — Applications for changes may be made to the dean in writing at any time; when approved by him and by the committee on scholarship, they become operative at the beginning of the semester following, provided that no change in the selection of a major may be made by any student after registration day of his senior year.

### LIST OF MAJORS.

#### Agriculture.

Professor JAMES A. FOORD, Adviser.

Course.	Credit.
Agronomy 3, . . . . .	3
Agronomy 6, . . . . .	3
Animal Husbandry 3, . . . . .	3
Animal Husbandry 5, . . . . .	3
Animal Husbandry 9, . . . . .	3
Dairying 1, . . . . .	3
Dairying 2, . . . . .	3
Farm Administration 3, . . . . .	3
Farm Administration 4, . . . . .	3
Microbiology 1 and 2, . . . . .	5
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Chemistry 7 and 8, Veterinary Science 1, Microbiology 2, Pomology 1 and Animal Husbandry 6 are suggested as additional courses for the student fitting himself for general agriculture.

#### Agronomy.

Associate Professor SIDNEY B. HASKELL, Adviser.

Course.	Credit.
Agronomy 3, . . . . .	3
Agronomy 4, . . . . .	3
Agronomy 5, . . . . .	3
Agronomy 6, . . . . .	3
Agronomy 8, . . . . .	3
Animal Husbandry 9, . . . . .	3
Farm Administration 4, . . . . .	3
Chemistry 5, . . . . .	5
Chemistry 6, . . . . .	5
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#### Animal Husbandry.

Associate Professor J. ALLAN McLEAN, Adviser.

Course.	Credit.
Agronomy 3, . . . . .	3
Veterinary Science 1, Veterinary Hygiene and Stable Sanitation, . . . . .	3
Veterinary Science 2, General Veterinary Pathology (Materia Medica and Therapeutics), . . . . .	3
Animal Husbandry 5, . . . . .	3
Animal Husbandry 6, . . . . .	1
Animal Husbandry 8, . . . . .	2
Animal Husbandry 9, . . . . .	3
Animal Husbandry 10, . . . . .	3
Animal Husbandry 11, . . . . .	2
Dairying 1, . . . . .	3
Farm Administration 3, . . . . .	3
Farm Administration 4, . . . . .	3
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	32

**Dairying.**

Professor WILLIAM P. B. LOCKWOOD, Adviser.

Course.	Credit.
Animal Husbandry 5, . . . . .	3
Animal Husbandry 6, . . . . .	1
Animal Husbandry 8, . . . . .	2
Animal Husbandry 9, . . . . .	3
Animal Husbandry 11, . . . . .	2
Dairying 1, . . . . .	3
Dairying 2, . . . . .	3
Dairying 3, . . . . .	3
Microbiology 11 and 12, . . . . .	3
Farm Administration 3, . . . . .	3
Farm Administration 4, . . . . .	3
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**Poultry Husbandry.**

Professor JOHN C. GRAHAM, Adviser.

Course.	Credit.
Poultry Husbandry 1, . . . . .	2
Poultry Husbandry 2, . . . . .	2
Poultry Husbandry 3, . . . . .	1
Poultry Husbandry 4, . . . . .	1-3
Poultry Husbandry 5, . . . . .	1
Poultry Husbandry 6, . . . . .	3
Poultry Husbandry 7, . . . . .	3
Poultry Husbandry 9, . . . . .	3
Pomology 1, . . . . .	3
Agronomy 3, . . . . .	3
Animal Husbandry 5, . . . . .	3
Animal Husbandry 9, . . . . .	3
Veterinary Science 7, . . . . .	3
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	31-33

**Floriculture.**

Associate Professor ARNO H. NEHRLING, Adviser.

Course.	Credit.
Floriculture 1, . . . . .	4
Floriculture 2, . . . . .	4
Floriculture 3, . . . . .	3
Floriculture 4, . . . . .	3
Horticulture 3, . . . . .	3
Horticulture 4, . . . . .	3
Entomology 1, . . . . .	3
Market Gardening 2, . . . . .	3
Botany 2, . . . . .	4
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	30

*Note.* — Horticulture 3 and 4 is a junior subject, but to balance the work for the two years it would be better for the floricultural students to take the course in the senior year.

**Forestry.**

Professor WILLIAM D. CLARK, Adviser.

Course.	Credit.
Forestry 3, . . . . .	3
Forestry 4, . . . . .	3
Forestry 5, . . . . .	5
Forestry 6, . . . . .	3
Entomology 5, . . . . .	3
Landscape Gardening 1, . . . . .	3
Horticulture 3, . . . . .	3
Horticulture 4, . . . . .	3
Botany 13, . . . . .	4
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	30

Students who propose to major in Forestry should elect Geology and Surveying in sophomore year.

**Landscape Gardening.**

Professor FRANK A. WAUGH, Adviser.

Course.	Credit.
Landscape Gardening 1, . . . . .	3
Landscape Gardening 2, . . . . .	3
Landscape Gardening 3, . . . . .	3
Landscape Gardening 4, . . . . .	3
Landscape Gardening 5, . . . . .	2
Landscape Gardening 6 or 10, . . . . .	2
Landscape Gardening 7, . . . . .	3
Landscape Gardening 8, . . . . .	3
Drawing 1, . . . . .	3
Drawing 2, . . . . .	3
Horticulture 3, . . . . .	3
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	31

Courses for juniors *only*: Landscape Gardening 1 and 2, Drawing 1 and 2.

Courses for seniors and graduates *only*: Landscape Gardening 3, 4, 7 and 8.

Courses open to juniors and seniors, both if possible: Horticulture 3 and 4.

This grouping of subjects is offered only as an example. Other groupings may be approved by the adviser, but such other groupings must be subject to the class schedule.

**Pomology.**

Professor FRED C. SEARS, Adviser.

Course.	Credit.
Pomology 1, . . . . .	3
Pomology 2, . . . . .	3
Pomology 3, . . . . .	3
Pomology 4, . . . . .	3
Pomology 5, . . . . .	3
Pomology 6, . . . . .	2
Botany 5, . . . . .	2
Agronomy 5, . . . . .	3
Entomology 1, . . . . .	3
Entomology 2, . . . . .	3
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**Agricultural Chemistry.**

Associate Professor CHARLES A. PETERS, Adviser.

Course.	Credit.
Chemistry 5, . . . . .	5
Chemistry 6, . . . . .	5
Chemistry 9, . . . . .	5
Chemistry 10, . . . . .	5
Chemistry 11, . . . . .	5
Chemistry 12, 14 or 16, . . . . .	5
Chemistry 13, . . . . .	3
Chemistry 15, . . . . .	3
Chemistry 18, . . . . .	2
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The major will consist of 30 credit hours selected from this list. The student will be advised concerning other subjects suitable to be taken in connection with Chemistry.

**Economic Entomology.**

Professor HENRY T. FERNALD, Adviser.

Course.	Credit.
Entomology 1, . . . . .	3
Entomology 2, . . . . .	2
Entomology 3, . . . . .	4
Entomology 4, . . . . .	4
Entomology 5, . . . . .	3
Entomology 8, . . . . .	3
Botany 3, . . . . .	4
Botany 4, . . . . .	3
Zoölogy 3, . . . . .	3
Zoölogy 4, . . . . .	3
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	32

A major in Economic Entomology does not necessarily include all the subjects given in this list, but may be varied to some extent, in accordance with the future plans of the student, other modifications being permissible.

**Microbiology.**

Professor CHAS. E. MARSHALL, Adviser.

Course.	Credit.
Microbiology 1 or 2, . . . . .	5
Microbiology 3 or 4, . . . . .	5
Microbiology 5 or 6, . . . . .	3
Microbiology 7 or 8, . . . . .	3
Chemistry 3, . . . . .	5
Chemistry 4, . . . . .	5
Chemistry 5, . . . . .	3
Chemistry 6, . . . . .	3
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	32

Courses 9 in Chemistry; 3, 4, 5 in Botany; 3, 4, 5, 6 in Zoölogy; 1, 3, 5, 6 in Veterinary Science, together with German and French, are suggested as collateral lines. Dairying 1 and Agronomy 5 are essential to a grasp of the larger problems involved in Microbiology as applied to Agriculture.



**Plant Physiology and Pathology.**Professor GEORGE E. STONE,<sup>1</sup> Adviser.

Course.	Credit.
Botany 3, . . . . .	4
Botany 4, . . . . .	3
Botany 9, . . . . .	4 or 5
Botany 10, . . . . .	4 or 5
Botany 11, . . . . .	4
Botany 12, . . . . .	4
Chemistry 5, . . . . .	5
Chemistry 6, . . . . .	5
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	33 or 35

**Agricultural Education.**

Professor WILLIAM R. HART, Adviser.

Course.	Credit.
Agricultural Education 1, . . . . .	3
Agricultural Education 2, . . . . .	3
Agricultural Education 3, . . . . .	3
Agricultural Education 4, . . . . .	3
Agronomy 3, . . . . .	3
Dairying 5, . . . . .	2
Farm Administration 3, . . . . .	3
Poultry Husbandry 1, . . . . .	2
Market Gardening 2, } . . . . .	3
Agronomy 5, . . . . .	
Botany 5, . . . . .	2
Pomology 1, . . . . .	3
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Some substitutions of other technical courses for some of the technical courses above mentioned will be made to meet the needs of individual students.

**Rural Social Science.**

Associate Professor ALEXANDER E. CANCE, Adviser.

Course.	Credit.
Economics and Sociology 1, . . . . .	3
Agricultural Economics 3, . . . . .	3
Agricultural Economics 7, . . . . .	3
Agricultural Economics 6 or 8, . . . . .	3
Rural Sociology 1, . . . . .	3
Rural Sociology 4, . . . . .	1
Rural Sociology 5, . . . . .	3
Rural Sociology 8 or 10, . . . . .	3
Rural Sociology 11, . . . . .	3
Farm Administration 4, . . . . .	3
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<sup>1</sup> On leave of absence; Associate Professor Osmun acting as head of Department of Botany.

## SUMMARY.

There are four preliminary steps which a student should take in arranging for his major work.

1. Select a major.
2. Confer with major adviser for arrangement of courses, the plan to be approved by adviser in accordance with Rule 5 previously stated.
3. Select courses covering the four semesters of the junior and senior years in such a way that a minimum of 12 credits will be taken in the two divisions, the Humanities and Rural Social Science; the distribution of all but 3 of these credits may be decided by the student.
4. Choose other courses so that the total number of credits for any semester shall be not less than 16 nor more than 21. (See Rules 2 and 3.)

## C. UNDERGRADUATE COURSES.

All courses given in the *first semester bear odd numbers*; all given in the *second semester bear even numbers*. Studies are pursued in courses, "course" implying the study given a subject within one semester, without regard to the total number of hours or to the number of credits. The special mention of certain courses as prerequisite to other courses does not imply that no courses but those so mentioned are "preliminary or preparatory" within the meaning of the Book of Rules.

## DIVISION OF AGRICULTURE.

Professor FOORD.

## AGRONOMY.

Associate Professor HASKELL, Dr. BROOKS, Assistant Professor McDONALD, Mr. MERKLE.

*Required Course.*

1. SOILS AND FERTILIZERS. — A study of the formation, classification and physical and chemical properties of soils. This is followed by study of methods of soil improvement and of maintenance of fertility, including the use of farm manures, commercial fertilizers and soil amendments. Prerequisites, Chemistry 1 and 2. Sophomores; 3 hours. Credit, 3.

Associate Professor HASKELL and Assistant Professor McDONALD.

*Elective Courses.*

3. FIELD AND FORAGE CROPS. — History, classification, production, harvesting, commercial grading and valuation. The crops studied are the cereal grains, grasses, legumes, forage and root crops suitable to New England conditions. The work includes lecture, laboratory and field study of these various crops. Prerequisites, Agronomy 1 and Botany 2. For juniors primarily; 1 lecture and 2 laboratory periods. Credit, 3.

Assistant Professor McDONALD.

4. ADVANCED FIELD CROPS. — Commercial production of grain, hay and root crops. Lecture, laboratory, and field study of the purity, quality, and vitality of the seed of these crops and the handling, grading and judging of their products. The work offered will not be confined to New England conditions. Prerequisite, Agronomy 3. For juniors primarily; 2 lectures and 1 laboratory period. Credit, 3. Assistant Professor McDONALD.

5. ADVANCED SOILS. — A field, laboratory and lecture course on soils, their nature, composition, physical qualities, improvement. Field work, as far as the season allows, consists of detailed soil surveys in different parts of the Connecticut valley; this followed by laboratory work on the physical properties of the soil collected, on the effect of fertilizers on the soil, and on the mixing of fertilizers. Prerequisite, Agronomy 1. For seniors primarily; 1 lecture period and 1 4-hour laboratory period weekly. Credit, 3.

Associate Professor HASKELL.

6. DRAINAGE AND IRRIGATION. — A field and lecture course on soil improvement, by drainage and irrigation. As a thesis each man is required, after studying an area of wet or swampy land, to present plans and estimates for its reclamation. Prerequisites, Agronomy 1 and Mathematics 6. Juniors and seniors; 1 lecture period and 1 4-hour laboratory period weekly. Credit, 3.

Associate Professor HASKELL.

8. MANURES AND FERTILIZERS. — An advanced course, giving a general discussion of the different theories which have been held relative to the functions and importance of manures and fertilizers, and leading up to the views at present accepted. Each of the important manures and fertilizers will be discussed, its origin and its chemical and physical characteristics being considered. Each material taken up will be studied in relation to its capacity to supply plant food and to its effects upon soil texture, moisture, temperature and flora. Considerable attention will be devoted to consideration of the experimental work which has been done, and which is now in progress, on manures and fertilizers. This course is intended for seniors only. Prerequisite, Agronomy 1; 3 lectures a week, with occasional seminars. Credit, 3.

Associate Professor HASKELL.

10. BREEDING OF FIELD CROPS. — This course deals with the improvement, by selection and breeding, of the crops studied in courses 3 and 4. Prerequisite, Agronomy 4. Seniors only; 2 lecture periods weekly. Credit, 2.

Associate Professor HASKELL.

#### ANIMAL HUSBANDRY.

Associate Professor McLEAN, Assistant Professor QUAIFFE.

##### *Required Course.*

2. MARKET CLASSES AND GRADES OF LIVE STOCK. — A study of the different market classes and grades of horses, cattle, sheep and swine. The purpose of this course is to familiarize beginners with the different classes of stock, and to give them a grounding in live stock judging. Text-book, Craig's "Live Stock Judging." Freshmen; 2 laboratory periods. Credit, 2.

Associate Professor McLEAN and Assistant Professor QUAIFFE.

##### *Elective Courses.*

3. BREEDS AND TYPES OF LIVE STOCK. — A course covering the origin, history, development and characteristics of the different breeds of horses, cattle, sheep and swine. Text-book, Plumb's "Breeds and Types of Farm Animals." Prerequisite, Animal Husbandry 2. Sophomores; 2 lectures and 2 laboratory periods. Credit, 4.

Associate Professor McLEAN and Assistant Professor QUAIFFE.

5. PRINCIPLES OF BREEDING. — This course is designed to familiarize the student with the problems involved in animal and plant improvement; to acquaint him with the facts which are already established; to scrutinize prevailing theories; and to indicate the lines and methods of further work. Some of the subjects studied are: variations, their causes and heritability; De Vrie's

theory of mutations; the inheritance of acquired characters; the pure line; Mendelian law; the making of new types; the determination of sex; applications to human heredity. A few periods at the end of the course are devoted especially to the application of principles in live stock improvement. Text, "Genetics," by Herbert E. Walter. Supplementary reading. Prerequisite, Zoölogy 1; 3 lectures. Credit, 3. Associate Professor McLEAN.

6. LIVE-STOCK MANAGEMENT. — The work of this course consists of laboratory work by the individual students in the handling of live stock; with horses, such work as halter breaking, breaking to drive, driving, harnessing, casting and fitting for show will be done; similarly, the practical handling of cattle, sheep and swine will be fully treated. Special study is given to halter making, splicing, hitches, knots and all rope work. Prerequisite, Animal Husbandry 3. Juniors; 1 laboratory period. Credit, 1.

Assistant Professor QUAIFFE.

8. ADVANCED STOCK JUDGING. — This course is designed to equip Animal Husbandry students in the judging of classes of different types of live stock; to strengthen them in the selection of superior sires; and equip them for stock judging at fairs. Visits will be made to the best herds for the various breeds of stock in the State. Judging teams to represent the college will be selected largely from this class. Must be preceded by or accompany Animal Husbandry 6. Juniors; 2 laboratory periods. Credit, 2.

Associate Professor McLEAN.

9. FEEDING AND MANAGEMENT. — A study of the principles of animal nutrition; of the composition and qualities of feeding materials; of the feeding, care and management of dairy cattle from birth to maturity, with especial attention to economic production. Text-book, Henry's "Feeds and Feeding." Prerequisite, Chemistry 5 or 7. Seniors; 3 lectures. Credit, 3.

Assistant Professor QUAIFFE.

10. FEEDING AND MANAGEMENT. — A continuation of Course 9, dealing in a similar manner with horses, sheep, beef cattle and swine. Prerequisite, Course 9. Seniors; 3 lectures. Credit, 3. Assistant Professor QUAIFFE.

11. HERD AND STUD-BOOK STUDY. — An advanced course in the study of the breeds of live stock, familiarizing the student with the detailed history of the breed, the most productive sires and dams of the various breeds, and the successful lines and methods of breeding. Prerequisites, Animal Husbandry 5 and 8. Seniors; 2 hours. Credit, 3. Associate Professor McLEAN.

12. SEMINAR. — Advanced study upon questions pertaining to live stock and live-stock production. Each student electing this work will choose some particular line of work in which he is specially interested, and will pursue study in this subject by reading, compilation and research. There will be no regular lecture period, but seminars will be held. A satisfactory report of the results must be presented in a thesis. Open only to seniors majoring in Animal Husbandry. Credit, 1. Associate Professor McLEAN.

**DAIRYING.**

Professor LOCKWOOD, Mr. COONS, Mr. BALDINGER.

*Elective Courses.*

1. MILK AND MILK COMPOSITION. — The development of the dairy business in the United States; the composition, secretion and general characteristics of milk; contamination and fermentation; the study of analysis of milk products by use of the Babcock test for fat, test for acidity and adulteration, and ordinary preservatives; moisture tests for butter; methods for testing herds and developing them to higher efficiency; problems. Two lecture hours and 1 2-hour laboratory period. Credit, 3.

Professor LOCKWOOD and Mr. COONS.

2. BUTTERMAKING. — A study of separators and cream separation; handling milk and cream for buttermaking; preparation of starters, and ripening cream; churning; markets and their requirements; marketing, scoring and judging butter; management; problems; dairy machinery and care thereof. Prerequisite, Course 1; 1 lecture hour and 2 2-hour laboratory periods. Credit, 3.

Professor LOCKWOOD, Mr. COONS and Mr. BALDINGER.

3. MARKET MILK AND MILK PRODUCTS. — A study of market milk conditions, extent and development of the business; supply and delivery; food value of milk and its use as food; milk and its relation to the public health; methods for the proper handling and preparing of milk and cream for direct consumption; certified milk, requirements and production; pasteurizing; sterilizing; standardizing and modifying; milk laws and inspection. The manufacture of milk products other than butter, including cheese, condensed milk, cottage cheese, casein, milk powder, ice cream, etc. Prerequisites, Dairying 1, and Bacteriology 1; 2 lecture hours and 1 2-hour laboratory period. Credit, 3.

Professor LOCKWOOD and Mr. BALDINGER.

4. DAIRYING. — A course designed primarily for teachers of secondary agriculture. The work given will cover briefly the composition and secretion of milk, the Babcock fat test, the relation of bacteria to dairy work and principles of creaming; separators; elementary buttermaking; proper methods of handling milk and cream; and the relation of market milk to the public health. One lecture hour and 2 2-hour laboratory periods. Credit, 3.

Professor LOCKWOOD.

**FARM ADMINISTRATION.**

Professor FOORD.

*Elective Courses.*

3. FARM BUILDINGS AND MACHINERY. — A study of the material equipment of the farm aside from the land; farm buildings, their location, plan and arrangement; water supply; fencing problems; farm power; farm machinery; wagons. Prerequisites, Agronomy 1, Animal Husbandry 2, Physics 1. Primarily for seniors; 2 laboratory periods and 1 lecture hour. Credit, 3.

Professor FOORD.

4. FARM MANAGEMENT. — The organization of the farm as a business enterprise. A discussion and study of some of the problems that confront the modern farmer, such as the choice of a farm, systems and types of farming, labor, marketing, records and farm accounts. Prerequisites, Agronomy 1 and 3, Animal Husbandry 2 or 3. Primarily for seniors; 2 lecture or recitation hours and 1 laboratory period. Credit, 3. Professor FOORD.

#### POULTRY HUSBANDRY.

Professor GRAHAM, Dr. GOODALE, Mr. PAYNE.

##### *Elective Courses.*

1. ELEMENTS OF POULTRY CULTURE. — This course consists of a comprehensive study of poultry-house construction, poultry-house equipment, winter-egg production, types and breeds of poultry. Juniors; 2 lectures. Credit, 2. Professor GRAHAM.

2. ELEMENTS OF POULTRY CULTURE. — This is a continuation of Course 1, treating the subjects of incubation, brooding, care of growing stock, market poultry, including capons, roasters and broilers, and diseases of poultry. Juniors; 2 lectures. Credit, 2. Professor GRAHAM.

3. POULTRY PRACTICE WORK. — This is a practical laboratory course in poultry carpentry, caponizing, killing and picking; dressing and packing poultry, sorting and preparing eggs for market. Must be preceded or accompanied by Course 1. Juniors; 1 laboratory period. Credit, 1. Mr. PAYNE.

4. INCUBATION AND BROODING. — In this course students are required to set up and operate incubators and brooders, make a systematic study of the development of the chick in the egg, and the care of sitting hens. This course must be preceded or accompanied by Course 2. Juniors; time to be arranged. Credit, 1 to 3. Mr. PAYNE.

6. POULTRY MANAGEMENT. — In this course a detailed study of large poultry farms and equipment, such as bone cutters, feed cutters, cramming machines, etc., will be carried on. It includes the laying out and planning of poultry buildings of all kinds, the mating of fowls, and the preparing of birds for exhibition. Attention to poultry diseases and investigation work carried on by experiment stations is prominent in this course. A few good poultry plants will be visited by the class for practical demonstrations. Prerequisites, Courses 1, 2, 3 and 4. Seniors; 2 lectures, 1 laboratory period. Credit, 3. Professor GRAHAM and Mr. PAYNE.

7. ADVANCED POULTRY JUDGING. — This course includes a study of the origin and history of breeds and varieties, poultry organizations and poultry shows. The American Standard of Perfection will be used as a text. Prerequisites, Courses 1, 2, 3, 4 and 5. Seniors; 1 lecture and 2 laboratory periods. Credit, 3. Mr. PAYNE.

8. INVESTIGATIONAL WORK. — This course is designed especially for students who are planning to do experiment station work. Students will be assigned specific problems to work out experimentally, or they may be required to assist in carrying on such work. Credit, 1 to 3. Dr. GOODALE.

9. MARKET POULTRY AND POULTRY PRODUCTS. — This course includes the study of market classifications of poultry, eggs and feathers; the requirements of different markets, methods of marketing, advantages and disadvantages of cold storage of poultry and eggs. Students will be required to fatten several lots of chickens by different methods and rations. Accurate data must be kept showing the gain in weight and quality, also the cost of feed, labor, etc., and the profit and loss. Judging and scoring of market poultry, both alive and dressed, and market eggs will be an important feature of this course. Prerequisites, Courses 1, 2 and 3. Seniors; 1 lecture or conference period and laboratory periods to be arranged. Credit, 3. Mr. PAYNE.

10. PEN MANAGEMENT. — This is a practical laboratory course. Students are required to care for a pen of fowls, keeping accurate records of eggs produced, food consumed, weather conditions, health of fowls, and profit and loss; must be preceded or accompanied by Course 1. Juniors; time to be arranged. Credit, 1. Mr. PAYNE.

#### RURAL ENGINEERING.

Associate Professor GUNNESS.

##### *Elective Courses.*

3. FARM STRUCTURES. — A study of the strength, durability and cost of building materials; location and planning of farm buildings; water supply; lighting and heating systems for the farm; drawing plans, writing specifications and estimating cost of buildings. Concrete construction as applied to foundations, silos, tanks, posts, floors and walks. One lecture and 2 laboratory periods. Credit, 3. Associate Professor GUNNESS.

4. FARM MACHINERY. — A study of the care and operation of tillage, seeding, harvesting, pumping and spraying machinery; steam and gas engines. Special attention will be given to the use of power on the small farm. Practice in the adjustment of the various machines, babbitting and fitting bearings, lining shafts and pulleys, lacing belts, splicing rope and packing valves. One lecture, and 2 laboratory periods. Credit, 3.

Associate Professor GUNNESS.



## DIVISION OF HORTICULTURE.

Professor WAUGH.

[The general subject of horticulture divides naturally into subjects of pomology, floriculture, forestry, landscape gardening and market gardening. A number of courses relate to more than one of these subjects, and are therefore grouped here under the general designation of horticulture.]

2. NURSERY PRACTICE. — This course treats of the fundamental methods of plant propagations by seeds, cuttings, budding, grafting, etc. Lectures and practicums. Sophomores, 1 lecture period and 1 laboratory period. Credit, 2. Assistant Professor CHENOWETH.

### *Elective Courses (General).*

3. PLANT MATERIALS. — This course aims to make the student familiar with the character of the trees, shrubs and herbaceous perennials used in ornamental work, and with the methods of propagating them. Prerequisite, Horticulture 2; 2 lecture periods and 1 laboratory period. Credit, 3.

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4. PLANT MATERIALS. — A continuation of Course 3, taking up the field use of trees, shrubs and herbaceous plants, their native habitats, soils and plant associations, with a view to supplying to students in landscape gardening and floriculture a knowledge of plant species. Frequent practicums and field excursions. Prerequisite, Horticulture 3; 2 lecture periods and 1 laboratory period. Credit, 3.

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6. PLANT BREEDING. — This course is designed to introduce advanced students to the best modern views of variation, heredity and evolution, and to the best methods of studying the phenomena found in these subjects. The principles educed apply to both animal breeding and plant breeding, but the laboratory work (of which there is considerable) is concerned chiefly with plant life. Some practice work in hybridization and selection is undertaken, and students are trained as far as possible in the practical application of those principles which have direct bearing on the breeding of plants and the cultivation of crops. Seniors and graduates; open only to students well prepared in agricultural or horticultural subjects; 2 lecture periods and 1 2-hour laboratory period. [Not given in 1914-15.] Credit, 3.

## FLORICULTURE.

Associate Professor NEHRING, Mr. THURSTON.

### *Elective Courses.*

1. GREENHOUSE MANAGEMENT. — This course is designed to familiarize students with the methods followed in the management of greenhouse crops. The students are instructed in the practical operation of glazing, concrete bench construction, watering, potting, fumigation, ventilating, and in the

methods of propagation of plants by seeds and cuttings. They will also be expected to arrange their hours according to the needs of the work. Prerequisite, Horticulture 2. Juniors; lectures 2, laboratory 6 hours. Credit, 5.  
Associate Professor NEHRLING, Mr. THURSTON.

2. GREENHOUSE MANAGEMENT. — Continuation of Course 1. In addition, work in the use of cut flowers and plants in decorative work, the arrangement of flowers in baskets, designs, vases, table and home decorations will be considered. The design, construction, cost, maintenance, heating, ventilating of greenhouse structures, and the draughting of specifications for commercial houses and private ranges will also be studied. Juniors; lectures 2, laboratory 6 hours. Credit, 5.  
Associate Professor NEHRLING, Mr. THURSTON.

3. COMMERCIAL FLORICULTURE. — A detailed study will be made of the methods of culture of greenhouse plants and cut flowers for wholesale and retail markets. The care and marketing of all florists' crops will also be considered. Assigned readings on these topics. Prerequisite, Floriculture 1 and 2. Seniors; lectures 2, laboratory 3 hours. Credit, 4.  
Associate Professor NEHRLING.

4. COMMERCIAL FLORICULTURE. — A continuation of Course 3. In addition, a study of the types of tropical and subtropical foliage and flowering plants used in conservatory work will be made. Prerequisite, Floriculture 1, 2 and 3. Seniors; lectures 2, laboratory 3 hours. Credit, 4.  
Associate Professor NEHRLING.

### FORESTRY.

Professor CLARK.

#### *Elective Courses.*

1. PRINCIPLES OF FORESTRY. — A lecture course for the purpose of giving the students a general view of the whole field of forestry and what forestry attempts to accomplish and has accomplished. Two lectures; juniors and seniors; not required of students who propose to major in forestry. Credit, 2.  
Professor CLARK.

2. WOOD TECHNOLOGY. — A study of the commercial woods found in the lumber markets, methods of identification, uses, strength values, technical qualities, decay and methods of preservation. Juniors; 1 lecture and 2 laboratory periods. Credit, 3.  
Professor CLARK.

3. DENDROLOGY. — During the first part of the semester frequent field trips will be made to identify and study the habits of our native forest trees. Later, the classification, range, distribution, forest habits, quality, uses and identification of wood of the commercial timber trees of the United States will be studied. Two 2-hour periods; lectures, recitations, laboratory or field work at option of instructor; juniors. Credit, 3.  
Professor CLARK.

4. **SILVICULTURE.** — Factors influencing forest growth; forest types; silvicultural systems; care and protection of forests; forest description; forest nursery practice and forest planting. Three lectures weekly until May 1; during May and June, 1 lecture and 1 4-hour field period weekly; juniors. Prerequisite, Forestry 3. Credit, 3. Professor CLARK.

5. **FOREST MENSURATION.** — Methods of determining the volume of trees, logs and entire forests. Methods of computing volume tables, tree and forest growth and yield tables. Timber estimating. Three lectures; 72 hours of field work; seniors. Credit, 5. Professor CLARK.

6. **SEMINAR — REPORT.** — This may involve research, laboratory or field work in the investigation of some subject, together with a review of the literature relating to it and an original written report evidencing the results. Subject to be chosen in conference with Professor Clark. Seniors. Credit, 3. Professor CLARK.

#### LANDSCAPE GARDENING.

Professor WAUGH, Assistant Professor HARRISON.

##### *Elective Courses.*

1. **ELEMENTS OF LANDSCAPE GARDENING.** — Reconnaissance surveys and mapping, with special reference to the methods used in landscape gardening; detailed study of selected designs of leading landscape gardeners; grade design, road design and field work. Students should have preparation in surveying, mathematics, plant materials and drawing. Must be followed by Course 2. Juniors; 6 hours a week. Credit, 3.

Assistant Professor HARRISON.

2. **ELEMENTS OF LANDSCAPE GARDENING.** — As stated under Course 1. Prerequisite, Course 1.

3. **GENERAL DESIGN.** — Field notes; examination of completed works and those under construction; design of architectural details, planting plans, gardens, parks and private grounds; written reports of individual problems. Seniors; prerequisites, Landscape Gardening 1 and 2, and either plant materials (Horticulture 3 and 4) or advanced mathematics; must be followed by Course 4; 6 hours. Credit, 3. Assistant Professor HARRISON.

4. **GENERAL DESIGN.** — As stated under Course 3. Prerequisite, Course 3.

5. **THEORY OF LANDSCAPE ART.** — The general theory and applications of landscape study, including a brief history of the art. Seniors and graduates; 2 hours. Credit, 2. Professor WAUGH.

6. **ARCHITECTURE.** — The history of architectural development, the different historic types, with special reference to the underlying principles of construction and design and their relations to landscape design. Illustrated lectures, conferences, practice in designing; 2 hours. (Alternating with Course 10 and not to be given in 1913-14.) Credit, 2.

Assistant Professor HARRISON.

7. **CIVIC ART.** — The principles and applications of modern civic art, including city design, city improvement, village improvement and rural improvement. Prerequisites, Courses 1, 2 and 3; must be followed by Course 8; 6 hours. Credit, 3. Professor WAUGH.

8. **CIVIC ART.** — As stated under Course 7. Prerequisite, Course 7.

10. **CONSTRUCTION AND MAINTENANCE.** — Detailed instruction in methods of construction and planting in carrying out plans, in organization, reporting, accounting, estimating, etc.; maintenance work in parks and on estates, its organization, management, cost, etc. (Alternating with Course 6.) Two hours. Credit, 2. Assistant Professor HARRISON.

### MARKET GARDENING.

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#### *Elective Courses.*

2. **ELEMENTS OF MARKET GARDENING.** — A course designed for an introduction to market gardening as a business. The work consists primarily of actual field experience in handling vegetable crops from seed to maturity. This is supplemented with lectures and text-book, in which a study of methods, soils, fertilization, tillage and management is made. Juniors; 5 hours. Credit, 3.

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3. **ADVANCED MARKET GARDENING.** — A continuation of the work begun in Market Gardening 2, taking up problems of seed growing, selection of varieties, crop management, harvesting, storage and marketing. A study is made of the greenhouse vegetable industry, and considerable time devoted to growing the special forced crops. Some time is given to a systematic study of vegetable description, classification and nomenclature. Collateral reading is required. Seniors; prerequisite, Market Gardening 2; 5 hours. Credit, 3.

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### POMOLOGY.

Professor SEARS, Assistant Professor CHENOWETH.

#### *Elective Courses.*

1. **PRACTICAL POMOLOGY.** — *General.* — A study of the general principles of the growing of fruits, dealing with such questions as selection of site, soils, windbreaks, laying out plantations, choice of nursery stock, pruning, etc. Text and reference books; field and laboratory exercises. Prerequisite, Horticulture 2. Juniors; 4 hours. Credit, 3. Professor SEARS.

2. **PRACTICAL POMOLOGY.** — *Special.* — The special application of the general principles discussed in Course 1 to the culture of the principal kinds of fruits, such as apples, pears, peaches, plums, cherries and quinces; grape culture and the culture of small fruits, such as blackberries, raspberries, currants, gooseberries and strawberries. Text-books, lectures and reference books; field and laboratory exercises. Prerequisites, Horticulture 2 and Pomology 1. Juniors; 4 hours. Credit, 3. Professor SEARS.

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<sup>1</sup> Mr. Harold F. Tompson temporarily in charge.

3. **SYSTEMATIC POMOLOGY.** — A study of the varieties of the different fruits and of nomenclature, with critical descriptions; special reference being given to relationships and classification. Text-books, laboratory and field exercises. Prerequisites, Horticulture 2 and Pomology 1 and 2. Seniors; 4 hours. Credit, 3.  
Assistant Professor CHENOWETH.

4. **SYSTEMATIC POMOLOGY.** — As stated under Course 3. Seniors; prerequisites, Horticulture 2, Pomology 1, 2 and 3; 4 hours. Credit, 3.  
Assistant Professor CHENOWETH.

5. **COMMERCIAL POMOLOGY.** — The picking, storing and marketing of fruits, including a discussion of storage houses, the picking, handling and storing of fruits, fruit packages, methods of grading and packing, manufacturing, etc. Especial emphasis is placed upon laboratory and field work, where the student is given actual practice in the picking and packing of all the principal fruits, together with the manufacture of by-products. Open only to men majoring in Pomology. Prerequisites, Horticulture 2, Pomology 1 and 2. Seniors; 1 lecture and 2 laboratory periods. Credit, 3.  
Assistant Professor CHENOWETH.

6. **SPRAYING.** — A study of (a) spraying materials, their composition, manufacture and preparation for use; the desirable and objectionable qualities of each material, formulas used, cost, tests of purity. (b) Spraying machinery, including all the principal types of pumps, nozzles, hose and vehicles; their structure and care. (c) Orchard methods in the application of the various materials used, with the important considerations for spraying each fruit and for combating each orchard pest. This course is designed especially to familiarize the student with the practical details of actual spraying work in the orchard. Spray materials are prepared, spraying apparatus is examined and tested, old pumps are overhauled and repaired, and the actual spraying is done in the college orchards and small fruit plantations. Prerequisites, Horticulture 2, Pomology 1 and 2. Seniors; 3 hours (1 lecture period and 1 laboratory period). Credit, 2.  
Professor SEARS.

#### **DRAWING.**

Mr. OBERHELMAN.

#### *Elective Courses.*

1. **FREE-HAND DRAWING.** — Lettering; free-hand perspective; sketching from type models, leaves, flowers and trees, houses, etc.; laying flat and graded washes in water colors; water color rendering of leaves, flowers and trees; conventional coloring and map rendering in water colors; conventional signs and mapping in ink. Juniors; 6 hours. Credit, 3.  
Mr. OBERHELMAN.

2. **MECHANICAL DRAWING.** — Inking exercises; geometric problems; projection; intersections, isometric; shades and shadows; parallel; angular and oblique perspective; perspective drawing of buildings. Students should have preparation in plane and solid geometry. Juniors; 6 hours. Credit, 3.  
Mr. OBERHELMAN.

## DIVISION OF SCIENCE.

Professor HENRY T. FERNALD.

### BOTANY.

Professor STONE,<sup>1</sup> Associate Professor OSMUN, Mr. McLAUGHLIN, Mr. SMITH, —————.

[The object of the courses in botany is to teach those topics pertaining to the science which have a bearing upon economic and scientific agriculture. Undergraduate work extending through five semesters is offered. Students sufficiently prepared are occasionally permitted to undertake special physiological and pathological investigations. A botanical conference is held monthly, wherein new problems in botanical science are considered by graduate students and the seniors who elect botany.]

#### *Required Course.*

2. GENERAL BOTANY. — The morphology, physiology and classification of plants. This course is fundamental. Its aim is to lay a foundation for the more specialized courses in botany which follow, and to provide a general knowledge of the science for those students who will not take further work in the department. This course is prerequisite to all other courses given by the department. In the laboratory much time is devoted to study of the structure of higher or seed plants. In this work first attention is given to the cell as the unit of structure; from the cell is traced the gradual development of the tissues of the entire plant. During the spring period of the semester much practice is given in determining and naming plants, Gray's "New Manual of Botany" being employed. In connection with this work each student is required to collect and prepare an herbarium of 75 species of plants. The lectures aim to amplify and interpret the laboratory work, dealing also with the function (physiology), classification (taxonomy) and ecology of plants. Though only 1 lecture period is scheduled for this course, it is understood that laboratory hours may be used for lectures at the discretion of the instructor. Sophomores; 1 lecture and 3 laboratory periods. Credit, 4.

Associate Professor OSMUN, Mr. McLAUGHLIN and Mr. SMITH.

#### *Elective Courses.*

3. CRYPTOGAMIC BOTANY. — Systematic study of typical forms of the lower plants (bacteria, algæ, fungi, lichens, mosses and ferns); instruction in laboratory technique and methods; field excursions for the purpose of observing environmental habits and collecting material for laboratory study; collateral reading. This course is intended for those students who wish to specialize in any of the biological sciences, and is a prerequisite of Courses 9, 10, 15 and 16. Students electing this course may attend the lectures in Course 5. Prerequisite, Course 2. Primarily for juniors. One lecture hour and 3 2-hour laboratory periods. Credit, 4.

Associate Professor OSMUN and Mr. McLAUGHLIN.

4. CRYPTOGAMIC BOTANY. — As stated in Course 3. Prerequisite, Course 3. One lecture hour and 2 2-hour laboratory periods. Credit, 2.

Associate Professor OSMUN and Assistant.

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<sup>1</sup> Absent on leave; Associate Professor Osmun acting as head of department.

5. DISEASES OF CROPS. — This course comprises a study of the common diseases of crops, their nature, causes and methods of prevention and control. In the laboratory macroscopic examinations of diseases are made, and the principal experiment-station and government literature on plant diseases is read. Intended especially for students majoring in agronomy, floriculture, landscape gardening and pomology. Prerequisite, Course 2. Primarily for juniors; 1 1-hour lecture and 1 2-hour laboratory period. Credit, 2.

Professor STONE, Mr. McLAUGHLIN and Mr. SMITH.

7. DISEASES OF CROPS. — This course is more specialized than Course 5, and is intended to meet the needs of the student who wishes to make a more thorough study of the diseases of the particular group or groups of crops in which his interest lies; *e.g.*, diseases of fruits, diseases of field crops, diseases of trees and shrubs. Laboratory work consists of microscopic and macroscopic examination of diseases, and extensive reading of literature concerning them. Prerequisite, Course 2. Students taking this course who have not previously taken Course 5 will attend the lectures in Course 5, and if they continue in botany the second semester, must take Course 8. Seniors; 1 lecture and 3 2-hour laboratory periods. Credit, 4.

Associate Professor OSMUN.

8. DISEASES OF CROPS. — As stated in Course 7. Prerequisite, Course 7.

9. PLANT PATHOLOGY. — This course embraces a comprehensive study of diseases of plants, including detailed training in laboratory methods and technique. Much time is devoted to the study of literature and representative life histories of pathogens, the making of pure cultures, and artificial inoculation of hosts. Students taking this course are fitted for civil service, experiment-station and college positions in plant pathology. Course 10 must follow. Prerequisites, Botany 2, 3 and 4. Seniors; 1 lecture and 4 2-hour laboratory periods. Credit, 5.

Associate Professor OSMUN.

10. PLANT PATHOLOGY. — As stated in Course 9. Prerequisite, Course 9.

11. PLANT PHYSIOLOGY. — This is a general course dealing with such topics as absorption, nutrition, growth, movement and the tropisms of plants, and requires previous training in organic chemistry and botany. Prerequisite, Botany 2. Seniors; 2 lectures and 3 2-hour laboratory periods. Credit, 4.

Professor STONE and Mr. McLAUGHLIN.

12. PLANT PHYSIOLOGY. — As stated in Course 11. Prerequisite, Course 11.

13. SHADE-TREE MANAGEMENT. — Physiology and pathology of shade-trees. This course includes a comprehensive study of the diseases, structure and functions of trees and shrubs, and of every agency which in any way affects shade-trees. Laboratory work and lectures; extensive reference reading. Designed for those students who intend to take charge of parks or large estates, or to become tree wardens, city foresters, landscape gardeners or professional advisers and caretakers. Prerequisite, Courses 2 and 5. Must be followed by Course 14. Seniors; 1 lecture period and 3 2-hour laboratory periods. Credit, 4.

Professor STONE and Mr. SMITH.

14. SHADE-TREE MANAGEMENT. — Physiology and pathology of shade-trees, as stated in Course 13. Prerequisite, Course 13.

15. HISTOLOGICAL TECHNIQUE. — This course comprises training in general histological methods, including the use of precision microtomes and various methods of killing, fixing, sectioning, staining and mounting of plant materials. This is a technical course in histology, of value to students intending to become research or teaching botanists. It is recommended for students taking Courses 9 and 10, as an aid to the study of relationship between host and parasite, and is open to those taking Courses 13 and 14, who desire to make their studies in tree structure more comprehensive. Collateral reading and conferences. Prerequisites, Botany 2, 3 and 4. Seniors; 3 or 5 2-hour laboratory and conference periods. Credit, 3 or 5.

Associate Professor OSMUN.

16. HISTOLOGICAL TECHNIQUE. — As stated in Course 15. Prerequisite, Course 15.

#### GENERAL AND AGRICULTURAL CHEMISTRY.

Professors LINDSEY, WELLINGTON and CHAMBERLAIN, Associate Professor PETERS, Associate Professor ANDERSON, Messrs. BOGUE, SEREX, ROBINSON, MILLER and GURLEY.

[The course in chemistry aims to teach accurate observation, logical thinking and systematic and constant industry. It likewise aims to give those students following the several agricultural occupations, or who are preparing themselves for work as teachers and investigators in the other sciences, a knowledge of the subject sufficient to enable them to apply it in their various lines of work. Students taking all of the undergraduate courses and intending following chemistry as a vocation are prepared for positions as instructors in high schools and colleges in the agricultural experiment stations, the United States Department of Agriculture, as well as in fertilizer, cattle food, sugar and dairy industries. Students are encouraged to take graduate work leading especially to the degree of M.Sc., and to thus prepare themselves for advanced positions as teachers in the agricultural colleges, as research chemists, and likewise for the more responsible positions connected with the different agricultural industries of the country. A fuller knowledge of the course of instruction will be found by consulting the following outline.]

#### *Required Courses.*

1A. GENERAL CHEMISTRY. — An introduction to the fundamental chemical laws, together with a study of the common acid-forming elements and their compounds. Text-book, Kahlenberg's "Outlines of Chemistry." This course is for those students who do not present chemistry for entrance, and who begin the subject in college. Freshmen; lectures, 2 hours; laboratory, 2 hours. Credit, 3.

Associate Professor PETERS, MESSRS. BOGUE and GURLEY.

1B. ADVANCED GENERAL CHEMISTRY. — A review of the fundamental chemical laws, together with the common acid and base-forming elements and their compounds. Text-book, Kahlenberg's "Outlines of Chemistry." The laboratory work takes the synthetic form. Substances of agricultural importance are prepared in quantity and studied in detail by the student. These include ammonium sulfate, superphosphate, muriate and sulfate of potash, arsenate of lead, Paris green, Bordeaux mixture, lime-sulfur and emulsions. In addition to these, preparations outlined in Blanchard's "Syn-



thetic Inorganic Chemistry" are made. This course is for students who present chemistry for entrance. Freshmen; lectures, 2 hours; laboratory, 2 hours. Credit, 3.

Associate Professor ANDERSON, MESSRS. BOGUE, GURLEY, MILLER, ROBINSON and SEREX.

2A. GENERAL CHEMISTRY. — A continuation of Course 1A. A study of metals and their compounds. The laboratory work is the same as described under 1B.

Associate Professor PETERS, Mr. BOGUE and Graduate Assistants.

2B. INORGANIC AGRICULTURAL CHEMISTRY. — A study of the chemical composition, properties and reactions of soils, fertilizers, fungicides and insecticides, and the common materials of construction, such as tile, brick, cements, paints, etc. Text-book, Fraps' "Principles of Agricultural Chemistry." The laboratory work is divided into three parts, as follows: (a) qualitative examination of soil, plant ash and superphosphate; (b) approximate quantitative determination of moisture, ash, carbonic acid, phosphoric acid, potash, etc.; (c) special work on retention of salts by soil, leaching of lime from the soil by carbonated water, etc. Prerequisite, Course 1B. Freshmen; lectures, 2 hours; laboratory, 2 hours. Credit, 3.

Associate Professor ANDERSON, Mr. BOGUE and Graduate Assistants.

#### *Elective Courses.*

3. QUALITATIVE ANALYSIS. — *Basic.* — A course in the systematic analysis of metallic salts, presented from the ionic viewpoint. The student studies closely the tests used in the separation and identification of the metals; he then applies these tests to unknown mixtures. Text, Medicus' "Qualitative Analysis," with Böttger's "Qualitative Analysis" and Treadwell-Hall's "Qualitative Analysis" for reference. Prerequisite, Course 2; should be taken, particularly, by all intending to follow chemistry as a vocation. Sophomores; lecture, 1 hour; laboratory, 4 hours. Credit, 3.

Associate Professor ANDERSON and Mr. SEREX.

4. QUALITATIVE ANALYSIS. — *Acidic.* — A continuation of Course 3. A large part of the semester is spent in the examination qualitatively of minerals and of agricultural products. Prerequisite, Course 3. Sophomores; lecture, 1 hour; laboratory, 4 hours. Credit, 3.

Associate Professor ANDERSON and Mr. SEREX.

5. ORGANIC CHEMISTRY. — This course, with Course 6, continues through the junior year. The two courses are designed especially: (1) for those who are looking forward to positions as chemists in agricultural colleges or experiment stations, the United States Department of Agriculture, or similar places, and who need a knowledge of chemistry for itself; and (2) for those who are expecting to enter like positions in other sciences, and who will use their knowledge of chemistry in a secondary way. It consists of a systematic study, both from texts and in the laboratory, of the more important compounds in the entire field of organic chemistry. Especial attention is given to those

compounds which are found in agricultural products or are manufactured from them. These include alcohols, acids, esters, fats, carbohydrates, proteins, etc. The work forms a foundation for courses in physiological chemistry and agricultural analysis, and thus for future work in agricultural chemical investigation. Prerequisites, Courses 1, 2, 3 and 4 (Course 3 or 4 will not be required as prerequisites for those majoring in other courses than chemistry). Juniors; those electing Course 5 are expected to elect Course 6. Lectures, 3 hours; laboratory, 4 hours. Credit, 5.

Professor CHAMBERLAIN and Mr. MILLER.

6. As stated under Course 5.

[AGRICULTURAL CHEMISTRY. — The two following courses in general agricultural chemistry are designed especially for students majoring in the different departments of the Divisions of Agriculture and Horticulture, and every effort is made to meet the demands of these departments. They are for students in practical agriculture, and not for those intending to take up scientific lines of work. They form an alternative group with either Courses 3 and 4 or 5 and 6.]

7. INORGANIC AGRICULTURAL CHEMISTRY. — The same as Course 2B. This course is designed for those men who have had only Courses 1A and 2A. Prerequisite, Courses 1A and 2A. Juniors; lectures, 2 hours; laboratory, 2 hours. Credit, 3. Associate Professor ANDERSON and Mr. SEREX.

8. ORGANIC AGRICULTURAL CHEMISTRY. — The course embraces the study of the most important groups of organic compounds of plants and animals, the composition of plants, the chemistry of plant growth, plants as food and as industrial material, the composition of animals, the chemistry of digestion, absorption and metabolism, animal nutrition, animal foods, rations, etc., and also the study of some of the products related to plants and animals, such as milk, butter, cheese, sugar, alcohol, wood pulp and paper. The treatment of the subject will be general, avoiding (so far as possible) complicated chemical facts and relationships, and endeavoring simply to make the student acquainted with the general chemistry of plants and animals and agricultural processes and products. Prerequisites, Courses 1 and 2. Juniors; lectures, 2 hours; laboratory, 2 hours. Credit, 3.

Professor CHAMBERLAIN and Mr. MILLER.

9. QUANTITATIVE ANALYSIS. — Instruction in this course includes the gravimetric and volumetric determinations of some of the commoner metals and non-metals in minerals and industrial products. Aside from teaching accurate observation and care in manipulation, it is intended for those who would learn the exact methods for determining the elements, particularly, in inorganic substances, and is the forerunner of other courses intended to fit men to become expert analysts. Talbot's "Quantitative Chemical Analysis" is used as a text. Prerequisites, Courses 1, 2 and 3 or 4. Juniors; lecture, 1 hour; laboratory, 8 hours. Credit, 5.

Professor WELLINGTON and Assistant.

10. AGRICULTURAL CHEMICAL ANALYSIS. — In this course and Course 11 the methods previously studied, and other approved methods, are applied to the examination of agricultural materials. The analysis of fertilizers, in-

secticides, fungicides and soils is followed by that of cattle foods, dairy products, sugars, starches and allied substances. Prerequisite, Course 9. Juniors; lecture, 1 hour; laboratory, 8 hours. Credit, 5.

Professor WELLINGTON and Assistant.

11. AGRICULTURAL CHEMICAL ANALYSIS. — As stated under Course 10. Prerequisite, Course 10. Seniors; lecture, 1 hour; laboratory, 8 hours. Credit, 5.

Associate Professor PETERS and Assistant.

*12, 14 and 16. See below, following Course 15.*

13. PHYSIOLOGICAL CHEMISTRY. — This course is intended to be supplementary to Courses 5 and 6 and Courses 7 and 8. To those who expect to take up scientific work in microbiology, botany, agronomy, animal husbandry, etc., and who have had Courses 5 and 6, it will give acquaintance with the chemistry of the physiological processes in plants and animals, by means of which some of the important organic compounds studied in Courses 5 and 6 are built up in the living organism or are used as food by it. In the lectures the study of food and nutrition as related to both human and domestic animals is the principal subject. In the laboratory, experimental studies are made of the animal body and the processes and products of digestion, secretion and excretion. The course gives additional training in the chemical problems of agricultural experiment station work, especially those connected with investigations in animal and plant nutrition. To those who will not take up scientific lines of work, but will follow practical agriculture, it will give an opportunity for a more detailed study of the chemistry and physiology of problems which were treated generally in Courses 7 and 8. Prerequisites, preferably, Courses 5 and 6 or 7 and 8. Seniors; lectures, 2 hours; laboratory, 2 hours. Credit, 3.

Professor CHAMBERLAIN and Mr. MILLER.

15. PHYSICAL CHEMISTRY. — A résumé of general chemistry from the viewpoint of physical chemistry and the application of physical chemistry to agricultural chemistry. Prerequisite, Course 9. Seniors; lectures, 2 hours; laboratory, 2 hours. Credit, 3.

Associate Professor ANDERSON and Mr. SEREX.

[GENERAL STATEMENT CONCERNING COURSES 12, 14 AND 16. — Each student electing either of these courses will be required to take up and follow out some special line of work, the object being to acquaint him with methods of original inquiry. A single concrete example may be found in a comparative study of the different methods for the determination of the several forms of nitrogen. A thesis may not be required, but frequent consultation of the literature bearing on the subject will be necessary. These courses are valuable for all chemists, and particularly so for those intending to take up experiment station work. A student may choose any one but not two of these separate courses.]

12. SPECIAL WORK IN AGRICULTURAL CHEMICAL ANALYSIS. — The student is given a problem to solve either in analytical chemistry or related to the agricultural industries. This will acquaint him with the methods used in research and with the literature, and show him how to handle problems in this field of chemistry when occasion arises.

Associate Professor PETERS.

14. SPECIAL WORK IN PHYSIOLOGICAL AND ORGANIC AGRICULTURAL CHEMISTRY. — In this course, as in Courses 12 and 16, the student will be able to give his attention primarily to one line of chemical study. To those whose tastes and interests are in connection with the organic and physiological problems of agricultural chemistry, many subjects of study present themselves, among which may be mentioned: proteins, carbohydrates, fats, organic nitrogenous compounds in fertilizers and soils and their relation to plants, the commercial production of alcohol from agricultural products, digestion and dietary studies, the chemical study of dairy products, etc. Prerequisites, Courses 5, 6 and 13. Seniors; laboratory, 10 hours. Credit, 5.

Professor CHAMBERLAIN.

16. SPECIAL WORK IN PHYSICAL CHEMISTRY. — The field of agricultural chemistry offers many problems that have been attacked through the methods of physical chemistry; such, for example, are the hydrolysis of salts and of minerals and the absorption of salts and fertilizers by soils. Each student will select one line of work and follow it through the course, repeating some of the original work. Prerequisite, Course 15. Laboratory, 10 hours. Credit, 5.

Associate Professor ANDERSON.

18. HISTORY OF CHEMISTRY. — An exposition of the development of chemical knowledge from the earliest times to the present. Although the entire history will be included, the larger portion of it will receive only brief mention in order that the questions of vital interest in modern life and industry may be studied at greater length. Particular attention will be given to the questions of plant and animal industry. Chemists are strongly advised to take this course. Seniors; lectures, 2 hours. Credit, 2.

Professor WELLINGTON.

#### ENTOMOLOGY.

Professor FERNALD, Associate Professor CRAMPTON, Associate Professor GATES, Mr. REGAN, Mr. MARTIN, ———.

#### *Elective Courses.*

1. GENERAL AND ECONOMIC ENTOMOLOGY. — Course 1 comprises a general introduction to the study of insects, including studies on their structure as applied to their identification; the principles of classification; a systematic examination of the different groups and of the most important economic insects of each group, including their life histories and habits, recognition of their work as shown in the collections, and methods for their control. The most important insecticides and their preparation and application are also treated. Students electing Course 1 are expected to take Course 2. Juniors; 3 lecture periods. Credit, 3.

Professor FERNALD.

2. GENERAL AND ECONOMIC ENTOMOLOGY. — A continuation of Course 1, with laboratory and field work on methods of collecting, preserving and studying insects and their work. Juniors; 2 laboratory or field periods. Credit, 2.

Professor FERNALD.

3. ADVANCED ENTOMOLOGY. — This course is subdivided, the time spent on the various subdivisions differing somewhat according to the particular

needs of those taking it; and it is to a large degree given in the form of individual instruction, special attention being paid to the pests attacking the particular crops in which the student is most interested. The student may specialize in fruit pests, market-garden pests, greenhouse pests, field crop pests, etc., to a large extent, in accordance with his plans for future work.

A. *Morphology*. — Careful studies of the structure of insects belonging to each of the larger and more important orders, together with lectures on the subject, followed by the identification of insects of each of these groups and the study of the collections, to teach the use of the analytical tables and of structural characters in the determination of insects.

B. *Histology*. — Lectures on the internal anatomy and histology of the various organs, with particular reference to those affected by the various insecticides.

C. *Insecticides and Apparatus*. — Lectures on the chemistry, preparation and application of the different insecticides, their merits and defects; tests for detecting adulterations; comparative tests of nozzles and other apparatus; and a study of other methods of insect control, together with laboratory work.

D. *Coccidology*. — Lectures and laboratory work on methods of preserving, mounting and identifying scale insects, particular attention being given to those of greatest economic importance.

E. *Bibliography*. — Studies of the various entomological publications and of the methods of finding the literature on any insect.

F. *Special Studies*. — In these studies the insects most closely related to the future occupation of the student will receive attention. The results of these studies are brought together in the form of an essay or thesis; this will include all the essentials of what is known of the life history, habits and injuries caused by each insect studied, together with methods of treatment, and a list of the best articles found in the course of the work. Comstock's "Manual for the Study of Insects" is used in the laboratory work. Seniors; prerequisite, Entomology 2; students electing Course 3 are expected to take Course 4; 1 1-hour lecture period and 3 2-hour laboratory or field periods. Credit, 4.

Professor FERNALD, Associate Professor CRAMPTON, Mr. MARTIN.

4. **ADVANCED ENTOMOLOGY**. — As stated in Course 3. Prerequisite, Course 3.

5. **FOREST AND SHADE-TREE INSECTS**. — A study of the insects injurious to forest and shade trees, and of methods for their control, with laboratory and field work on these insects, and a study of what has been published about them. Seniors; prerequisites, Entomology 1 and 2; 1 lecture and 2 2-hour laboratory or field exercises. Credit, 3. Professor FERNALD.

8. **BEEKEEPING**. — This course comprises a general consideration of the biology of the honey bee and the elements of practical beekeeping. Some topics covered are: life history, general behavior and instincts, structure, products, relations of bees to plants, the honey flora. The course aims particularly to afford first-hand, practical experience with bees, to the end of enabling their proper maintenance for any purpose, horticultural, educational

or apicultural. Bee diseases, a thorough understanding of which is fundamental, are emphasized. So far as possible the work is made individual in constructing materials and apparatus and in the manipulation of bees. Juniors; seniors may elect. Courses 1 and 2 form a desirable preparation; 2 lectures, 1 2-hour laboratory period. Credit, 3.

Associate Professor GATES and Mr. —.

10. **ADVANCED BEEKEEPING.** — This course deals with the advanced and special problems of the beekeeper. Besides considering those difficulties which at present confront the industry, subjects necessarily of limited treatment in the previous course are expanded for the development of particular technique and manipulation. Apiary management, including the principles of queen rearing, are practiced. The course should further qualify for apicultural instruction and inspection service, affording familiarity with the special literature and methods needed in investigation and research. The policy of individual instruction is continued in so far as practicable. Primarily for seniors, but juniors may elect; prerequisite, Course 8; 1 lecture, 1 2-hour laboratory period. Credit, 2.

Associate Professor GATES and Mr. —.

11. **EVOLUTION.** — In order to demonstrate the universal scope and operation of the laws of evolution, the course includes a brief sketch of the probable origin and evolution of matter as viewed in the light of modern physical and chemical research; the evolution of the solar system, leading to the formation of the earth; the changes in the earth, preparatory to the production of life; the physical and chemical basis of life; the probable steps in the formation of living matter, and the theories concerning it; the evolution of living things; the appearance of man; his future in the light of his past development; and the evolution of human institutions and ideas. Consideration is also given to the theories concerning the factors of evolution, the general problems of heredity and similar topics. The course closes with a brief discussion of the philosophical, moral and social aspects of the problems involved, and the influence of the idea of evolution upon modern thought. The lectures are supplemented by collateral reading; and a portion of the time is used for the purpose of demonstration, or discussion by the class. Seniors; juniors may elect. Two lecture periods. Credit, 2. Associate Professor CRAMPTON.

#### MATHEMATICS AND CIVIL ENGINEERING.

Professor OSTRANDER, Assistant Professor DUNCAN, Assistant Professor MACHMER, Mr. HAZELTINE.

##### *Required Courses.*

1. **HIGHER ALGEBRA.** — A brief review of radicals, quadratic equations, ratio and proportion, and progressions; graphs, binomial theorem, undetermined coefficients, summation of series, variation, continued fractions, determinants, permutations and combinations, logarithms, theory of equations. Reitz and Crathorne's "College Algebra." Freshmen; 3 hours a week. Credit, 3.

Assistant Professor DUNCAN, Assistant Professor MACHMER,  
Mr. HAZELTINE.

2. HIGHER ALGEBRA. — As stated under Course 1.

Assistant Professor MACHMER.

3. SOLID GEOMETRY. — Theorems and exercises on the properties of straight lines and planes, dihedral and polyhedral angles, prisms, pyramids and regular solids; cylinders, cones and spheres; spherical triangles and the measurement of surfaces and solids. Wentworth and Smith's "Solid Geometry." Freshmen; required unless accepted for admission; 2 hours a week. Credit, 2.

Assistant Professor DUNCAN, Assistant Professor MACHMER,  
Mr. HAZELTINE

4. PLANE TRIGONOMETRY (in charge of Department of Physics). — The trigonometric functions as lines and ratios; proofs of the principal formulas, transformations; inverse functions, use of logarithms; the applications to the solution of right and oblique triangles; practical applications. Bowser's "Elements of Plane and Spherical Trigonometry." Freshmen; 3 hours. Credit, 3.

Professor HASBROUCK and Assistant Professor ROBBINS.

*Elective Courses.*

5. MENSURATION AND COMPUTATION. — The course includes a review of methods of computation, with special emphasis on short and abbreviated processes, together with methods of checking computations and of forming close approximations; use of slide rule. Also the graph, mensuration of plane and solid figures, weights and measures and elementary mechanism. Numerous practical problems are selected from such subjects as the following: the mathematics of woodworking; rough lumber; general construction; forestry methods in heights of trees; pulleys, belts and speeds; power and its transmission; dairying; agronomy; computation of areas from simple measurements. Primarily for juniors; 3 hours. Credit, 3.

Assistant Professor MACHMER.

6. PLANE SURVEYING. — The elements of the subject, including the adjustment and use of the usual instruments. Text-book and lectures. Sophomores; 6 hours a week. Credit, 3.

Professor OSTRANDER, Assistant Professor DUNCAN,  
Mr. HAZELTINE.

7. ANALYTIC GEOMETRY. — A discussion of the geometry of the line, the circle, of conic sections and of the higher plane curves. Fine and Thompson's "Coördinate Geometry." Prerequisites, Mathematics 1, 2, 3 and 4. Primarily for juniors; 3 hours a week. Credit, 3.

Professor OSTRANDER.

8. DIFFERENTIAL AND INTEGRAL CALCULUS. — A first course in the subject, with some of the more important applications. Nichol's "Differential and Integral Calculus." Prerequisites, Mathematics 1, 2, 3, 4 and 7. Primarily for juniors; 5 hours. Credit, 5.

Assistant Professor DUNCAN.

10. **ROADS AND RAILROADS.** — Topographic and higher surveying, highway construction, earthwork, pavements and railroad construction. Text-book and lectures; 6 hours. [Not given in 1914-15.] Credit, 5.

Professor OSTRANDER.

11. **HYDRAULICS AND SANITARY ENGINEERING.** — Hydrostatics, theoretical hydraulics, orifices, weirs, pipes, conduits, water supply, hydraulic motors, sewers and sewage treatment. Text-book and lectures; 3 hours. [Not given in 1914-15.] Credit, 3.

Professor OSTRANDER.

12. **ELEMENTARY STRUCTURES.** — An elementary course in roofs and bridges. Text-book and lectures; 6 hours. Credit, 5.

Professor OSTRANDER.

13. **MATERIALS OF CONSTRUCTION, FOUNDATIONS AND MASONRY CONSTRUCTION.** — Text-book and lectures; 4 hours. Credit, 3.

Professor OSTRANDER.

15. **APPLIED MECHANICS.** — A course in applied mechanics, based on the calculus, with problems. Text-books and lectures. Prerequisite, Mathematics 8; 3 hours. Credit, 3.

Professor OSTRANDER.

#### MICROBIOLOGY.

Professor MARSHALL, Associate Professor VAN SUCHTELEN, Mr. ITANO, [Mr. DAVIES],  
Mr. AVERY.

[Courses 1 and 3 (= 2 and 4) are especially adapted to those who wish a general, comprehensive, although elementary, survey of agricultural microbiology.]

#### *Elective Courses.*

1. **MORPHOLOGICAL, CULTURAL AND PHYSIOLOGICAL MICROBIOLOGY.** — Types of micro-organisms, technic of handling, methods of culture and functions of micro-organisms are considered. This course is elementary and fundamental to all applied and special microbiological studies, and therefore is made a prerequisite to all courses offered; 2 hours or 2 credits are assigned to lectures, text-book requirements and recitations; this time will be scheduled. Six hours or 3 credits are assigned to laboratory exercises; only 1 hour of the 6 is scheduled, the remaining 5 hours are arranged with the instructor. Open to juniors and seniors. Credit, 5.

The DEPARTMENT.

2. As stated under Course 1, which it repeats.

3. **AGRICULTURAL MICROBIOLOGY.** — This general comprehensive course is designed to cover in an elementary manner those subjects only which confront the student of general agriculture, — the microbiological features of air, water, sewage, soil, dairy, fermentations, food, vaccines, antisera, microbial plant infections, methods and channels of infections, immunity and susceptibility, microbial infections of man and animals, methods of control or sanitary and hygienic practices. These subjects will be demonstrated by illustrative and typical laboratory exercises, which for each subject, on account of time limitations, must be very elementary and greatly restricted. Prerequisite, Microbiology 1 or 2. Two hours or 2 credits are assigned to lectures, text-



book requirements and recitations; this time will be scheduled. Six hours or 3 credits are assigned to laboratory exercises; only 1 hour of the 6 is scheduled; the remaining 5 hours are arranged with the instructor. Open to juniors and seniors. Credit, 5.

The DEPARTMENT.

4. As stated under Course 3.

5. **ADVANCED MORPHOLOGICAL, CULTURAL AND PHYSIOLOGICAL MICROBIOLOGY.** — The purpose of this course is to prepare the student for a more intimate knowledge of microbiological agricultural problems. To accomplish this object it is necessary to provide more advanced technic and methods of culture, together with a more extensive knowledge of micro-organisms and their functions. Prerequisites, Microbiology 1 or 2, 3 or 4; Chemistry 5 and 6. Six hours or 3 credits are assigned to laboratory exercises; only 1 hour of the 6 is scheduled; the remaining 5 hours are arranged with the instructor. Open to juniors and seniors in the fall and spring semesters. Credit, 3.

The DEPARTMENT.

6. As stated under Course 5.

7. **ADVANCED AGRICULTURAL MICROBIOLOGY.** — A knowledge of the subjects mentioned in Courses 3 and 4 cannot be obtained without a more extensive training in microbiological practices, as found in Courses 5 and 6. Prerequisites, Microbiology 1 or 2, 3 or 4, and 5 or 6; Chemistry 5 and 6. Six hours or 3 credits are assigned to the laboratory exercises; only 1 hour of the 6 is scheduled; the remaining 5 hours are arranged with the instructor. Open to juniors and seniors in the fall and spring semesters. Credit, 3.

The DEPARTMENT.

8. As stated under Course 7.

9. **SOIL MICROBIOLOGY.** — Such subjects as the number and development of micro-organisms in different soils; the factors which influence their growth, food, reaction, temperature, moisture and aeration; the changes wrought upon inorganic and organic matter in the production of soil fertility, ammonification, nitrification and denitrification; fixation of nitrogen symbiotically and non-symbiotically; methods of soil inoculation receive attention. Prerequisite, Microbiology 1 or 2. Six hours or 3 credits are assigned to laboratory exercises; only 1 hour of the 6 is scheduled; the remaining 5 hours are arranged with the instructor. Open to juniors and seniors. Credit, 3.

The DEPARTMENT.

10. As stated under Course 9.

11. **DAIRY MICROBIOLOGY.** — Special emphasis will be placed upon milk supplies. The microbial content of milk, its source, its significance, its control; microbial taints and changes in milk; groups or types of organisms found in milk; milk as a carrier of disease-producing organisms; the value of straining, aeration, centrifugal separation, temperature, pasteurization; the abnormal fermentations of milk; bacteriological milk standards and their interpretation; ripening of milk and cream; the bacterial content of butter; a passing survey of the microbiology of cheeses; a study of special dairy products, as ice cream, condensed milk, artificial milk drinks (the products of microbial actions), represents a list of topics considered. Prerequisite, Micro-

biology 1 or 2, and Dairying 1 (see Dairying 3). Six hours or 3 credits are assigned to laboratory exercises; only 1 hour of the 6 is scheduled; the remaining 5 hours are arranged with the instructor. Open to juniors and seniors. Credit, 3. The DEPARTMENT.

12. As stated under Course 11.

13. **FOOD MICROBIOLOGY.**— A study of food preservation by means of drying, canning, refrigerating and addition of chemicals will be pursued. Food fermentations, as illustrated by bread, pickles, sauerkraut, ensilage, vinegar, wine, etc., will be examined. Decomposition of foods, as may be seen in meat, oysters, fish, milk, etc., as well as diseased foods, will receive consideration. Contamination of food supplies by means of water, handling, exposure, diseased persons, etc., is of especial significance and will be demonstrated by laboratory exercises. Prerequisite, Microbiology 1 or 2. Six hours or 3 credits are assigned to laboratory exercises; only 1 of the 6 is scheduled; the remaining 5 hours are arranged with the instructor. Open to juniors and seniors. Credit, 3. The DEPARTMENT.

14. As stated under Course 13.

15. **HYGIENIC MICROBIOLOGY.**— An attempt will be made to select for this course certain material which should be the possession of every individual, and which is basic to public hygiene and sanitation, as applied to man and animals. The microbiology of water supplies, food supplies, vaccines, antisera or antitoxins; the channels by which micro-organisms enter the body, the influence of body fluids and tissues upon them, body reactions with micro-organisms (susceptibility and immunity); the micro-organisms of some of the most important infectious diseases, methods of control, including disinfectants and disinfection, antiseptics, antiseptics and asepsis will be treated. Prerequisite, Microbiology 1 or 2. Six hours or 3 credits are assigned to laboratory exercises; only 1 of the 6 is scheduled; the remaining 5 hours are arranged with the instructor. Open to juniors and seniors. Credit, 3.

The DEPARTMENT.

16. As stated under Course 15.

### PHYSICS.

Professor HASBROUCK, Assistant Professor ROBBINS.

[The fundamental and basic importance of the laws and phenomena of physics makes necessary no explanation of the introduction of this subject into the curriculum of an agricultural college. The logical development of the subject emphasizes the importance of physics as a science in itself. Special emphasis is laid, however, on the correlation of the principles studied with the sciences of agriculture, botany, chemistry, zoölogy, thus furnishing an extra tool by use of which the student's work in all the subjects may be more effective.]

#### *Required Course.*

1. **GENERAL PHYSICS.**— General physics covers mechanics of solids, mechanics of fluids, wave motion and heat. These topics are chosen for the required work because they are regarded as the most fundamental of all, and there is no part of the work in physics more necessary for the student who plans to take up practical farming. Course given by text-book and lectures. Sophomores; 4 hours class-room work and 1 laboratory period. Credit, 5. Professor HASBROUCK and Assistant Professor ROBBINS.

*Elective Courses.*

2. **GENERAL PHYSICS.** — Electricity and light. Text-book, lectures, recitations and laboratory work. Sophomores; 2 hours of class-room work and 1 laboratory period. Credit, 3. Assistant Professor ROBBINS.

3. **ELECTRICITY, HEAT AND LIGHT.** — Three-hour lecture and laboratory course open to juniors and seniors; 1 lecture hour and 2 2-hour laboratory periods. Credit, 3. Assistant Professor ROBBINS.

4. Continuation of Course 3, open to juniors and seniors; 1 lecture hour and 2 2-hour laboratory periods. Credit, 3. Assistant Professor ROBBINS.

[Mathematics 4 (trigonometry) is, for convenience of grouping, listed under mathematics, although in charge of the Department of Physics.]

**VETERINARY SCIENCE.**

Professor PAIGE, Associate Professor GAGE.

[The courses in veterinary science have been arranged to meet the needs of students who propose following practical agriculture, and of prospective students of human and comparative medicine.]

*Elective Courses.*

1. **VETERINARY HYGIENE AND STABLE SANITATION.** — This course is intended to familiarize the student with the relation of water, food, air, light, ventilation, care of stables, disposal of excrement, individual hygiene, etc., to the prevention of disease in farm animals. Juniors and seniors; 3 hours. Credit, 3. Professor PAIGE.

2. **GENERAL VETERINARY PATHOLOGY, MATERIA MEDICA AND THERAPEUTICS.** — In this course such fundamental and general pathological conditions are studied as inflammation, fever, hypertrophy, atrophy, etc., a knowledge of which is essential in the diagnosis, prevention and treatment of disease. The course in pathology is followed by one in materia medica and therapeutics, dealing with the origin, preparation, pharmacology, pharmacy, administration and therapeutic use of the more common drugs. Poisonous plants and symptoms and treatment of plant poisoning are also considered. Juniors and seniors; 3 hours. Credit, 3. Professor PAIGE.

3. **COMPARATIVE (VETERINARY) ANATOMY.** — The anatomy of the horse is studied in detail, and that of other farm animals compared with it where differences exist. This course is essential for those students wishing to elect Course 4. Juniors and seniors; 3 hours. Credit, 3. Professor PAIGE.

4. **THEORY AND PRACTICE OF VETERINARY MEDICINE; GENERAL, SPECIAL AND OPERATIVE SURGERY.** — A course intended to familiarize the student with the various medical and surgical diseases of the different species of farm animals. Particular attention is given to diagnosis and first-aid treatment. The student is taught the technic of simple surgical operations that can with safety be performed by the stock owner. This course should be preceded by Course 3, and taken in conjunction with Course 2. Lectures, demonstrations and practice. Juniors and seniors; 3 hours. Credit, 3.

Professor PAIGE.

5. **ESSENTIALS OF GENERAL PATHOLOGY.** — This course is planned to introduce the student to some of the essential anatomical, histological and general physiological phenomena essential to the understanding of some of the simple general pathological conditions found in domestic animals. Some of the common methods of diagnosis will be considered in the laboratory. The various chemical and biological reactions and tests will be presented from the standpoint of pure science, showing applications of chemistry and biology. The course will serve to liberally educate and stimulate in the student of agriculture the appreciation of some of the methods used in animal pathology for detecting and controlling some of the more common animal diseases. Lectures, demonstration and laboratory work. Juniors and seniors; 2 3-hour laboratory periods. Credit, 3. Associate Professor GAGE.

6. **ESSENTIALS OF GENERAL ANIMAL PATHOLOGY.** — This is a continuation of Course 5, and is devoted to a study of some of the common pathological conditions by means of prepared sections, the aim being to demonstrate to the student abnormal animal histological structures commonly observed when material from various cases of animal diseases is prepared for microscopical study. Some of the biological products used in protecting animals against disease will be considered. Juniors and seniors; 2 3-hour laboratory periods. Credit, 3. Associate Professor GAGE.

7. **AVIAN PATHOLOGY.** — A course in poultry diseases. The object of this course is to present information concerning the common diseases of poultry, their etiology, diagnosis and prevention. The work will consist of a systematic study of the diseases of the alimentary tract, liver and abdominal region, followed by a study of the diseases of the respiratory system, circulation and kidneys. The important disease-producing external and internal parasites will be considered; also diseases of the skin and reproductive organs. Lectures and demonstrations. Juniors and seniors; 2 3-hour laboratory periods. Credit, 3. Associate Professor GAGE.

8. **AVIAN PATHOLOGY.** — A continuation of Course 7, devoted to the study of some of the special diseases of poultry. Recent methods used in the control of these diseases will be considered, and opportunity offered the student for demonstrating various disease processes by means of prepared slides. Lectures, demonstrations and laboratory work. Juniors and seniors; 2 3-hour laboratory periods. Credit, 3. Associate Professor GAGE.

## ZOÖLOGY AND GEOLOGY.

Associate Professor GORDON, Mr. BLANCHARD.

### ZoöLOGY.

#### *Required Course.*

1. **ELEMENTARY ZoöLOGY.** — This course presents the underlying principles of biology and the zoölogical part of an introductory course. Laboratory dissection and lectures. Sophomores; 1 lecture hour and 2 2-hour laboratory periods. Credit, 3.

Associate Professor GORDON and Mr. BLANCHARD.

*Elective Courses.*

3. INVERTEBRATE OR VERTEBRATE ZOÖLOGY. — These are separate courses running throughout the year. The student may elect one or the other, but not both in the same year. The course in invertebrate zoölogy is designed primarily for students who are planning to take up entomology, but is open to any one. The course in vertebrate zoölogy deals with comparative vertebrate anatomy and physiology and is designed for those who desire or require a knowledge of the comparative anatomy and physiology of vertebrated animals. Each course includes laboratory, text-book and lecture work. These courses are scheduled in the junior year, but are open to seniors; hours by arrangement. Credit, 3. Associate Professor GORDON.

4. INVERTEBRATE OR VERTEBRATE ZOÖLOGY. — The continuation and completion of Course 3 of the first semester; hours by arrangement. Credit, 3. Associate Professor GORDON.

5. ELEMENTS OF HISTOLOGY. — This course gives the theories and methods of preparing normal animal tissues for microscopic examination. Chiefly laboratory work, with reading and occasional seminars. Open to juniors and seniors. Hours by arrangement; see below, Course 6. Credit, 2.

Mr. BLANCHARD or Associate Professor GORDON.

6. ELEMENTS OF HISTOLOGY. — In Course 6 the student may carry forward the work of the first semester, thereby completing a year's work, or may take the work outlined for Course 5. Open to juniors and seniors. Hours by arrangement. Credit, 2.

Mr. BLANCHARD or Associate Professor GORDON.

7. ADVANCED ZOÖLOGY.<sup>1</sup> — Special elective work in advanced zoölogy is offered to seniors who are interested in zoölogy or who are looking forward to advanced work in any department of zoölogy or allied branches; hours by arrangement. Credit, 5.

Associate Professor GORDON and Mr. BLANCHARD.

8. ADVANCED ZOÖLOGY.<sup>1</sup> — This course may be a continuation of the work of the first semester or of separate character; hours by arrangement. Credit, 3.

Associate Professor GORDON and Mr. BLANCHARD.

## GEOLOGY.

*Elective Course.*

2. ELEMENTARY GEOLOGY. — Rock-forming minerals; rock types; rock weathering; dynamical, structural and surface geology. Lectures, map and field work. Sophomores; 1 1-hour period and 2 2-hour periods. Credit, 3.

Associate Professor GORDON and Mr. BLANCHARD.

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<sup>1</sup> The work offered in Courses 3, 4, 7 and 8 may apply on a minor for the degrees of master of science or doctor of philosophy.

**DIVISION OF THE HUMANITIES.**

Professor SPRAGUE.

**ECONOMICS AND SOCIOLOGY.**

Professor SPRAGUE.

[The courses in Economics and Sociology are planned with the purpose of giving the student that knowledge and understanding of the important factors and problems in this field of study and life which every active citizen and educated man ought to have.]

*Elective Courses.*

1. **POLITICAL ECONOMY.** — An introductory course which takes up the study of the nature and scope of economics, the evolution and organization of the present economic system, and the fundamental principles of production, exchange and consumption. The class will study and discuss such topics as wealth, value, capital, interest, profits, wages and labor, tariffs, trusts, etc. Debates on current economic problems will be organized in the class. Text-book, library readings, lectures and discussions. Arranged primarily for juniors; open to seniors; 3 hours. Credit, 3. Professor SPRAGUE.

2. **INDUSTRIAL PROBLEMS.** — This is a course in the most important industrial problems of the day, covering the methods of organizations of labor and capital, systems of industrial remuneration, means of securing industrial peace, legal status of labor unions and their activities, protective legislation for workmen and employers, the problems of immigration, the sweated industries, prison labor, child labor and industrial education. Text-book, with collateral readings, lectures and discussions; 3 hours. Credit, 3.

Professor SPRAGUE.

4. **ANTHROPOLOGY; THE HISTORY OF HUMAN CIVILIZATION.** — The evolutionary origin and history of man; characteristics of primitive men, departure from the animal status, and the beginnings of civilization; development of industries, arts and sciences; the growth of languages, warfare, migrations and social institutions; a study of the powerful natural and human forces that have brought man from the early stages to modern conditions; characteristics of the leading races of the world. These topics will constitute the subject-matter of the course. Arranged for sophomores and juniors. Library readings, text-book and lectures; 3 hours. Credit, 3. Professor SPRAGUE.

5. **PUBLIC FINANCE, MONEY AND BANKING.** — This course follows Economics 1. It will take up taxation and the various systems for collecting public revenue in Europe and America, with the problems involved; the history of money and the systems of banking and finance now in operation; the cause and problems of economic crises and depressions; the currency problems of the United States. For juniors and seniors. Readings, lectures and discussions; 3 hours. Credit, 3. Professor SPRAGUE.

7. **SOCIAL INSTITUTIONS AND SOCIAL PROBLEMS.** — This course is devoted to the study of the social institutions, such as the family, the church, State and property; and to such current social problems as divorce, race suicide,

crime and prison reform, poverty and its relief. Considerable time is given to the study of eugenics in its social significance and possibilities. The correctional and charitable institutions of Massachusetts are studied in some detail. The later weeks of the term are devoted to a short introduction to sociological theory. Arranged especially for seniors; open to juniors by permission. Readings, lectures, discussions; 3 hours. Credit, 3.

Professor SPRAGUE.

8. MODERN SOCIAL REFORM MOVEMENTS. — The history of property and its vital issues in modern times; the socialistic systems, anarchy and communism; systems of workingmen's insurance in Europe and America, and other methods of relief from the chances of life; educational reforms, in process, to meet the demands of a new age, and legislative remedies for the evils of social change and maladjustment; the crisis of Christianity under modern capitalized industrialism. These topics indicate the nature of the subjects studied. This course is arranged to follow Economics 7; 3 hours. Credit, 3.

Professor SPRAGUE.

#### HISTORY AND GOVERNMENT.

##### *Elective Courses.*

1. ELEMENTS OF POLITICAL SCIENCE. — Nature and scope of political science; origin and evolution of the State; systems of government in the principal European States; organization and working of the national and of the State governments of the United States; relation of government to political parties and to public opinion; the functions of government as related to labor and commerce. [Withheld in 1914-15.] Three hours. Credit, 3.

2. LOCAL POLITICAL INSTITUTIONS. — A comparative study of the organization, functions and achievements of country and city groups, especially as these are concerned with such matters as taxation, finance, licenses, franchises, public ownership, highways, transportation and communication, water supply, fire protection, public lighting, markets, food inspection, garbage and sewage disposal, infectious diseases, housing conditions, police force, parks and playgrounds, libraries, schools, care of dependents. Three hours. Credit, 3.

3. THE HISTORY OF NEW ENGLAND. — In this course, New England is regarded as a unit. Although the history of agriculture and of rural life is treated with special fulness, ample attention is given to political, religious and ethical history. It is hoped that the student will not only be led to an intelligent understanding of present economic conditions, but will also be imbued with a progressive loyalty to the highest ideals of the New England of the past. Lectures and required reading; 3 hours. Credit, 3. <sup>1</sup>

5. THE HISTORY OF IDEALS. — This course treats history from the idealistic rather than from the economic point of view. It attempts to define

<sup>1</sup> Given in 1914 by Miss Jefferson.

the great ideals which have impelled some of the most important social, political, esthetic, scientific, ethical and religious movements of medieval and modern history, and to trace the causes of the success or failure of the movements to which these ideals have led. Christianity, including monasticism, modern Catholicism and Protestantism; medieval art and architecture; the modern scientific movement; and social and political democracy will be treated historically from this point of view. [Withheld in 1914-15.] Lectures and reading; 3 hours. Credit, 3.

#### LANGUAGES AND LITERATURE.

Professor LEWIS, Associate Professor NEAL, Assistant Professor ASHLEY, Assistant Professor MACKIMMIE, Assistant Professor SMITH, Miss GOESSMANN, Mr. HARMOUNT, Mr. JULIAN, Mr. PRINCE, Mr. RAND.

##### ENGLISH.

##### *Required Courses.*

1, 2. FRESHMAN ENGLISH. — Composition; introduction to literature. Recitations, laboratory practice and lectures; theme writing; conferences. Text-book and laboratory manual, Neal's "Thought-building in Composition." Freshmen; 4 hours. Credit, 4.

Associate Professor NEAL, Assistant Professor SMITH, Mr. PRINCE,  
Mr. RAND.

3, 4. SOPHOMORE ENGLISH. — A general reading course in English literature. Prerequisite, Courses 2 and 3 respectively; sophomores; 2 hours. Credit, 2.

Professor LEWIS and Miss GOESSMANN.

##### *Elective Courses in English Language and Literature.*

[The elective courses in English fall into two groups. Both groups are intended to increase the student's appreciation of literature as a means to enjoyment, education and spiritual growth. Group one (Courses 11, 12, 13 and 14) will, besides introducing the student to individual writers, emphasize the life and thought of the times, political, economic and social, in order that the student may realize literature as the expression of individual genius representing (by leading it or summarizing it) the thought and spirit of a period or a social unit. Group two (Courses 7, 15 and 16) will tend more to emphasize form-characteristics, artistic quality or historical development of literary types, or individual great writers. Courses 7, 12, 13A, 14A, 15A and 16 are offered in 1914-15 and 1916-17; courses 11A, 12, 13B, 14B, 15B and 16 are offered in 1915-16 and 1917-18.]

7. ADVANCED COMPOSITION. — A. *Working Principles of Writing* (fall of 1914, 1916). — A course introducing the student to the more advanced aspects of general composition. It deals with diction, fundamental processes of phrasing, sentence-structure, the gathering of materials and the organization of thought, and the forms of discourse. In treating the forms of discourse, a good deal of attention may be paid to narration (for argumentation, see Debating). The course is recommended to students who wish to increase either their facility in written expression or their appreciation of language as a means of intellectual and artistic expression. For juniors and seniors; every second year; 3 hours. Credit, 3.

Mr. PRINCE.

B. [Withheld.]

8. [Withheld.]



11. ENGLISH WRITERS AND THOUGHT. — A. *From Milton to Pope* (fall of 1915, 1917). — A survey course. It begins with a brief review of the Elizabethan period, and then considers the period of Milton (Caroline literature — Puritanism, the civil wars, Cromwell and the Protectorate), followed by the rapidly changing political and social conditions of the Restoration and then of the Revolution, ending with the Augustan age and Pope, and the temporary predominance of classicism and the intellectual instead of emotional qualities in literature. It will, however, emphasize the leading writers of the periods, including Bacon, Milton, Dryden, Addison and the essayists, Swift and Pope. Much of the literature of these times is closely associated with interesting and most important events in English political, religious and social history that introduce and explain the later modern periods. Juniors and seniors; every second year; 3 hours. Credit, 3.

Assistant Professor SMITH.

B. [Withheld.]

12. AMERICAN WRITERS AND THOUGHT. — Intended to give a general survey of literature in America, especially in the nineteenth century, with an introduction to the work of the best-known writers, and with especial attention to the relations between national life and history and national thought as expressed in literature. The usual authors — Irving, Cooper, Bryant, Poe, Longfellow, Emerson, Hawthorne, Whittier, Parkman, Lowell, Holmes, Whitman, Lanier — will be discussed, and attention will be given to southern and western authors. Present writers and tendencies will also receive some notice. Juniors and seniors; every year; 3 hours. Credit, 3.

Mr. PRINCE.

13. ENGLISH WRITERS AND THOUGHT. — A. *Verse from 1744 to 1832* (fall of 1914, 1916). — A course in history, appreciation and understanding. Between the years named we see the rapid decline in formalism and a rapid increase of originality, freedom and emotional quality in literature (romanticism), accompanying the appearance in England of liberalism, industrial development, more general education and the spread of the ideals of democracy, and influenced also by Continental thought, especially the spirit of the French Revolution. This is the time in which England entered definitely upon that period of modern struggle, change and reorganization which is to be seen still continuing in contemporary affairs. Some of the writers belonging to it are Thomson, Collins, Gray and Cowper, Goldsmith, Chatterton, Blake, Crabbe, Burns, Coleridge, Wordsworth, Keats, Shelley, Scott and Byron. Juniors and seniors; alternates with Course B; 3 hours. Credit, 3.

Assistant Professor SMITH.

B. *Prose from 1744 to 1832* (fall of 1915, 1917). — A course in English prose paralleling Course A, which see. Some of the writers belonging to the period are Johnson, Sterne, Goldsmith, Burke, Miss Burney, Coleridge, Landor, Lamb, De Quincey and Hazlitt. The political essayists and the reviews will receive attention, but prose writers whose principal work was done in the novel will not be emphasized (see Course 15). Juniors and seniors; alternates with Course A; 3 hours. Credit, 3.

Assistant Professor SMITH.

14. ENGLISH WRITERS AND THOUGHT. — A. *Nineteenth Century Verse* (spring of 1915, 1917). — In general conception this course is like Course 13, which see. It begins with literature under the economic and social conditions of Victorian England, involving the advance of democracy, the spread of knowledge and culture, the advance of science, and the increase of industrialism, accompanied somewhat by materialism. The literature of the period takes new forms and directions; among its characteristics is an earnest endeavor to interpret ideals to a vastly increased and incompletely prepared reading public ("social service"). Tennyson, Browning, Mrs. Browning, Arnold, the Rossettis and Morris, Swinburne and Clough are among its noteworthy authors. Contemporary verse-writers will receive some notice. Juniors and seniors; alternates with Course B; 3 hours. Credit, 3.

Professor LEWIS.

B. *Nineteenth Century Prose* (spring of 1916, 1918). — This course parallels Course A, which see. Among the writers discussed will be Macaulay, Carlyle, Ruskin, Newman, historians (*e.g.*, Froude) and essayists (*e.g.*, Pater, Arnold and Symonds). Fiction writers are given little attention (see Course 15), but contemporary writers of other prose will be given some notice. Juniors and seniors; alternates with Course A; 3 hours. Credit, 3.

Professor LEWIS.

15. PROSE FICTION. — A. *The Novel* (fall of 1914, 1916). — The historical development, the technique and the leading types of English novelistic fiction; showing the gradual emergence of specialized forms, the recognition of particular ends that can be served by fiction, and the consequent determination of distinct methods of treatment and classes of material adapted to these ends; and the reading, discussion and criticism of significant works and authors. Among the results that may follow the study of the novel are: (a) a sense of critical method, springing from the consideration of historical development and of types; (b) a deepened humanism, consequent on the study of acts and motives of men and the influences that modify them; (c) increased appreciation of artistic method and form; and (d) acquaintance with a kind of literature that has grown into great importance through the popularizing of science, the downward extension of learning, and the democratizing of society. Juniors and seniors; alternates with Course B; 3 hours. Credit, 3.

Associate Professor NEAL.

B. *The Short Story* (fall of 1915, 1917). — In this course historical development will be more cursorily treated than in Course A, and emphasis will be placed largely upon the characteristics that are primarily of esthetic and cultural effect — structure, artistry, literary quality, finish, emotional quality, dramatic power. Stories may be read, in translation, from other literatures as well as from English, and students will be encouraged to read freely, although critically, of contemporary work. The course is not one in short-story writing, but students interested in this phase of the subject will be assisted as far as possible. General texts, Neal's "Short Stories in the Making" and "To-day's Short Stories Analyzed." Particular results that may be obtained from short-story study are: (a) self-culture, the short story being well adapted to stimulate the literary, dramatic and imaginative faculties;

and (b) acquaintance with that type in which American literature has especially succeeded. Juniors and seniors; alternates with Course A; 3 hours. Credit, 3.  
Associate Professor NEAL.

16. THE DRAMA AND SHAKSPERE. — The source, technique and development of drama, accompanied by a study of Shakspeare, his mind, manner and technique. The minor Elizabethan dramatists, their influence on Shakspeare, and Shakspeare's influence on later writers, will be considered, as will the English social and industrial conditions of the time, their causes and their influence on Shakspeare and his fellow writers. Extensive reading, analysis and interpretation of his comedies, tragedies and histories, and of other works, is included. Juniors and seniors; every year; 3 hours. Credit, 3.

Assistant Professor SMITH.

### JOURNALISM.

[The courses in journalism emphasize rural journalism. They aim to acquaint the student with the elementary problems and theory of journalism as a profession or vocation, and to exercise him, as far as conditions permit, in the commoner aspects of journalistic work, such as news-gathering, news-writing, desk-editing and editorial writing. By rural journalism is meant the application of journalistic principles in getting and suitably presenting material adapted to the non-urban rather than to the urban or metropolitan reader, so far as their interests are distinct. This includes agricultural journalism, but is by no means confined to that. As practical work, members of the classes have for two years supplied "The Bay State Ruralist," a feature page for the "Springfield Sunday Union." Members of all classes may be required to turn in copy regularly for such disposition as the instructor may determine, and must have free time for covering stories.]

#### *Elective Courses.*

1. INTRODUCTION TO JOURNALISM. — The foundation conceptions and aims of journalism; practice in the simple forms of journalistic writing. Prerequisite to all other work in journalism, and valuable also to students preparing for practical farming, agricultural or general science, rural education, etc., as a vocation. Two hours, with a third hour at option of the instructor. Credit, 2.  
Associate Professor NEAL.

2. NEWS-GATHERING AND NEWS-WRITING. — This includes the gathering and presentation of industrial and agricultural information, campus news or other stories, as may be directed. Courses 1 and 2 are the foundation courses in journalism. Students admitted to 2 who have not had 1 may be required to do supplementary work. Two hours, with a third hour at the option of the instructor. Credit, 2.  
Associate Professor NEAL.

3, 4. JOURNALISTIC PRACTICE. — The gathering and preparation of material for publication. Prerequisite, Course 1 or 2. At present this course is given only on application, which should when possible be made early in the first year of study. Two hours, with a third hour at the option of the instructor. Credit, 2.  
Associate Professor NEAL.

5, 6. ADVANCED JOURNALISTIC PRACTICE. — Given only on application. Students may be assigned work as editorial assistants or writers, or otherwise employed in some form of journalistic activity, or directed to the study of particular forms of journalistic writing, of special subjects and their journalistic

presentation, of particular kinds of periodical, or of current topics. The presentation of a thesis may be required. Hours to be arranged. Two hours. Credit, 1. Associate Professor NEAL.

#### PUBLIC SPEAKING.

##### *Required Courses.*

1, 2. FRESHMAN PUBLIC SPEAKING. — Freshman public speaking is required in either the first or the second semester at the option of the instructor. The course is concerned with the actual problems which confront the man who would speak convincingly and persuasively. Some attention is given to breath control and development of speaking voice, considerable attention to pronunciation and enunciation, and a large amount of attention to the preparation and delivery of extempore speeches. Text-book, Shurter's "Extempore Speaking," supplemented by lectures and discussions. Freshmen; in semester 1 or 2 as directed; 1 hour. Credit, 1.

Mr. PRINCE, Mr. RAND.

##### *Elective Courses.*

7. DEBATING. — Considerable time is given to the study of argumentation and brief-drawing. The class is divided into teams for the platform discussion of leading questions of the day. This course is designed to develop readiness in extempore speaking. It is recommended for those who desire to enter the intercollegiate debates. Prerequisite, Course 3; 2 hours. Credit, 2.

Assistant Professor SMITH.

8. OCCASIONAL ORATORY. — Exercises for voice and gesture; a study of the elements of vocal expression and action; speeches on assigned topics; prescribed reading; the preparation and delivery of a formal oration or two. It is especially recommended for those who desire to enter the Flint contest. Two hours. Credit, 2.

Assistant Professor SMITH.

#### FRENCH AND SPANISH.

Assistant Professor MACKIMMIE, Mr. HARMOUNT.

#### FRENCH.

##### *Required Courses.*

1, 2. ELEMENTARY FRENCH. — The essentials of grammar are rapidly taught, and will be followed by as much reading as is possible. This course is required of freshmen presenting German for entrance who do not continue that language and have not studied French; open upon arrangement to other students. Freshmen, 4 hours. Credit, 4.

Mr. HARMOUNT.

3. INTERMEDIATE FRENCH (third year). — Training for rapid reading; the reading of a number of short stories, novels and plays; composition; reports on collateral reading from periodicals and scientific texts in the library. Required of freshmen who present two years of French for entrance and do not take German, and of sophomores who take Courses 1 and 2 as freshmen; open upon arrangement to other students; 4 hours. Credit, 4.

Assistant Professor MACKIMMIE, Mr. HARMOUNT.

4. **INTERMEDIATE FRENCH.** — As stated under Course 3, but not required of sophomores who take Courses 1 and 2 as freshmen. Prerequisite, Course 3.  
Assistant Professor MACKIMMIE.

5. **ADVANCED FRENCH** (fourth year). — A reading course; Balzac's "Eugenie Grandet" and "Le Père Goriot" and other masterpieces of the nineteenth century; Brunetière's "Honoré de Balzac" and Harper's "Masters of French Literature;" readings in the library and written reports. Required of sophomores who take Courses 3 and 4 as freshmen; open upon arrangement to other students. Prerequisite, Course 4; 3 hours. Credit, 3.  
Assistant Professor MACKIMMIE, Mr. HARMOUNT.

*Elective Courses.*

6. **ADVANCED FRENCH** (fourth year). — A general view of the history of French literature; Kastner and Atkins' "History of French Literature." Several plays of the great classical dramatists will be read. Individual conferences on outside reading selected by the student. Prerequisite, Course 5. Sophomores; open upon arrangement to other students; 3 hours. Credit, 3.  
Assistant Professor MACKIMMIE.

7, 8. **SCIENTIFIC FRENCH.** — This course is planned to meet the requirements of the individual student and aims to equip him with exact English equivalents for the French scientific terms in his particular science. Word lists of scientific terms will be required and also weekly readings and reports from scientific works in the subject in which he is majoring. Several scientific readers will be read. Three hours. Credit, 3. Mr. HARMOUNT.

9, 10. **MODERN FRENCH LITERATURE.** — The outline is intended as a suggestion. The exact subject matter of the course will be determined when the men are enrolled. The object of this course is to give an introduction to recent movements in French literature. In the drama, readings from Augier, A. Dumas, fils, Delavigne; in the novel, from Flaubert, the de Goncourts, Zola; in criticism, from Taine, Renan, Sainte-Beuve; for the literary history of the period Lanson's "Histoire de la Littérature Française." Prerequisite, the required French. Juniors or seniors; 3 hours. Credit, 3.  
Assistant Professor MACKIMMIE.

**SPANISH.**

*Elective Courses.*

1, 2. **ELEMENTARY SPANISH.** — Grammar, with special drill in pronunciation; exercises in conversation and composition. Reading from a reader and selected short stories. Intended primarily for juniors. Open to other students upon arrangement. Both semesters; 3 hours. Credit, 3.  
Assistant Professor MACKIMMIE.

3, 4. **MODERN SPANISH AUTHORS.** — Reading from modern Spanish novel and drama. Translation of English into Spanish. Private reading. Prerequisites, Courses 1 and 2. Intended primarily for seniors; 3 hours. Credit, 3.  
Assistant Professor MACKIMMIE.

**GERMAN AND MUSIC.**

Assistant Professor ASHLEY, Mr. JULIAN.

GERMAN.

*Required Courses.*

1. **ELEMENTARY GERMAN.** — Grammar and composition; the reading of short stories, poems, plays, etc. Especial attention is given to oral questioning and answering in German, and to translation of English into German. Required of those presenting French for entrance who do not continue that language and have not studied German. Arranged for freshmen; open by permission to other students; 4 hours. Credit, 4. Mr. JULIAN.

2. **ELEMENTARY GERMAN.** — As stated under Course 1. Prerequisite, Course 1.

3. **INTERMEDIATE GERMAN.** — Rapid reading of selected works from Schiller, Goethe, Lessing and others; review of grammar and dictation in German; outside readings. Required of freshmen who present German for entrance and do not take French. Freshmen; open upon arrangement to other students; 4 hours. Credit, 4. Assistant Professor ASHLEY.

3A. **INTERMEDIATE GERMAN.** — Rapid reading of prose works, such as Sudermann's "Frau Sorge," and dramas, such as "Wilhelm Tell" and "Die Journalisten." Required of sophomores who took Courses 1 and 2 as freshmen. Mr. JULIAN.

4. **INTERMEDIATE GERMAN.** — As stated under Course 3. Prerequisite, Course 3.

4A. **INTERMEDIATE GERMAN.** — As stated under Course 3A. Open to students who have completed German 3A; 3 hours. Credit, 3.

5. **ADVANCED GERMAN.** — Literary study of the classicists, — Schiller's "Wallenstein," Lessing's "Nathan der Weise," Goethe's "Iphigenia," etc.; collateral readings in German and class-room reports. Prerequisite, Course 4. Sophomores; required of those who took German 3 and 4 as freshmen; open upon arrangement to other students; 3 hours. Credit, 3.

Assistant Professor ASHLEY.

*Elective Courses.*

6. **ADVANCED GERMAN.** — As stated under Course 5. Sophomores; open upon arrangement to other students. Prerequisite, Course 5; 3 hours. Credit, 3. Assistant Professor ASHLEY.

7. **SCIENTIFIC GERMAN.** — Reading in German of modern magazine articles and works of a scientific nature. Different work assigned according to needs of individual students. Open to juniors who have completed Course 4A or more advanced work. Three hours. Credit, 3.

Assistant Professor ASHLEY.

8. SCIENTIFIC GERMAN. — As stated under Course 7.

9. CONVERSATION AND COMPOSITION. — Translating connected English into German. Reproducing outside readings in German orally in class; 1 hour. Credit, 1. Assistant Professor ASHLEY.

10. MODERN GERMAN. — As stated under Course 9.

11. GERMAN LITERATURE. — Advanced language and literary study. Conducted entirely in German. Lectures on German literature and history; life, customs and travel in Germany. Collateral readings, including masterpieces of different epochs, such as "Nibelungenlied," Goethe's "Faust," and one modern typical drama. Prerequisite, Course 6 or 10; 3 hours. Credit, 3. Assistant Professor ASHLEY.

12. GERMAN LITERATURE. — As stated under Course 11.

#### MUSIC.

##### *Elective Courses.*

1. HISTORY AND INTERPRETATION OF MUSIC. — History of music among the ancients; medieval and secular music; epoch of vocal counterpoint; development of monophony opera and oratorio; life and works of the greatest representatives of the classical school — Bach, Händel, Haydn, Gluck and Mozart. One hour. Credit, 1. Assistant Professor ASHLEY.

2. HISTORY AND INTERPRETATION OF MUSIC. — A continuation of Course 1. The Romantic school; Beethoven, Schubert, Weber, Mendelssohn, Schumann, Chopin, Berlioz and Liszt; Wagner and the opera. The Modern school and Modern composers. One hour. Credit, 1. Assistant Professor ASHLEY.

**DIVISION OF RURAL SOCIAL SCIENCE.**

President BUTTERFIELD.

**AGRICULTURAL ECONOMICS.**

Associate Professor CANCE, Mr. STRAND.

*Required Course.*

2. **AGRICULTURAL INDUSTRY AND RESOURCES.**— A descriptive course dealing with agriculture as an industry and its relation to physiography, movement of population, supply of labor, commercial development, transportation, public authority and consumers' demand. The principal agricultural resources of the United States will be studied with reference to commercial importance, geographical distribution, present condition and means of increasing the value of the product and cheapening cost of production. Lectures, assigned readings, class topics and discussions. Sophomores; 3 hours. Credit, 3. Associate Professor CANCE and Mr. STRAND.

*Elective Courses.*

3. **ELEMENTS OF AGRICULTURAL ECONOMICS.**— This course is designed to follow the required work in the elements of economics. It deals with the economic principles underlying the welfare and prosperity of the farmer and those institutions upon which his economic success depends; the economic elements in the production and distribution of agricultural wealth; means of exchange; determination of price; problems of land tenure and land values; taxation of farm property; and the maintenance of the economic status of the farmer. Lectures, text, readings, topics and field work; 3 hours. Credit, 3. Associate Professor CANCE.

5. **HISTORICAL AND COMPARATIVE AGRICULTURE.**— Recommended to students in journalism or education. A general survey of agriculture, ancient and modern; feudal and early English husbandry; the later development of English agriculture; the course of agriculture in the United States, with special emphasis on the development of agriculture in New England. An attempt will be made to measure the influence of times, peoples and countries in producing different systems of agriculture, and to ascertain the causes now working to effect agricultural changes. Lectures, readings and library work. Seniors and juniors; open to other students upon arrangement; prerequisite, Course 3 or equivalent; 3 hours. Credit, 3.

Associate Professor CANCE.

6. **CO-OPERATION IN AGRICULTURE.**— The course treats of the history, principles and business relations of agricultural co-operation. (1) A survey of the development, methods and economic results of farmers' organizations and great co-operative movements; (2) the business organization of agriculture abroad, and the present aspects and tendencies in the United States;



(3) the principles underlying successful co-operative endeavor among farmers, and practical working plans for co-operative associations, with particular reference to credit and purchase and the marketing of perishable products. Lectures, text, assigned readings and practical exercises; 3 hours. Credit, 3.  
Associate Professor CANCE.

7. **THE AGRICULTURAL MARKET.** — A study of the forces and conditions which determine the prices of farm products, and the mechanism, methods and problems concerned with transporting, storing and distributing them. Supply and demand, course of prices, transportation by freight, express and trolley, terminal facilities, the middleman system, speculation in agricultural products, protective legislation, the retail market, direct sales and the like are taken up. The characteristics and possibilities of the New England market are given special attention. Lectures, readings, assigned studies and field work. Juniors and seniors; 3 hours. Credit, 3.

Associate Professor CANCE.

8. **PROBLEMS IN AGRICULTURAL ECONOMICS.** — An advanced course for students desirous of studying more intensively some of the economic problems affecting the farmer. Some of these are: land problems, — land tenure, size of farms, causes affecting land values, private property in land, taxation of farm property; special problems, — cost of producing farm products, farm labor in New England, immigration, shifting of the rural population. Opportunity will be given, if practicable, for field work, and students will be encouraged to pursue lines of individual interest. Seniors and juniors; open upon approval to other students; 2 or 3 hours. Credit, 2 or 3.

Associate Professor CANCE.

9. **SEMINAR.** — Research in agricultural economics and history: New England agriculture to 1860. Library work and reports. If desirable some other topic may be substituted. Hours to be arranged. Credit, 1.

Associate Professor CANCE.

10. **SEMINAR.** — As stated in Course 9.

#### AGRICULTURAL EDUCATION.

Professor HART.

##### *Elective Courses.*

1. **RURAL SCHOOL PROBLEMS.** — Primarily for teachers. A study of agricultural education; the theory and practice of teaching; rural school organization; methods of instruction; the place and function of agriculture in the course of study for both rural and city schools; planning and practical work in school and home gardens; planning of equipment and ornamentation of rural school grounds. One lecture period, and 2 2-hour laboratory periods. Credit, 3.

Professor HART.

2. As stated under Course 1.

3. MEANING OF EDUCATION (PSYCHOLOGY).— For teachers and others desiring an introduction to mental science. A study of the development, structure and functions of the nervous system and the sense organs; the development and nature of mental activities; the nature of the learning processes. Three lecture periods. Credit, 3. Professor HART.

4. HISTORY AND PHILOSOPHY OF EDUCATION.— For teachers and others desiring an introduction to educational theories. A study of educational ideals and movements as exemplified by leading nations and races; the growth of educational institutions as influenced by science and industry; the history and meaning of industrial and agricultural education. Three lecture periods. Credit, 3. Professor HART.

5. PROBLEMS IN RURAL EDUCATION.— For teachers or others interested in special phases of education, such as child development, physical and mental; school organization; rural schools; secondary schools; school programs; grading and promotion of pupils; school grounds and school architecture and equipment; normal schools and the preparation of teachers; agricultural teaching and agricultural schools. Two lecture periods. Credit, 2. Professor HART.

6. As stated under Course 5.

7. GRADUATE COURSES.— See Graduate School.

#### RURAL SOCIOLOGY.

President BUTTERFIELD, Professor HART, Miss GOESSMANN, Mr. LUND, Mr. BAIRD.

##### *Elective Courses.*

1. THE RURAL COMMUNITY.— A broad survey of the field of rural sociology, including such topics as the movements of the rural population, the social conditions and life of rural people, the influence of rural life, the description of the various social institutions of the rural community, an analysis of the fundamental problems of rural life, and the means of developing and redirecting the life of the rural community. Lectures, readings and essays on assigned topics; 3 hours. Credit, 3.

President BUTTERFIELD and Mr. LUND.

2. RURAL INSTITUTIONS.— A study of the organized agencies by which rural communities carry on their various forms of associated life; particularly a study of the ways by which the domestic, economic, cultural, religious and political institutions contribute to rural betterment. Special attention given to the rural family and the rural church. Three hours. Credit, 3.

Mr. LUND.

3. THE LITERATURE OF RURAL LIFE.— A critical and appreciative study of writers, both in prose and poetry, who have interpreted nature from the viewpoint of the lover of country life, and those who have idealized agriculture, horticulture and other rural pursuits, together with those who have upheld as an ideal the development of a rural environment in cities. Three hours. Credit, 3. Miss GOESSMANN.

4. RURAL LAW. — The work of this course will cover such points as land titles, public roads, rights incident to ownership of live stock, contracts, commercial paper and distinctions between personal and real property. Text, written exercises, lectures, and class discussions; 1 hour. Credit, 1.

Professor HART.

5. THE STATE AND THE FARMER. — A general survey of political organizations and movements among farmers in foreign countries and their influence in shaping agrarian legislation; the character, extent and results of foreign State aid to the farming class; political movements among farmers in the United States; "Granger" legislation; relation of the Department of Agriculture, State boards of agriculture, agricultural colleges and experiment stations, postal system, railway commissions, highway commissions, public health agencies, etc., to rural welfare. [Not given in 1914-15.] Three hours. Credit, 3.

6. SOCIOLOGICAL ASPECTS OF CO-OPERATION AMONG FARMERS. — An historical sketch of the origin, extent and success of co-operation among farmers in the various European countries and in the United States; personal qualities and social conditions necessary to successful co-operative endeavor; the various forms of co-operative organization viewed in their industrial, intellectual and moral aspects; the influence of co-operation on the farmer's individualism, conservatism, self-help, thrift, contentment and on agrarian legislation, scientific agriculture and farm labor; the relation of co-operation to neighborhood life, to community pride and loyalty, to further associated effort, to class stability, solidarity and status; the demand of co-operation for a new type of leadership; the relation of co-operation to socialism and the competitive system. Three hours. Credit, 3.

8. THE SOCIAL CONDITIONS OF THE RURAL PEOPLE. — <sup>3 E.</sup> Composition of the rural population; nature, extent and causes of diseases and accidents; health agencies of control; extent and causes of delinquency and dependency; conditions of temperance, of sexual morality and family integrity; child labor; woman's work and position; relation of employer to employee; standard of living; size of family; cultural ideals; community consciousness and activity; standards of business conduct and of political ethics. Three hours. Credit, 3.

9. THE SOCIAL PSYCHOLOGY OF RURAL LIFE. — Characteristics of the rural mind; character of hereditary and environmental influences; nature and effects of face-to-face groups; psychological effects of isolation, relative security and freedom from strain; relation of contact with nature, of control over immediate environment, of family co-operation and of neighborhood life to self-control, self-expression, sympathy, service and leadership; nature and effects of fashion, conventionality and custom; character of discussion and public opinion, and their relation to class feeling and organization; relation of individualism, conservatism and homogeneity to crowd phenomena and progressive democracy. Three hours. Credit, 3.

Mr. BAIRD.

10. FARMERS' ORGANIZATIONS. — The history, purposes and achievements of the Grange, the Farmers' Union, farmers' clubs, village improvement associations, boys' clubs, etc.; the nature, scope, methods and history of local, State and national associations formed about some farm product or special farm interest, *e.g.*, dairying, horticulture, stock breeding, forestry; their influence on "better farming, better business, better living;" their influence in forming a class consciousness and in shaping legislation; need of federation. Three hours. Credit, 3. Mr. BAIRD.

11. SOCIOLOGICAL ASPECTS OF CURRENT AGRICULTURAL QUESTIONS. — Government conservation policy, roads, railways, trolleys, telephones, postal service, credit facilities, taxation, pure food laws, tenancy and ownership, intensive versus extensive farming, agricultural labor. Three hours. Credit, 3. Mr. STRAND.

13. SEMINAR.

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## GENERAL DEPARTMENTS.

### MILITARY SCIENCE AND TACTICS.

Captain MARTIN.

[The Department of Military Science and Tactics conducts its work in conjunction with the Department of Physical Education and Hygiene, in accordance with the following statement: —

All candidates for a degree in a four-years course must take for three years three full hours a week of physical training. This work must be under college supervision. At least two years of the work must be taken in the Department of Military Science and Tactics, in accordance with the requirements of the War Department; the rest is to be taken in the Department of Physical Education.

Under this arrangement, the practical (drill) courses in Military Science are given up to the Christmas recess and from the close of the spring recess to the end of the semester each year; the corresponding courses in Physical Education occupy the intervening time.

Under act of Congress (July 2, 1862), military instruction under a regular army officer is required in this college of all able-bodied male students. Men are excused from the exercises of this department only upon presentation of a certificate given by the college physician; minor disabilities which might bar enlistment are not considered. Students excused from military duty may be required to take equivalent work. The object of the instruction is to disseminate military knowledge in order that in emergency trained men may be found to command volunteer troops; but a further object is to give physical exercise, to teach obedience without detracting from self-respect, and to develop the bearing and courtesy that are as becoming in a citizen as in a soldier. Absences and other offences of military nature, and those of which the military instructor may take cognizance as affecting discipline, are dealt with by the commandant in accordance with the regulations of the department; but delinquencies in theoretical instruction not strictly military in their nature are dealt with in accordance with the rules of the faculty.

Cadets in the graduating class who have shown special aptitude for military service are reported to the Adjutant-General of the United States army and to the Adjutant-General of Massachusetts; in making appointments from civil life to the regular or volunteer army, preference is given to those who have been so reported. The names of the three most distinguished are published in the "Official Register of the United States Army." Assignments to the band are made by the military instructor. Practice in the band is credited in place of drill and theoretical instruction.

The required uniform is of khaki, costing about \$18. It is worn by all cadets when on military duty, and may be worn at other times. The uniforms are procured through an authorized tailor. Students upon entering college are required to deposit \$18 with the college treasurer to cover the cost of the uniform. The sale of old uniforms is prohibited, unless the consent of the military instructor be obtained.]

#### *Required Courses.*

1. FRESHMAN DRILL. — Practical instruction in infantry drill regulations through the school of the battalion in close and extended order; advance and rear guards; outposts; marches; ceremonies; guard duty. Upon the conduct and proficiency of this year depends the appointment of corporals for the ensuing year. Freshmen; first semester until Christmas recess; 3 hours. Credit, 1.

Captain MARTIN.

2. FRESHMAN DRILL. — As stated under Course 1. Freshmen; second semester after spring recess; 3 hours. Credit, 1.

3. FRESHMAN TACTICS. — Theoretical instruction in "Infantry Drill Regulations," to include the school of the company, "Manual of Guard Duty," "Small Arms Firing Regulation." Freshmen; 1 hour. Credit, 1.

Captain MARTIN.

4. As stated under Course 3.

5. **SOPHOMORE DRILL.** — Practical instruction as before; pointing, aiming and sighting drills; litter drills, and first aid to the injured by detachment; target practice, in gallery and on the range. Corporals are appointed from this class. On their conduct and proficiency depends their appointment as sergeants in the next class. Sophomores; first semester until Christmas recess; 3 hours. Credit, 1.  
Captain MARTIN.

6. As stated under Course 5; second semester after spring recess.

7. **SOPHOMORE TACTICS.** — Theoretical instruction in "Infantry Drill Regulations," to include the school of the battalion; advance and rear guards; outposts; marches and ceremonies; "Manual of Field Service Regulations;" preparation of reports; returns, muster-rolls, enlistment and discharge papers, rosters and requisitions, etc.; "Army Regulations;" lectures on military science. Sophomores; 1 hour. Credit, 1.  
Captain MARTIN.

8. As stated under Course 7.

9. **JUNIOR DRILL.** — Practical instruction as before, target practice, in gallery and on the range. Sergeants are appointed from this class. On their conduct and proficiency depends their selection as officers for the ensuing year. When necessary, officers will also be appointed from this class. Juniors; first semester until Christmas recess; 3 hours. Credit, 1.  
Captain MARTIN.

10. **JUNIOR DRILL.** — As stated under Course 7; second semester after spring recess.

#### *Elective Courses.*

11. **SENIOR DRILL.** — Practical instruction as before; conduct of drills of lower classes. Officers will as a rule be selected from this class. Cadets electing Courses 11 and 12 must take the election for the year, and not later than the first Monday in June of their junior year. No cadet electing this course will after the commencement drill be permitted to change his election without the consent of the dean of the faculty and of the commandant. Seniors; first semester until Christmas recess; 3 hours. Credit, 1.  
Captain MARTIN.

12. **SENIOR DRILL.** — As stated under Course 11; second semester after spring recess.

### **PHYSICAL EDUCATION AND HYGIENE.**

Assistant Professor HICKS, Mr. GORE, Mr. FITZMAURICE.

#### **HYGIENE.**

##### *Required Course.*

1. **HYGIENE.** — Lectures, reading, quizzes and a report on some assigned topic of personal hygiene or sanitation. Freshmen; 1 hour. Credit, 1.

Assistant Professor HICKS.

## PHYSICAL EDUCATION.

[The Department of Physical Education conducts its work in physical training in conjunction with the Department of Military Science and Tactics, as explained in the note preceding the description of the courses in Military Science. All classified undergraduate students are given a physical examination upon entering.]

*Required Courses.*

1. ELEMENTARY GYMNASTICS. — Exercises, games and athletics; from January 1 to April 1, in connection with Course 2. Freshmen; 3 hours. Credit (given only for Course 2), 1. Mr. GORE and Mr. FITZMAURICE.

2. ELEMENTARY GYMNASTICS. — As stated under Course 1.

3. GRADED GYMNASTICS. — Exercises, games and athletics; from January 1 to April 1, in connection with Course 4. Sophomores; 3 hours. Credit (given only for Course 4), 1. Mr. GORE and Mr. FITZMAURICE.

4. GRADED GYMNASTICS. — As stated under Course 3.

5. GYMNASTICS. — Drills, games and athletics; from January 1 to April 1, in connection with Course 6. Juniors; 3 hours. Credit (given only for Course 6), 1. Mr. GORE and Mr. FITZMAURICE.

6. GYMNASTICS. — As stated under Course 5.

*Elective Courses.*

7. TRAINING COURSE. — History of Physical Education; supervision of indoor and outdoor athletic contests and games; athletic administration. Seniors; 3 hours. Credit, 1. Assistant Professor HICKS

8. TRAINING COURSE. — As stated under Course 7.





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THE GRADUATE SCHOOL.

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# THE GRADUATE SCHOOL.

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KENYON L. BUTTERFIELD, A.M., LL.D., President of the College.

CHARLES E. MARSHALL, Ph.D., Director of the Graduate School and Professor of Microbiology.

Graduate Staff, 1914-15: DR. ANDERSON, DR. CANCE, DR. CHAMBERLAIN, DR. FERNALD, Professor FOORD, Professor GRAHAM, Professor HART, Professor HASKELL, DR. LINDSEY, DR. MARSHALL, Professor McLEAN, Professor NEHRING, Professor OSMUN, DR. PAIGE, DR. PETERS, Professor SEARS, DR. SHAW, DR. VAN SUCHTELEN, Professor WAUGH and President BUTTERFIELD.

Graduate courses leading to the degrees of master of science and doctor of philosophy have been given for a number of years. Demands for these courses have now greatly increased, and in recognition of the benefits to be derived from a separate organization, a distinct graduate school has been established for the purpose of fitting graduates of this and other institutions for teaching in colleges, high schools and other public schools; for positions as government, State and experiment-station agriculturists, bacteriologists, botanists, chemists, entomologists, horticulturists and zoölogists; and for numerous other positions requiring a great degree of skill and scientific knowledge.

## ADMISSION.

Admission to the graduate school will be granted:—

1. To graduates of the Massachusetts Agricultural College.
2. To graduates of other institutions of good standing who have received a bachelor's degree substantially equivalent to that conferred by this college.

In case an applicant presents his diploma from an institution of good standing, but has not, as an undergraduate, taken as much of the subject he selects for his major as is required of undergraduates at the Massachusetts Agricultural College, he will be required to make up such parts of the undergraduate work in that subject as the professor in charge may consider necessary. He shall do this without credit toward his advanced degree.

Admission to the graduate school does not necessarily admit to candidacy for an advanced degree, — students holding a bachelor's degree being in some cases permitted to take graduate work without becoming candidates for higher degrees.

Applications for membership to the graduate school should be presented to the director of the school. Full statements of the applicant's previous training, of the graduate work desired, and of the amount and kind of work already done by him as an undergraduate should be submitted, — together with a statement whether the applicant desires to work for a degree.

Registration is required of all students taking graduate courses, the first registration being permitted only after the student has received an authorization card from the director.

## NATURE AND METHODS OF GRADUATE WORK.

Persons taking graduate work will find this quite different in its nature from undergraduate courses. A broad knowledge of two (or three) subjects is required, and the professors in charge of these may adopt any methods which may seem desirable to secure this to the student. Lectures, laboratory and field work in various forms are utilized; but whatever the method chosen, the aim is to train the students in methods of original investigation and experiment, inductive reasoning and the ability to carry on independent research. In addition to the lectures, a large amount of outside reading is required, the object being to give a broad knowledge of all aspects of the subjects chosen, in addition to the complete knowledge of those portions involved in or directly related to the original investigation which is to result in the thesis. Originality and ability to lead in scientific research after completing graduate work, and the establishment of a broad and thorough foundation upon which these qualities must be based, are the objects aimed at; and any methods which promise to give these results may be made use of (varying according to the nature and personal equation of each student), the supervision being largely individual rather than collective.

Candidates for the degree of master of science are required to prosecute two subjects, one of which shall be designated as the major and the other as the minor. These subjects may not be selected in the same department.

Candidates for the degree of doctor of philosophy are required to prosecute three subjects, one of which shall be designated as the major, the others as minors. No two of these subjects may be taken in the same department.

Candidates for the degree of master of agriculture are allowed greater privileges in the selection of subjects, but will be required to select a major and such other supporting lines of study as will be necessary to properly equip the individual professionally.

Advanced students who are not candidates for degrees may, with the approval of the faculty of the school, take more than one subject in the same department.

A statement of the subjects chosen must in each case be submitted to the director of the school for approval by the necessary committee. The chosen subjects must bear an appropriate relation to each other.

A working knowledge of French and German is essential to successful graduate work, and students not having this will find it necessary to acquire it as soon as possible after entering.

The graduate staff reserves the privilege of recommending and allowing courses in other institutions as a part of residence instruction. Such supervision will be exercised by the graduate staff and credit granted as are essential to the highest standards of efficiency.

A description of the equipment of the various departments is given under "General Information."

## THESES.

A thesis is required of each candidate for an advanced degree. It must be on a topic belonging to the candidate's major subject, must show that its writer possesses the ability to carry on original research, and must be an actual contribution to knowledge.

Two copies of each thesis in its final form, ready for the printer, must be submitted to the director of the school before the candidate for the degree may take the required oral examination. One of the said copies, to contain all drawings, is to be retained as an official copy by the said director, and the other by the department in which the thesis was prepared. The candidate for the doctor's degree must be prepared to defend at the oral examination the views presented in his thesis. When printed, three copies of each thesis must be deposited with the director of the graduate school and three copies with the department in which the work was carried out.

All theses become the property of the department in which they are prepared.

#### FINAL EXAMINATIONS.

For the degree of master of science or master of agriculture, a final examination, which may be either written or oral, or both, is given upon the completion of each subject.

For the degrees of doctor of philosophy or doctor of agriculture, final examinations on the minors taken are given upon the completion of the subjects. In the major subject, a written examination, if successfully passed, is followed by an oral examination in the presence of the faculty of the school.

#### DEGREES CONFERRED.

The degree of master of science and master of agriculture are conferred upon graduate students who have met the following requirements:—

1. The devotion of at least one year and a half<sup>1</sup> to the prosecution of study in two subjects of study and research, not less than one full college year of which must be in residence.

2. The devotion of twenty hours<sup>1</sup> each week to the chief or major subject, and of from twelve to sixteen hours per week to the minor subject.

3. The preparation of a thesis in the major subject, constituting an actual contribution to knowledge, and accompanied by drawings if necessary. The thesis may be waived for the degree of master of agriculture.

4. The passing of final examinations, in both major and minor subjects, to the satisfaction of the professors in charge.

5. The payment of all fees and college expenses required.

The degrees of doctor of philosophy and doctor of agriculture are conferred upon graduate students who have met the following requirements:—

1. The devotion of at least three years to the prosecution of three subjects of study and research in residence at the college.

2. The devotion of twenty hours<sup>1</sup> each week to the chief or major subject during the entire period, and of from twelve to sixteen hours per week for a year and a half to each minor subject.

3. The preparation of a thesis, in the major subject, constituting an actual contribution to knowledge and accompanied by drawings if necessary. For the degree of doctor of agriculture the thesis may be modified to meet professional requirements.

4. The passing of final examinations, in both the major and minor subjects, to the satisfaction of the professors in charge.

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<sup>1</sup> All time statements refer to minimum time.

5. The payment of all fees and college expenses required.

The fee for the degree of master of science is \$10, and for the degree of doctor of philosophy, \$25.

#### COURSES OFFERED.

Courses available as major subjects for the degree of doctor of philosophy: —

Botany.	Horticulture.
Chemistry.	Microbiology.
Entomology.	

Courses available as major subjects for the degree of master of science: —

Agriculture.	Landscape gardening.
Agricultural economics.	Mathematics and physics.
Agricultural education.	Microbiology.
Botany.	Poultry science.
Chemistry.	Rural sociology.
Entomology.	Veterinary science.
Horticulture.	

Course available as major subject for the degree of master of agriculture: —

Poultry science.

Courses available as minor subjects for the degree of doctor of philosophy: —

Agriculture.	Horticulture.
Agricultural economics.	Landscape gardening.
Agricultural education.	Microbiology.
Animal pathology.	Poultry science.
Botany.	Rural sociology.
Chemistry.	Zoölogy.
Entomology.	

Courses available as minor subjects for the degree of master of science: —

Agriculture.	Landscape gardening.
Agricultural economics.	Microbiology.
Agricultural education.	Mathematics and physics.
Animal pathology.	Poultry science.
Botany.	Rural sociology.
Chemistry.	Veterinary science.
Entomology.	Zoölogy.
Horticulture.	

#### GENERAL OUTLINE OF COURSES FOR ADVANCED DEGREES.

AGRICULTURAL ECONOMICS (Major Course). — 1. Graduate research work in agricultural economics will be developed by four principal methods, namely, historical, statistical, accounting and general field investigation. In all instances the method includes facility in investigation, tabulation and interpretation of results.

2. Candidates for the master's degree, or candidates offering a minor in agricultural economics, will be required to pass an examination covering the undergraduate work now offered in agricultural economics, including Course 3, the elements of economics, Course 7, the agricultural market, and

Course 6, co-operation in agriculture; and in addition such definite research work as may be outlined by the department, to consist of original investigations in some particular divisions of the subject of agricultural economics. Courses 6, 7 and 8 are for graduates and undergraduates. Special investigations may be made by electing seminars in agricultural economics.

3. Candidates for the master's degree will be required to write a thesis or a report covering results of a specific line of personal investigation in one or more fields of the subject. Each candidate will also be required to have a working knowledge of the general field of economics, the theory of agricultural economics, the problems of agricultural production, land tenure, land problems, agricultural commerce, agricultural co-operation, statistics of agriculture and prices, and markets and marketing.

AGRICULTURAL EDUCATION (Major Course). — Courses are available in agricultural education as major or minor subjects for the degree of master of science, or, as a minor subject, for the degree of doctor of philosophy. Study will be pursued along one or several of the following lines:—

1. Massachusetts school legislation.
2. Origin and growth of primary, secondary and higher education in Massachusetts.
3. The origin and growth of normal schools, industrial schools and agricultural schools.
4. Educational literature, fiction, periodicals and reports.
5. The physical and mental development of the individual.
6. School administration.

ANIMAL PATHOLOGY (Minor Course only). — 1. Reviews in anatomy.

2. Reviews in organography and histology.

3. Special lectures and readings in general and special pathology.

4. Laboratory studies in general and special pathology.

5. Pathological technique.

6. Conferences.

BOTANY (Major Course). — The following subjects in botany may be studied:—

(a) Plant physiology.

(b) Plant pathology.

(c) Ecology.

(d) History of botany.

In the graduate course in botany special attention is given to such subjects as plant physiology and pathology, ecology and the history of botany, etc. These subjects are pursued to a greater or less extent, as the previous training of the student and the nature of the original problem undertaken may determine. The object of the course is to give the student a technical training in botany to develop the spirit of research and to lay a broad foundation in the subject. (As a supplement to this course the student will do well to take, in addition to his prescribed minor work, a brief course in the history of philosophy and psychology.) Extensive reading of botanical literature, both general and specific, is required in certain subjects, and weekly lectures are given, together with occasional seminars, in which various new problems of botanical science are considered. A thesis dealing with some economic problem in plant physiology or pathology, or in both, and containing a distinct contribution to knowledge, is required.

CHEMISTRY (Major Course). — The department is prepared to offer advanced courses in the following branches of chemistry, particularly as applied to agriculture: —

- (a) Inorganic chemistry.
- (b) Organic chemistry.
- (c) Physiological chemistry.
- (d) Physical chemistry.
- (e) Analytical chemistry.

Here follows a statement of courses which may be selected by any one properly qualified, and particularly by those who are desirous of doing work for advanced degrees: —

*Course A.* — Research in industrial problems applied to agriculture.

Associate Professor PETERS.

*Course B.* — Research in physico-agricultural chemistry. Prerequisite, Course 15 or its equivalent.

Associate Professor ANDERSON.

*Course C.* — Advanced analytical chemistry. Research work in connection with the study of methods of analysis of fertilizers, cattle feeds, dairy products, soils, insecticides and sugars. Recent and original methods will be applied to a study of the composition of agricultural products.

Professor WELLINGTON or Associate Professor PETERS.

*Course D.* — Advanced organic chemistry. Special topics in advanced organic chemistry will be considered, both by lectures and in the laboratory. These will include such subjects as constitution and properties of carbohydrates, proteins and fats, uric acid and related compounds, and alkaloids; also such purely chemical phenomena as isomerism, tautomerism and optical rotation. The reading will include "The Monographs on Biochemistry," Cohen, Schorlemmer and Lachman.

Professor CHAMBERLAIN.

*Course E.* — Advanced topics in physiological agricultural chemistry will be studied especially in the laboratory, including digestion, metabolism and nutrition, dietetics, feeding rations, enzymatic action and isolation of enzymes. Required reading will be followed in Abderhalden, Lusk, Hammersten, Stiles, Armsby and Euhler.

Professor CHAMBERLAIN.

*Lectures on Special Topics.* — In addition to the research laboratory courses outlined above, lectures on special topics in organic, analytical and physical chemistry will be given by Professors Chamberlain, Peters and Anderson. These will at present be given in alternate years only. Required of all students majoring in chemistry.

Students for the advanced degrees of master of science and doctor of philosophy, who are taking chemistry as a major, must present as prerequisites all undergraduate courses, 1 to 15 or their equivalent. They will be given a special outline of work, and will also be assigned a subject for an original thesis by the professor in charge. At the end of the work there will be a final written and oral examination before the department. All of this must be completed to the satisfaction of the chemical staff, and particularly of the professor



under whom the work is done. Students not working for a degree may take special work along agricultural chemical lines. Information may be obtained by consulting the chemical staff.

ENTOMOLOGY (Major Course). — I. For the degree of doctor of philosophy as a major: Some knowledge of all the divisions of this subject is essential for the professional entomologist, though a large part of his time will be devoted only to certain portions. To insure some familiarity with all these divisions, lectures, laboratory work, field training or required reading are given in each of the following topics: —

(a) *Morphology*. — Embryology and polyembryony; transformations; histology; phylogeny; hermaphroditism; hybrids; parthenogenesis; pedogenesis; heterogamy; chemistry of colors; coloration; luminosity; deformities; variation.

(b) *Ecology*. — Dimorphism; polymorphism; protective devices; mimicry; psychoses; insect architecture; plant fertilization; insect products; geographical distribution; methods of distribution; migration; geological history; insects and disease; enemies of insects, vegetable and animal; duration of life; experimental entomology.

(c) *Economic Entomology*. — Special methods of control; insecticides; special research; insect photography; methods of preparing illustrations; field work and life-history investigations; insect legislation; methods of record keeping.

(d) *Systematic Entomology*. — History of entomology; classifications and the principles of classification; nomenclature and its rules; how to find and use literature; preparing indices; number of insects known and in existence; lives of prominent entomologists; methods of collecting, preparing, preserving and shipping; important collections; location of types.

(e) *Seminar*. — A monthly meeting of graduates, at which reports on current literature are presented and various entomological topics of importance are discussed.

(f) *Required Readings*. — The best articles on topics named above and on the different orders of insects, in English, French or German, the candidate to be examined at the close of his course on this with his other work.

(g) *Thesis*. — A thesis, illustrated with drawings, consisting of the results of original investigation upon one or several topics, and constituting a distinct contribution to knowledge, must be completed before the final examinations are taken.

II. For the degree of doctor of philosophy as a minor, and for the degree of master of science either as a major or minor: Such portions of the course outlined above as seem most appropriate to their other subjects are given to students taking entomology as a minor.

HORTICULTURE. — Graduate work is offered in various lines of horticulture. For the most part this is divided into the different departments which now constitute the college Division of Horticulture, and which are as follows: pomology, floriculture, landscape gardening, forestry and market gardening. For work in these lines application should be made direct to the heads of the several departments.

Besides this work, however, opportunity is offered for graduate study in general horticulture, including topics from the several organized departments mentioned, and also questions relating to plant breeding, general evolution, propagation, manufacture of horticultural products, etc. This

general work is under the direction of Prof. F. A. Waugh, head of the Division of Horticulture.

**LANDSCAPE GARDENING (Major Course).** — Every student before receiving his master's degree with a major in landscape gardening must have given some thorough and fruitful study to each of the following five departments. As far as possible these studies must be of a practical nature, *i.e.*, they must be made upon actual projects in progress of development.

1. *Theory.* — The principles of esthetics as applied to landscape gardening.
2. *Design.* — The principles of pure design and their application in landscape and garden planning.
3. *Construction.* — The practical methods of carrying out landscape plans, laying out, equipment, organization of working force, time and cost keeping, etc.
4. *Maintenance.* — Methods, organization, cost.
5. *Practice.* — Office work, drafting, estimating, reporting, charges, accounting.

*Qualifications.* — Each student before he may receive the master's degree with a major in this department must convince his instructors that he has a genuine aptitude for some branch of landscape gardening, either in design, construction or management.

*Thesis or Project.* — Each student, before receiving the master's degree with a major in landscape gardening, must present a satisfactory thesis or complete project. A thesis will consist of a careful original study of some problem in landscape gardening, presented in typewritten form with any necessary illustrations, such as photographs, diagrams, drawings, etc. A project will consist of a completed set of studies of some suitable landscape-gardening problem, such as the design of a park, a real estate subdivision, an extensive playground. Such a project will usually consist of: —

- (a) Original surveys, including topography.
- (b) Block plans, showing original design.
- (c) A rendered plan or plans of the main features.
- (d) Detailed working drawings.
- (e) Estimates of cost.
- (f) Complete report and letter of transmittal.

**Minor Course.** — Any student electing a minor in landscape gardening will be directed to take such courses from the regular catalogue list as may seem most suitable for him. Under ordinary circumstances no other work will be given to students electing minors. In special cases, however, individual problems will be assigned and individual instruction given. These exceptions will be made in cases where, by so doing, it is possible to give the student material assistance in the plan of his major work.

**MICROBIOLOGY (Major Course).** — 1. *Reading.* — Readings will be assigned and reports with critical analyses of literature covering the general subject will be required. For this purpose such material will be selected as will be most pertinent to the needs of the student. Lectures will be given from time to time.

2. *Seminar.* — At intervals the immediate laboratory work and studies of the student will be surveyed and the literature bearing thereon will be discussed. The shaping of investigations in accordance with the critical analyses of the specific literature of the problem involved will be the important rôle of the seminar.

3. *Morphological and Cultural Studies.* — Special advanced studies in the cytology, morphology and cultural characters of micro-organisms will be the general theme of this course. The important factors in classifying and grouping organisms call for an intimate knowledge of this particular phase of microbiology. Laboratory technic will receive emphasis.

4. *Physiological Studies.* — The changes produced by micro-organisms and their functionings in general open a very broad field for investigation and systematic study. It is advised that every graduate student in microbiology give much attention to this branch, gaining thereby the greatest comprehensive knowledge of physiological processes, as well as the methods employed in their determinations.

5. Special advanced courses will be offered in those phases of microbiology indicated by the undergraduate courses: —

1. Fermentation microbiology.
2. Soil microbiology.
3. Dairy microbiology.
4. Food microbiology.
5. Hygienic and sanitary microbiology.

It will be assumed that all graduate students of microbiology must be acquainted with the details of all important phases of agricultural microbiology.

Minor Course. — 1. Courses constituting undergraduate major in microbiology, or their equivalent, will be required.

NOTE. — If the student is familiar with the work of these courses, advanced work will be given in accordance with the graduate major outline.

2. Emphasis will be placed upon that particular phase of microbiology which will be particularly pertinent to the student's major course.

3. Readings will be assigned, and will be reviewed in conferences.

4. Special lectures on selected subjects in microbiology will be given from time to time.

POULTRY SCIENCE (Major Course for the Degrees of M.S.<sup>1</sup> and M.Agr.) —

1. *Reading.* — This course consists of a review of the entire field of poultry literature, covering books, bulletins and special articles. A working index will be required of each student.

2. *Seminar.* — This course consists of a criticism of the most important experiments carried on at the various stations in this and other countries; also a study of poultry conditions in foreign countries, methods of management, etc.; a more detailed study of some of the largest poultry projects in this country.

3. *Anatomy (Gross and Histological), Physiology, Embryology, Pathology and Surgery.* — This course consists of a careful study of the anatomy and physiology of the fowl; also the development of the chick in the shell, not only as an embryological study, but in relation to metabolic processes and heredity. Surgery includes the removal of warts, tumors and similar growths; operating on birds that are crop bound, or have bumble foot or broken legs; also a removal of sexual organs and regrafting the same.

4. *Breeding.* — Longevity, broodiness, size, shape, color of egg, body characteristics, vigor, egg production, etc., are all characters whose relations to heredity are not understood. Breeding projects along these lines are

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<sup>1</sup> Original investigations are required of students working for this degree.

a part of this course. The student will also do considerable work in connection with our regular experimental projects.

5. *Feeding.* — This course consists of feeding for color of yolk, feathers, shell, size of egg and chemical variations due to the various feeds; also to determine the relative value of various foods for various purposes.

6. *Brooding.* — This course consists of original work to determine the relation between viability and rate of growth and the following: type of brooder, number of chicks in brood, sanitation, exercise and weather conditions; also a comparison of hen-hatched chicks with those hatched artificially.

7. *Incubation.* — This course includes a study of a large number of perplexing problems of a practical, scientific and mechanical value.

8. *Poultry Diseases.* — This course includes a study of a number of the most important poultry diseases in relation to the rapidity with which they spread and their eradication; also various problems in poultry sanitation.

9. *Thesis.* — This may be either of a scientific or practical nature, or both, and subjects may be chosen from any one of the above courses, except the first and second. (Required of students working for degree of M.S.)

NOTE. — 1. The postgraduate course includes all undergraduate work, together with practical experience. Without the latter, students will be unable to handle Courses 4, 5 and 6.

2. Practical poultry work will be required without credit.

3. Courses 1 and 2 are designed particularly for minors.

RURAL SOCIOLOGY (Major Course). — The scope and character of the work for the degree of master of science in this department are as follows: —

1. All courses included in the department of rural sociology. They are as follows: —

The Rural Community, Rural Sociology 1.

The Literature of Rural Life, Rural Sociology 3.

Rural Law, Rural Sociology 4.

The Social Conditions of the Rural People, Rural Sociology 8.

Sociological Aspects of Co-operation among Farmers, Rural Sociology 6.

Rural Institutions, Rural Sociology 2.

The State and the Farmer, Rural Sociology 5.

The Social Psychology of Rural Life, Rural Sociology 9.

Farmers' Organizations, Rural Sociology 10.

Sociological Aspects of Current Agricultural Questions, Rural Sociology 11.

2. Special study of the three following groups of subjects as related to rural conditions: —

(a) Nature, extent and causes of diseases and accidents; health agencies of control; extent and causes of delinquency, and of dependency and the various agencies of amelioration; child labor; woman's work and position; character and status of farm labor.

(b) Standards of living; cultural agencies and ideals; moral relations.

(c) Community consciousness and social activities; the character of discussion and of public opinion, and the relation of these to class feeling and organization.

3. Selected group of subjects in the following field: —

Some participation in the organization and direction of rural forces. This practical work will be under the direction of the department and in connection with such organizations as rural churches, the United States Department of Agriculture, and the Extension Service of the college.

The student whose minor is in rural sociology will have his work selected largely with reference to his previous preparation and his major subjects.

**VETERINARY SCIENCE.** — Work is available in anatomy, hygiene, veterinary pathology, medicine, surgery, parasitology and other special lines or divisions of the subject.

**ZOÖLOGY.** — Courses in zoölogy are available as a minor for the degree of master of science, and as a minor for the degree of doctor of philosophy. The nature of the work varies according to circumstances, and may be intensive in a special field, or of a somewhat more general character, depending on the student's previous acquaintance with general zoölogical science.

The time devoted to zoölogy as a minor for either of the above-named degrees may vary from twelve to sixteen hours per week, pursued for a year and a half.

#### LIST OF STUDENTS.

A list of the degrees conferred in the Graduate School, and of the students enrolled, is given in the general lists at the end of the volume.



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THE SHORT COURSES  
AND  
THE EXTENSION SERVICE.

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# THE SHORT COURSES AND THE EXTENSION SERVICE.

## SHORT COURSES.

The short courses offered by the Massachusetts Agricultural College are designed to meet the needs of those who cannot come to the college for the regular academic courses. They furnish the student with instruction in modern, accepted methods, and are made as concentrated and as practical as possible. In the main, the instruction is given by the regular teaching force of the college, the same laboratories and equipment being used as in the regular college work.

The short courses may be grouped as follows: —

- A. Winter Schools.
  - 1. Ten Weeks' Course.
  - 2. Farmers' Week.
  - 3. Apple Packing School.
  - 4. School for Tree Wardens.
  - 5. Beekeepers' Course and Convention.
- B. Summer Schools.
  - 1. Summer School of Agriculture and Country Life.
  - 2. School for Rural Social Service.
  - 3. Conference on Rural Community Planning.
  - 4. Boys' Agricultural Camps.
  - 5. Poultry Convention.
- C. Miscellaneous Short Courses.
  - 1. Short Courses for Special Groups (feed dealers, town officials, etc.).
  - 2. Special Days for Foreigners.
  - 3. Meetings of Organizations at the College.

EXPENSES OF THE SHORT COURSES. — The expense of attending any of the Short Courses is approximately as follows: —

Registration fee (Ten Weeks' Course, Apple Packing School, Summer School),	\$5
Furnished rooms in private houses (per week),	\$1.50-\$3
Board at college dining hall, per week,	\$4
Board with private families, per week,	\$5-\$6

A lunch counter is operated in connection with the college dining hall. Meals may be obtained there *à la carte* at very reasonable prices.

Students in each of the dairy courses must provide themselves with two white wash suits and a white cap for use in the practical dairy work. The cost in Amherst is about \$1.25 for suit and cap.

REQUIREMENTS FOR ADMISSION TO SHORT COURSES. — No entrance examinations are required, but students are advised to review their school work in English and arithmetic. Practical experience in farm, garden, orchard or greenhouse work is an advantage. The courses are open to both men and women.

Students must be at least eighteen years of age and must furnish satisfactory evidence of good moral character. References are required, and these are investigated before applicants are accepted.

#### A. WINTER SCHOOLS, 1915.

1. OUTLINE OF THE TEN WEEKS' COURSES (JANUARY 5 TO MARCH 12, INCLUSIVE). — The following courses are to be given:—

1. Soil Fertility. Associate Professor HASKELL. Three lectures a week.
2. Field Crops. Assistant Professor McDONALD. Two lectures and one two-hour laboratory period a week.
3. Types and Breeds of Live Stock. Instructor to be announced. Three lectures and two two-hour judging periods a week.
4. Live Stock Feeding. Instructor to be announced. Three lectures a week.
5. Live-stock Management. Assistant Professor QUALIFE. One two-hour laboratory period a week.
6. Animal Breeding. Associate Professor McLEAN. One lecture and one two-hour laboratory period a week.
7. Dairying. Professor LOCKWOOD, Mr. COONS, and Assistants. Five lectures and two two-hour and two three-hour laboratory periods a week.
8. Dairy Bacteriology. Professor MARSHALL. Two lectures a week.
9. Animal Diseases and Stable Sanitation. Professor PAIGE. Two lectures a week.
10. Poultry. Professor GRAHAM and Mr. PAYNE. Five lectures and one two-hour laboratory period a week.
11. Farm Management and Farm Accounts. Professor FOORD. One lecture and one two-hour laboratory period a week.
12. Fruit Growing. Professor SEARS. Three lectures and two two-hour laboratory periods a week.
13. Market Gardening. Mr. TOMPSON.<sup>1</sup> Three lectures and two two-hour laboratory periods a week.
14. Landscape Gardening. Assistant Professor HARRISON. Two two-hour laboratory periods a week.
15. Floriculture. Associate Professor NEHRLING and Mr. THURSTON. Five lectures and one field trip a week.
16. Forestry. Professor CLARK. One lecture a week.
17. Botany. Mr. McLAUGHLIN. Two lectures a week.
18. Entomology. Professor FERNALD. Three lectures a week.
19. New England Rural Life. One lecture a week.
20. Mechanics. Associate Professor GUNNESS. One two-hour laboratory period a week.
21. Rural Sanitary Science. Professor MARSHALL. Two lectures a week.
22. Beekeeping. Associate Professor GATES and Mr. BYARD. Two lectures and one laboratory period a week.
23. Rural Improvement. Professor WAUGH. Two lectures a week.
24. Marketing and Agricultural Economics. Associate Professor CANCE. Three lectures a week.

2. FARMERS' WEEK. — In order to reach those who cannot come to the college for a longer time this very practical course, four days in length, is given each year. The regular college equipment is used, and work of the regular faculty is supplemented by lectures and demonstrations by eminent men.

The work is divided into six sections as follows:—

1. Field Crops and Farm Management.
2. Animal Husbandry and Dairying.
3. Poultry Husbandry.
4. Fruit Growing, Market Gardening, Floriculture, Forestry.
5. Women's Section, Home Economics.
6. Community Organization.

<sup>1</sup> Temporary head of the Department of Market Gardening.

These sections take up the time from early morning until late afternoon. Prominent men are engaged for the evening lectures. Fruit, corn, livestock, dairy and poultry shows, and other exhibits, are among the leading features. No fee is charged. The 1915 Farmers' Week is March 15 to March 19, inclusive.

3. **APPLE PACKING SCHOOL.** — The work of this school, which is conducted by the department of pomology, is of a practical nature, and includes both box and barrel packing. Persons taking the course will become familiar with the various types of packs, and will receive sufficient practice to enable them to do good commercial packing.

4. **SCHOOL FOR TREE WARDENS.** — This course is given in co-operation with the State Forester and the Massachusetts Forestry Association, to give tree wardens and city foresters instruction in the planting, care and preservation of trees, forestry practices, spraying, pruning, duties of tree wardens and various phases of civic improvement. The 1915 school will be held March 23 to 26, inclusive. No registration fees are charged.

5. **BEEKEEPERS' COURSE.** — In the last few years a complete apiary and equipment has been brought together at the college, under the direction and management of Dr. Burton N. Gates. This equipment furnishes the best of facilities for the teaching of beekeeping and allied subjects. A conference of beekeepers, with extensive exhibits of beekeepers' supplies and apparatus, is held annually at the close of each short course.

The courses offered are: —

1. Practical Phases of Beekeeping. Associate Professor GATES.
2. Crops for Honey Bees. Dr. BROOKS.
3. Relation of Bees to the Pollination of Plants. Associate Professor OSMUN.
4. Bees and Beekeepers' Supplies. Professor PAIGE.

The features of the convention are lectures and demonstrations by authorities of national reputation, as well as exhibits of inventors, manufacturers, supply merchants and queen rearers. A special invitation is extended to all beekeepers to display and demonstrate inventions, implements or methods. If table space is desired or special equipment is to be prepared, notice should be sent to Dr. Burton N. Gates, Amherst, Mass. The college provides covered tables for the exhibits.

## B. SUMMER SCHOOLS.

1. **THE SUMMER SCHOOL OF AGRICULTURE AND COUNTRY LIFE.** — The Summer School of the Massachusetts Agricultural College will open June 28, 1915, for a term of five weeks. The work of the summer school was designed originally for teachers, and the attendance has been largely of that class. Special attention will be given to the needs of teachers again this year. It has been found, however, that there are many persons who seek a general knowledge of theoretical and practical agriculture, and who can come to the college conveniently during the summer season. Extended courses are offered for the benefit of such persons.

The formal instruction in the summer school is given in definite courses herein described. From these each student may elect not less than 10 nor more than 15 exercises a week, unless a larger or smaller amount of work is allowed by the supervisor. These courses include a large amount of field work, observation trips, outdoor exercises and laboratory experiments.

Besides these, general field exercises are arranged for one afternoon of each week. These are on topics of interest to all. Excursions are arranged for

every Wednesday afternoon, and more extended excursions for the whole school are planned for every Saturday. These excursions are in charge of an instructor. In the past they have proved a very enjoyable feature of the work. Round-table and special discussions are arranged by various instructors as their courses require.

A course of evening lectures on popular topics relating to the work of the school is a feature of the general program. This lecture course is free to all students.

Early registration is desirable. Registration fee for the summer school is \$5, payable at the time application is made. No other tuition is charged. This fee should accompany application blank and should be made payable to the Supervisor of Short Courses or the College Treasurer.

2. **THE SCHOOL FOR RURAL SOCIAL SERVICE.** — The Massachusetts Agricultural College offers a School for Rural Social Service in connection with the usual Summer School of Agriculture and Country Life. The courses offered give instruction, furnish information and direct the attention of those interested more particularly to the rural field, which has as yet received little systematic study when compared with that which has been given city conditions.

The courses offered are intended for clergymen, teachers, librarians, town officers, grange workers and others who devote a considerable portion of their time to problems of community development. Courses 35 to 47, inclusive, are designed for the needs of these persons. All other courses given during this period are also open to those who register. There is a registration fee of \$1 for those attending this school.

3. **THE CONFERENCE ON RURAL COMMUNITY PLANNING.** — This conference is held as a closing feature of the summer school each year. In it the larger problems of New England community development are taken up. The following organizations co-operate with the college in providing the programs: the Massachusetts Federation of Churches, the State Board of Education, the State Grange, the Free Public Library Commission, the Massachusetts Civic League, the State Board of Health, the County Work of the Y. M. C. A., the New England Home Economics Association and the Bureau of Statistics.

Section meetings of these groups are held each forenoon, a general round-table discussion is held each afternoon, and lectures are delivered each evening by persons prominent in social and educational work. Many small group conferences are also arranged.

Extensive exhibits, showing in a graphic way what organizations and communities are doing along welfare lines, are arranged at the time of the conference.

This is a four-day conference and is scheduled for July 27 to 30, 1915. A full program is published about June 1. There are no registration or other fees.

4. **BOYS' AGRICULTURAL CAMPS.** — During the month of July several camps are arranged in order that boys from rural districts and small towns may receive some instruction in agriculture and clean, wholesome sports, and that they may have impressed upon them their responsibilities as coming members of society. The daily program consists of camp duty, flag raising, agricultural lessons, talks on hygiene and good citizenship, play and recreation, instruction in handicrafts, photography, evening camp fires, and lectures by men prominent in boys' work. A small fee is charged to help defray the cost of board and incidental expenses.

5. **POULTRY CONVENTION.**— In order to give a large number of poultry-men, who cannot come to the college for a long period of time, practical instruction in modern methods of breeding, feeding, poultry-house construction, operation of incubators and brooders, selecting and judging poultry for utility and for show, and in marketing poultry products, an annual three-day convention is offered. This will be held from July 21 to 23, 1915, inclusive.

The faculty of the 1914 summer schools was as follows:—

KENYON L. BUTTERFIELD, LL.D., President of the College and Head of the Division of Rural Social Science.

WILLIAM D. HURD, M.Agr., Director of the Extension Service and Supervisor of Short Courses.

HERBERT J. BAKER, B.Sc., Extension Instructor in Farm Management.

JOHN L. BYARD, Superintendent of the Apiary.

JOHN R. BOARDMAN, New York City, Lecturer on Rural Leadership.

JENNIE BUELL, Ann Arbor, Mich., Lecturer, Michigan State Grange.

ALEXANDER E. CANCE, Ph.D., Associate Professor of Agricultural Economics.

JOSEPH S. CHAMBERLAIN, Ph.D., Professor of Organic and Agricultural Chemistry.

WILLIAM D. CLARK, M.F., Professor of Forestry.

Laura Comstock, Extension Professor of Home Economics.

SAMUEL COONS, Instructor in Dairying.

PHILIP H. ELWOOD, Jr., B.Sc.Agr., Extension Instructor in Civic Improvement.

R. HAY FERGUSON, Extension Professor of Agricultural Economics.

HENRY T. FERNALD, Ph.D., Professor of Entomology, Chairman of Division of Science.

G. WALTER FISKE, LL.D., Oberlin, O., Dean, Oberlin Theological Seminary.

BURTON N. GATES, Ph.D., Assistant Professor of Beekeeping.

HAROLD M. GORE, B.Sc., Assistant in Physical Education.

JOHN C. GRAHAM, B.Sc.Agr., Professor of Poultry Husbandry.

CHARLES R. GREEN, B.Agr., Librarian.

F. JOSEPHINE HALL, A.M., Waltham, Mass., Adviser for Women.

SIDNEY B. HASKELL, B.Sc., Associate Professor of Agronomy.

ERNST HERMANN, Newton, Mass., Director, Playground Association.

CURRY S. HICKS, B.Sc., Associate Professor of Physical Education and Hygiene.

LORIAN P. JEFFERSON, A.M., Expert Secretary, Division of Rural Social Science.

ELIZABETH JENKINS, Sandwich, Mass., Graduate Student, University of Wisconsin.

WILLIAM CHAUNCY LANGDON, New York City, President American Pageant Association.

WILLIAM P. B. LOCKWOOD, B.Sc.Agr., Professor of Dairying.

A. H. MACLELLAN, Lecturer in Horticulture, MacDonald College, Quebec.

FREDERICK A. MCLAUGHLIN, B.Sc., Instructor in Botany.

JOHN A. MCLEAN, A.B., B.Sc.Agr., Associate Professor of Animal Husbandry.

KATHLEEN MARSH, Lowell, Mass., Lowell Normal School.

CHARLES J. MAYNARD, West Newton, Mass., Author and Lecturer on Bird Life.

ORION A. MORTON, Extension Professor of Agricultural Education.

EZRA L. MORGAN, A.M., Extension Professor of Community Organization.

ETHEL H. NASH, Extension Assistant in Agricultural Education.

ARNO H. NEHRING, Associate Professor of Floriculture.

A. VINCENT OSMUN, M.Sc., Associate Professor of Botany.

SAMUEL R. PARSONS, B.Sc., Instructor, Pennsylvania State College.

CHARLES A. PETERS, Ph.D., Associate Professor of Inorganic and Soil Chemistry.

EDWARD TALLMADGE ROOT, Boston, Mass., Secretary, Federation of Churches of Massachusetts and Rhode Island.

FREDERICK W. RIED, Framingham, Mass., Director of Practical Arts, State Normal and Training schools.

FRED C. SEARS, M.Sc., Professor of Pomology.

LEONE E. SMITH, B.S., Scout Master, Boys' Camps.

GEORGE E. STONE, Ph.D., Professor of Botany.

FRANK A. WAUGH, M.Sc., Head of Division of Horticulture and Professor of Landscape Gardening.

A bulletin describing the summer schools is issued in March each year, and may be had upon application to the Supervisor of Short Courses.

## C. MISCELLANEOUS SHORT COURSES.

1. **SHORT COURSES FOR SPECIAL GROUPS.** — Plans are now under way to provide short courses at Amherst, lasting four or five days, for fertilizer agents, feed agents and dealers, milk inspectors, seed dealers, and other groups desiring such instruction. Information concerning these may be obtained by writing the Extension Service.

2. **SPECIAL DAYS FOR FOREIGNERS.** — Each year there are provided at the college special days for foreigners, especially the Polish farmers, of whom there are many in the Connecticut valley. Instruction is given in the phases of agriculture to which this section is best adapted. Instruction is given in soil management, co-operation, American citizenship and history. Similar work among foreigners will be arranged at the College, or in different sections of the State.

3. **MEETINGS OF ORGANIZATIONS AT THE COLLEGE.** — It is customary for the various State organizations of fruit growers, poultrymen, breeders' associations and others to meet for conventions and picnics at the college. Such meetings are welcomed by the college authorities, and organizations are cordially invited to meet at the college. The Extension Service provides facilities for seeing the college grounds, and will assist in arranging programs and other forms of instruction and entertainment.

All requests for announcements or further information regarding any of the short courses should be addressed to the Supervisor of Short Courses, Massachusetts Agricultural College, Amherst, Mass.

## THE EXTENSION SERVICE.

**CORRESPONDENCE COURSES.** — The correspondence courses are offered in response to calls from all sections of the State from people who desire information on agriculture, home economics and country life problems, but who cannot come to the college for it. They are designed to meet the needs of farmers, dairymen, stock breeders, fruit growers, market gardeners, floriculturists, teachers, home makers and all others interested in the farm, the farm home and the rural community.

It is their purpose to present the latest information in such language that all who pursue the study can readily understand the work.

*Method of conducting Correspondence Work.* — Many books have been written on various agricultural subjects, yet very few are adaptable to the correspondence course work. For this reason the courses consist largely of specially prepared lessons. The subject-matter partakes somewhat of the lectures that are given in the college classes. Certain courses are based wholly on text-books, however, while a number combine both methods. In any case it is recommended that the student purchase one or two books for collateral reading. These can often be obtained from the local library.

The courses are especially recommended to granges, farmers' clubs, Y. M. C. A.'s, and similar organizations. If grange lecturers, club secretaries and other interested persons will organize study classes, and the size of the class or the interest in the subject is sufficient, the supervisor of correspondence courses will gladly meet with the class from time to time to discuss the work and offer suggestions. Below are listed the courses offered for 1915: —

1. Soils and Soil Improvement. Associate Professor HASKELL.
2. Manures, Fertilizers and Soil Amendments. Associate Professor HASKELL.
3. Field Crops. Assistant Professor McDONALD.
4. Farm Dairying. Professor LOCKWOOD.
5. Fruit Growing. Professors SEARS, CHENOWETH and Mr. REES.
6. Market Gardening. Mr. H. F. TOMPSON.
7. Animal Feeding. Mr. STORY.
8. Floriculture. Associate Professor NEHRING.
9. Farm Accounts. Professor FOORD.
10. Entomology. Professor FERNALD.
11. Pedagogy of Agriculture. Professor FERNALD.
12. Beekeeping. Associate Professor GATES.
13. Forestry. Professor CLARK.
14. Shade Tree Management. Associate Professor OSMUN.
15. Gardening and Elementary Agriculture. Extension Professor MORTON.
16. Poultry Husbandry. Professor GRAHAM.
17. Home Economics. Extension Professor COMSTOCK.
18. Rural Sociology. Mr. BAIRD.

*Enrollment for Correspondence Courses.*— Students may enroll in the courses at any time between October 1 and June 1 of the following year. It has been found advisable to discontinue the courses through the summer months, as farmers and other students cannot devote the necessary amount of time to the lessons at this season.

*Expenses of the Correspondence Courses.*— In order that none may enroll except those who are interested and desire to pursue earnest study, a small fee is charged. This has been fixed at \$1 for each course except Courses 8, 17 and 18, where it has been found advisable to charge \$1 for each of the parts. The fee is payable strictly in advance, at the time the enrollment card is sent.

*LECTURES AND DEMONSTRATIONS.*— The members of the faculty of the college are, when other duties will permit, available for lectures and demonstrations before granges, men's clubs, women's clubs, Y. M. C. A.'s, farmers' clubs, boards of trade, and other organizations. A list of more than 40 lecturers and 200 subjects on various phases of agriculture, country life, economics, sociology, education, civic betterment and various scientific subjects has been prepared. Full courses of lectures or single lectures may be arranged.

Organizations arranging the lectures are asked to pay the traveling expenses of the lecturer, provided no admission fee is charged. When admission is charged the lecturer is entitled to a fee in addition to traveling expenses.

*EXTENSION SCHOOLS.*— The extension schools are of two distinct types, the first being the Agricultural Extension School, dealing with the production side of farming and with the problems of the farm home; the second being the Extension School in Community Planning, having to do with the organization and selling end of agriculture and with instruction in the planning and carrying forward of various community activities.

*Agricultural Extension Schools.*— The college sends a corps of instructors to a town for a five-day school of instruction. At present the following courses are offered: soil fertility, animal husbandry and dairying, fruit growing, poultry husbandry and vegetable gardening for the men, and a home makers' course for the women. Morning and afternoon sessions only are held.

*Community Planning Extension Schools.*— These schools are arranged to extend over at least three days. The following courses are offered: education, agricultural organization, community program, civic improvement, farm management, town administration, public health, community recreation and

home making. Morning, afternoon and evening sessions are held in these schools.

It is also possible to arrange special extension schools along one line of work, such as fruit growing, dairying, etc.

Communities desiring an extension school make a written request, agreeing to defray all local expenses, such as the rent, heating and lighting of a suitable hall, and the board of the instructors during the school.

EDUCATIONAL EXHIBITS AT FAIRS AND OTHER SHOWS. — The college co-operates with the managers of fairs, industrial expositions, corn shows, poultry shows, fruit shows and other exhibitions by making educational exhibits.

For outside work a large tent has been provided. In this about thirty cabinets containing educational material are arranged. A corps of lecturers and demonstrators accompany the exhibit and give practical instruction daily.

For inside work a space at least 40 by 60 feet is required for this exhibit.

Smaller exhibits along special lines are sent to corn, fruit and poultry shows, milk shows, child welfare exhibits, and so forth.

The managers of fairs and exhibits are required to partially meet the cost of presenting these exhibits.

EDUCATIONAL TRAINS. — The college, through the Extension Service, will co-operate with railroad and trolley lines in the operation of educational trains and cars. The railroad usually furnishes the means of transportation; the college prepares the exhibit and provides the lecturers and demonstrators.

#### EXTENSION WORK IN SPECIAL FIELDS.

EXTENSION WORK IN FRUIT GROWING. — This work includes lectures and demonstrations on laying out and planting orchards, pruning, spraying, thinning, grading, packing and marketing fruits. Demonstration orchards, new and renovation plots, are being established all over the State, under a co-operative agreement between the college and the owners of land. Extension schools in fruit growing and fruit grading and packing are arranged on request. Visits to farms for advisory work are made, and correspondence on orcharding subjects is invited.

EXTENSION WORK IN ANIMAL HUSBANDRY. — This work includes lectures, demonstrations and advisory assistance on subjects pertaining to cattle, horses, sheep and swine, as well as instruction in barn planning. Assistance in organizing dairy improvement associations and breeders' associations is given; stock-judging contests for boys are arranged at the leading fairs.

EXTENSION WORK IN DAIRYING. — This includes lectures and demonstrations on the handling and care of milk, cream, butter and cheese; Babcock testing, dairy utensils and dairying manufactures. Educational campaigns may be arranged in different communities, seeking to educate producers, dealers and consumers as to the production and distribution of clean, safe milk.

CONTROL WORK IN HOG CHOLERA. — This work is done co-operatively by the college and the United States Department of Agriculture. The work includes lectures upon the disease, demonstrations of inoculation of hogs with the anti-hog cholera serum, inspection of suspected herds and advisory assistance.

EXTENSION WORK IN POULTRY HUSBANDRY. — In addition to conferences at the college and visits to the plants of poultrymen, advice on general poultry



management, diseases, mating, laying out and planning buildings, this work includes co-operative work with State institutions, county schools of agriculture, agricultural departments in high schools, manual training departments in public and normal schools, exhibits of poultry appliances at fairs and shows and other incidental phases.

**EXTENSION WORK IN FARM MANAGEMENT, FIELD STUDIES AND DEMONSTRATIONS.** — This is carried on co-operatively between the college and the office of farm management of the United States Department of Agriculture at Washington. It consists of a study of farm conditions and farm management problems; instruction in keeping farm accounts and growing field crops; the use of fertilizer and lime; advice as to farm equipment, buildings, and so forth.

**EXTENSION WORK IN CIVIC IMPROVEMENT.** — This is carried on in connection with the department of landscape gardening at the college. Assistance is rendered in various rural and village improvement enterprises, such as the planting and care of shade and street trees, the planning of playgrounds, school grounds, cemeteries, picnic grounds, the beautifying of water fronts, the rearrangement and development of town commons and reservations of historic interest, and similar activities. Efforts are made to co-operate with local granges, men's and women's clubs, village improvement societies, and like organizations.

**EXTENSION WORK IN AGRICULTURAL EDUCATION.** — This is an organized effort to promote in the public schools of the State the study of agriculture and practical arts relating to country life. This is accomplished by means of conferences with school officials and school patrons, the promotion of agricultural clubs among the school children, and lectures before granges, farmers' clubs and other interested organizations. The work of the agricultural clubs is under the direction of the superintendent of schools or of some one recommended by him. Each town should hold an annual exhibit of products. Exhibits representing rather extensive districts are incorporated with the various agricultural fairs in the State. In this manner elementary instruction in agriculture is promoted by the combined efforts of the public schools, of the patrons of the schools through their agricultural fairs, and of the Agricultural College.

**EXTENSION WORK IN HOME ECONOMICS.** — The Extension Service, through its home economics workers, stands ready to assist in solving problems relative to the household in the same manner as it is endeavoring through other workers to aid in working out problems of the farm. The work includes lectures and demonstrations, assistance in forming girls' clubs and home economics clubs for women, and co-operation with existing organizations in the matter of interesting young people in the proper care of the home.

**EXTENSION WORK IN COMMUNITY PLANNING.** — A number of communities in the State have appealed to the college for aid in bringing the various organizations in the community to a higher state of efficiency, in order that they themselves might take definite steps toward community development and advancement. The college is now prepared to make scientific studies of communities which lead up, by means of surveys, to the organization of local committees to study the agricultural, educational, religious, transportation, recreation and civic needs of the communities. Several State organizations and some national organizations are usually brought in to aid in working out the plans presented by these committees. Conferences on community affairs

are held upon request. The college acts merely in an advisory capacity, the communities themselves doing the actual organization work.

**DEMONSTRATION AUTO-TRUCK.** — In order to reach all communities of the State more effectively, a demonstration auto-truck has been procured. Equipped with spraying apparatus and pruning tools, and with Babcock milk tester and other dairy apparatus, dairy record blanks, farm account blanks, a radiopticon with pictures for illustrative purposes, books, bulletins and pamphlets, this outfit, in charge of a competent instructor or demonstrator, visits towns and farms of the State upon request. The instructor gives lectures and demonstrations appropriate to the agriculture of the community.

**LIBRARY EXTENSION WORK.** — This consists principally of loaning to the public libraries of the State general collections of 10 to 30 books and bulletins on agriculture and related subjects. Special collections of smaller size on specified subjects, such as fruit growing, dairying, poultry, beekeeping, home economics, and so forth, are also sent out. These may be kept from four to eight weeks, according to the demand for them. The only expense to local libraries is transportation charge on the books both ways. The college library also supplies, upon request, information regarding books on agriculture and related subjects.

**AGRICULTURAL SURVEYS.** — To acquire definite information as to existing conditions in rural communities, to be used as a basis for further extension work, agricultural surveys are made. The different organizations and officials in the community, such as the town officers, superintendent of schools and teachers, clergymen, librarians and others, usually co-operate in making such surveys. The survey covers all phases of community life, including soil survey, farm management practices, and the educational, social, religious and recreational life. The inventory is made upon carefully prepared blanks.

**AGRICULTURAL CO-OPERATION AND MARKETING.** — This work has for its object the establishment of agriculture on a better business basis. Assistance is given in organization of co-operative buying and selling associations, the securing of rural credit, the adoption of better methods of marketing, the establishment of a better market for agricultural produce and other lines of agricultural co-operation.

**MASSACHUSETTS AGRICULTURAL COLLEGE AGRICULTURAL IMPROVEMENT ASSOCIATION.** — This is an organization of ex-students of the college who are now farming in the State and who have banded themselves together for the purpose of promoting the agricultural development of the State by carrying on experiments and demonstrations for the betterment of rural pursuits, by using and encouraging the use of better seeds and animals, by the organization of co-operative societies, and by the dissemination of literature bearing on recent agricultural investigations. Production of high-grade strains of corn and potatoes for the Massachusetts seed trade and work for the improvement of animals are some of their activities.

**DEMONSTRATION FARMS AND PLOTS.** — Believing that one of the most effective ways of teaching modern farm practice is by the establishment of demonstrations (not experiments) in all sections of the State, thus showing a man on his own land and under his own conditions the result of proper farm practices, the college is placing demonstration plots throughout the State, showing the proper fertilization for grass and other crops, the results of rotations, the proper care of orchards and dairy management. For several years the Faunce Demonstration Farm has been under the advisory direction

of the college, as is also the Paige farm at Hardwick. The Faunce farm has proved to the Cape Cod region that small fruits, poultry and vegetables can be successfully grown there. Demonstration farms are usually managed by a committee or board of trustees representing the farm and a committee appointed from the college acting jointly.

COUNTY OR DISTRICT AGRICULTURAL AGENTS. — As rapidly as State, government and local funds are available, men trained in agriculture are being assigned to counties and districts of the State to act as agricultural agents. Residents of the county or district may, without cost, call upon the agent for assistance upon any agricultural subject. The work is being developed through the co-operation of the United States Department of Agriculture, the college and the community engaging the agent.

ADVISORY WORK WITH INSTITUTIONS AND INDIVIDUALS. — Special effort is made to comply with as many of the requests of State institutions and individuals who ask for advice on farm problems as possible. The force of instructors available for this work is at present insufficient to take care of all the demands.

PUBLICATIONS OF THE EXTENSION SERVICE. — In addition to the regular circulars and bulletins which announce the various short courses and lines of work mentioned, a monthly pamphlet, "Facts for Farmers," giving timely information on agricultural subjects, is issued. Large numbers of helpful circulars and bulletins are annually distributed. Reports of the work of the Extension Service, dairy record blanks, farm account blanks, boys' and girls' club circulars, lists of books, and so forth, may be had upon request.

CO-OPERATION WITH OTHER ORGANIZATIONS. — The aim of the Extension Service is to co-operate with existing organizations so far as possible. It is, therefore, glad to work with local organizations, and welcomes suggestions from such organizations as town officers, local granges, farmers' clubs, women's clubs, Y. M. C. A.'s, Y. W. C. A.'s, boards of trade, village improvement societies, teachers, clergymen, librarians and others interested in agriculture and country life.

INFORMATION BY CORRESPONDENCE. — Besides the activities mentioned, hundreds are helped through personal visits to farms, and still larger numbers through letters of inquiry, which always receive the most careful attention from every department of the institution.

STUDENT EXTENSION WORK. — The Social Service Commission of the college is an organization supported by voluntary subscription. The commission employs an executive officer known as the Social Service Secretary, who, in co-operation with the Extension Service, endeavors to assist the students of the college in doing such extension work as their duties may permit. This consists of lectures and demonstrations on agricultural subjects, teaching English and civics to foreigners, coaching and supervising athletic contests with boys and girls, helping to organize and conduct debating societies and Bible classes, giving talks on true sportsmanship and clean living, giving musical entertainments, and acting as judges and helpers at fairs and other exhibits.

Pamphlets and bulletins are sent free to all who apply for them, and correspondence from any who desire such help as has been mentioned should address the Director of the Extension Service, Massachusetts Agricultural College, Amherst, Mass.



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GENERAL INFORMATION.

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# GENERAL INFORMATION.

## A. FINANCIAL AND ADMINISTRATIVE.

### STUDENT EXPENSES.

**TUITION.**<sup>1</sup> — Tuition is free to residents of Massachusetts. Students who are not residents of Massachusetts are charged a tuition fee of \$40 a year. The tuition charged persons not citizens of the United States is \$120 a year. Students entering from Massachusetts are required to file with the president a statement signed by either town or city clerk stating that the applicant's father is a legal resident of Massachusetts; a similar statement is required of those entering from other States.

Beginning Sept. 1, 1915, all students entering the college for the first time as undergraduates or special students will be charged a matriculation fee of \$5, which in event of a student leaving the institution shall, if all bills due the college are paid, be remitted, or which shall upon graduation be considered as payment for the diploma.

**DORMITORIES AND BOARD.** — The college has dormitory accommodations for about 62 students. The rooms in the dormitories are occupied by the upper classmen, hence new students find it necessary to room in private houses. The rooms in the college dormitories are unfurnished; for the most part they are arranged in suites of three, — one study room and two bedrooms. These rooms are heated by steam and lighted by electricity; they are cared for by students occupying them. The dormitory rent for each person varies from \$39 to \$66 a year. The rent for furnished rooms in private houses ranges from \$1 to \$3 a week for each occupant. Correspondence in regard to rooms should be addressed to the dean of the college.

Board may be obtained at the college dining hall. At present the price of board there is about \$4 a week. Board is furnished at cost, the price being determined by adding 5 per cent. to the audited rate for the previous three months, and at the end of the period final settlement is made on the basis of actual cost.

### EXPENSES.

The necessary college expenses are estimated as follows:—

Tuition: citizens of Massachusetts free; other citizens of the United States, \$40 a year; foreigners, \$120 a year.

	Low.	High.
Matriculation fee, first year, . . . . .	\$5 00	\$5 00
Room in college dormitories or in private houses, . . . . .	39 00	110 00
Board in college dining hall, \$4 a week, . . . . .	144 00	144 00
Laundry, 50 cents to 85 cents a week, . . . . .	18 00	30 00
Military uniform, first year, . . . . .	17 85	17 85
Laboratory fees, . . . . .	2 00	20 00
Books, stationery and miscellaneous items, . . . . .	14 15	23 15
	<hr/>	<hr/>
	\$240 00	\$350 00

<sup>1</sup> This statement applies to those registering as regular or unclassified students.

OTHER EXPENSES.—Prospective students should understand that the above estimates cover expenses which may be called strictly college expenses, and that there are other financial obligations voluntarily placed upon students which they should expect to meet. Chief among these are class assessments and taxes levied for maintenance of various organizations, such as the Social Union, Athletic Association, weekly publications, etc. Such expenses vary from \$15 to \$30 a year. Additional financial responsibility is also assumed by students joining a fraternity or entering into other social activities of the college. Students rooming in college dormitories are obliged to equip their own rooms with furniture. The college assumes no responsibility in regard to the safe keeping of student property either during the college term or vacations, except under such special arrangement as may be made with the treasurer. Besides the amount necessary for clothes and traveling, the economical student will probably spend between \$275 and \$375 per year.

#### INITIAL CHARGES.

At the opening of the college year, before students are registered in their classes, the following charges are payable at the treasurer's office:—

	Freshmen.	Sophomores.	Juniors and Seniors.
Matriculation fee, . . . . .	\$5 00	—	—
Board (if at college dining hall) four weeks in advance,	16 00	\$16 00	\$16 00
Subscription to "Collegian" (college paper), <sup>1</sup> . . .	1 50	1 50	1 50
Assessment for support of Social Union, . . . .	1 50	1 50	1 50
Laboratory fees:—			
Chemistry, . . . . .	5 00	—	—
Zoölogy, . . . . .	—	2 00	—
For elective subjects, . . . . .	—	—	1 00-10 00
Military uniform, . . . . .	17 85	—	—
Room rent (if in college dormitory), . . . . .	—	—	19 50-33 00
Student tax for support of athletics, <sup>1</sup> . . . . .	8 00	8 00	8 00
	\$54 85	\$29 00	\$47 50-\$70 00

<sup>1</sup> While this is not essentially a college charge, the treasurer of the college acts as collector for the student activity, and all students are expected to make the payment as indicated. The subscription price of the "Collegian" is fixed by the managers; the amount of athletic tax by vote of the student body.

#### LABORATORY FEES.

The principles observed in establishing laboratory fees are the requirement that students pay for those materials actually used which cannot be supplied by the individual, and that the laboratory fees include a charge sufficient to guard against wanton waste and breakage. Fees may be established for any course without previous announcement. At present, the fees charged are as follows:—



	Per Semester.
Agronomy: —	
Course 3, . . . . .	\$1 50
Course 4, . . . . .	50
Courses 5 and 6, . . . . .	1 00
Animal husbandry: —	
Courses 2 and 4, . . . . .	1 00
Course 7, . . . . .	2 00
Botany: —	
Courses 2, 3, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, . . . . .	3 00
Course 4, . . . . .	2 00
Course 5, . . . . .	1 00
Chemistry: —	
Courses 1, 2, 7, 8, 13, 15, . . . . .	3 00
Courses 3, 4, 5, 6, . . . . .	4 00
Courses 9, 10, 11, 12, 14, 16, . . . . .	5 00
Dairying: —	
Courses 1, 2, 3, . . . . .	1 00
Entomology: —	
Courses 3, 4, . . . . .	3 00
Landscape gardening: —	
Landscape gardening 1, 2, . . . . .	2 50
Landscape gardening 3, 4, 7, 8, . . . . .	3 00
Landscape gardening 6, . . . . .	1 00
Drawing 1, 2, . . . . .	2 50
Mathematics: —	
Courses 6, 10, . . . . .	1 00
Microbiology: —	
All courses, each, . . . . .	5 00
Pomology: —	
Courses 3, 4, . . . . .	2 50
Poultry Husbandry: —	
Course 3, . . . . .	1 50
Course 4, . . . . .	2 00
Zoölogy: —	
Course 1, . . . . .	2 00
Courses 3, 4, . . . . .	4 00

#### STUDENT AID.

SELF HELP. — Many students are obliged to find work of some sort to earn their way through college. A few men have met their entire expenses in this manner, many more have paid a large part of their expenses, and many have earned a small proportion of the cost of their college education; but the college recommends that no new student enter without having at least \$150 with which to pay his way until he can establish himself in some regular work. The college does not encourage students to enter without money in the expectation of earning their way entirely. The ordinary student will find it better either to work and accumulate money before coming to college, or to take more than four years in completing his college course, or, instead, to borrow money sufficient to carry him through. No student should under-

take work that interferes with his studies, and students should understand that, owing to the large number of applications for employment, no one man can receive a large amount of work at the college. A number of students find opportunities for earning money without depending upon the college to furnish them with work.

So far as possible needy students will be employed in some department of the college. The divisions of agriculture and horticulture usually afford the most work, although there are several permanent janitorships available for students, and sixty or more students are employed at the dining hall. Application for student labor should be made directly to the President. Applicants are required to present statements from parent or guardian and from a selectman or alderman of the town or city in which they reside, showing that the applicant needs assistance. Students whose department or class work is not satisfactory are not likely to be continued in student labor. The most desirable and responsible positions are naturally assigned to those needy students who have been in the institution longest and who have demonstrated their need and ability. Students, therefore, may find it rather difficult to obtain all the work they desire during their freshman year; as a matter of fact, however, any student who is capable of doing a variety of things, and who is a competent workman, usually finds little difficulty in obtaining all the work that he can do from the outset.

**SPECIAL NOTICE TO NEEDEY STUDENTS.**— In the last few years the demand for paid labor on the part of new students has far exceeded the amount of employment that the college can offer. The college cannot promise work to any student, particularly to freshmen; it accordingly urges prospective students who are dependent entirely upon their own efforts not to undertake the course before they have earned enough money to carry them through, or nearly through, the first year.

#### **STUDENT ACCOUNTS.**

The following rules are enforced concerning student accounts:—

No student will be allowed to graduate until all bills due the institution from him are paid.

College charges, such as room rent, laboratory fees and tuition, must be paid in advance, at the beginning of each semester. This rule is strictly adhered to, and no student will be allowed to register in his class until such payments are made.

Every student boarding at Draper Hall is required to pay at the beginning of each semester at least one month's board in advance; and no student will be allowed to continue to board at Draper Hall if at any time during the semester he is more than one week in arrears in his payment for board.

All money due for student labor shall at the discretion of the treasurer of the college be applied on account toward any bills that a student may owe to the institution.

#### **STUDENT RELATIONS.**

The customary high standard of college men in honor, manliness, self-respect and consideration for the rights of others constitutes the standards of student deportment.

Any student known to be guilty of dishonest conduct or practice must be reported by the instructor to the President for discipline.

The privileges of the college may be withdrawn from any student at any time, if such action is deemed advisable.

It should be understood that the college, acting through its President or any administrative officer designated by him, distinctly reserves the right not only to suspend or dismiss students, but also to name conditions under which students may remain in the institution. For example, if a student is not doing creditable work he may not only be disciplined but he may also be required to meet certain prescribed conditions in respect to his studies, even though under the foregoing rules his status as a student be not affected. The same provision applies equally to the matter of absences ("cuts"). According to the rules a student is allowed a certain percentage of absences from class and other exercises. This permission, which implies a privilege and not a right, may be withdrawn at any time for any cause.

Similarly, also, it applies to participation in student activities. Though this will ordinarily be governed by the rules as already laid down, yet, if in the judgment of the college authorities a student is neglecting his work on account of these activities the privilege of participating in them may be withdrawn for such time as is considered necessary. Moreover, it may be withdrawn as a punishment for misconduct. Prospective students or their parents may, upon application, obtain a copy of the faculty rules governing student relations to the college.

## B. COLLEGE ACTIVITIES.

### GENERAL EXERCISES.

Chapel exercises are as a rule held four mornings each week. On Wednesday, instead of chapel an afternoon assembly is held, to which some prominent layman or professional man is invited to speak. The object of these assemblies is to bring to the students discussions of topics of present-day interest. A special chapel service on Sunday is usually held during the winter months. Students are required to attend these general exercises, although the President is authorized to excuse from chapel any student who may object to attendance thereon because of his religious scruples, provided his request for excuse therefrom is endorsed by his parent or guardian.

### STUDENT ACTIVITIES.

A large number of student organizations furnish opportunity to students for work and leadership.

The Massachusetts Agricultural College Social Union was established about six years ago. All students become members of the Union by paying a small fee. The Union is designed to become the center of student interests. In North College it has a trophy room and a large lounging room for music, reading and study; in the basement of this building there is also a game room for pool and billiards. In the fall and winter months the Union gives a series of entertainments, free to students and faculty.

The College Senate is composed of representatives of the junior and senior classes. This body serves as a general director of undergraduate conduct, and represents before the faculty the interests of the student body.

The M. A. C. Christian Association is active both socially and religiously. Under its direction voluntary Bible classes are conducted during the winter months. A Catholic Club has also been organized.

The musical organizations include an orchestra, a mandolin club and a glee club. These furnish music for college meetings, and occasionally give concerts at the college and at other places. A military band is maintained as part of the cadet corps.

A Dramatic Club has been organized, and each year presents a play.

The Press Club, organized in 1913-14, has headquarters in the English-Journalism room, but is soon to have a news room of its own in North College.

The Public Speaking Council represents the students' interest in debate and oratory.

The Athletic Association represents in the college the interests of football, baseball, track, hockey and tennis.

A Rifle Club has been organized for a few years. Teams representing this club have repeatedly won the intercollegiate championship of the country, both in indoor and outdoor contests.

The college publications are the "Massachusetts Collegian," published weekly by the student body, and the "Index," published annually by the members of the junior class.

The Stockbridge Club is an organization of students especially interested in practical agriculture and horticulture. Regular meetings are addressed by outside speakers, and members present papers and engage in discussions.

Scientific clubs also exist in the departments of French, entomology, landscape gardening and zoölogy.

There has recently been organized a Collegiate Country Life Club, the membership of which is composed of faculty and students who are particularly interested in the study of country life problems.

## C. ACADEMIC AND DEPARTMENTAL.

### DEGREES.

Those who complete a four-year course receive the degree of bachelor of science. The fee for graduation from the college is \$5.

Graduate students who complete the assigned courses will receive the degree of master of science upon the payment of a fee of \$10. Credit may sometimes be allowed towards this degree for teaching or other advanced work done in some department of the college.

Graduate students who complete the required three-year course of study, and present a satisfactory thesis, will be granted the degree of doctor of philosophy.

Those to whom degrees are awarded must present themselves in person at commencement to receive them. No honorary degrees are conferred.

The honorary fraternity of Phi Kappa Phi has a chapter at the agricultural college. Students are elected to membership to this fraternity on the basis of scholarship. Elections are made from the highest fifth of the senior class who have attained an average grade of at least 85 per cent. during their college course.

### PRIZES.

Prizes are given annually in several departments for excellence in study or for other special achievement. Prizes offered in 1914 were:—

AGRICULTURE.—The Grinnell prizes (first, second and third), given by the Hon. William Claflin of Boston in honor of George B. Grinnell, Esq.,

of New York, to those members of the senior class who pass the best, second best and third best examinations, oral and written, in theoretical and practical agriculture. They are \$25, \$15 and \$10.

**ANIMAL HUSBANDRY.** — The F. Lothrop Ames Prize, given by F. Lothrop Ames, Langwater Farms, North Easton, Mass., consisting of \$150 a year, offered for a period of five years, beginning 1912, to be given to the three students standing highest in the work of advanced live-stock judging, and to be used in defraying their expenses incurred by participation in the students' judging contest at the National Dairy Show, Chicago.

**BOTANY.** — The Hills prizes, given by Henry F. Hills of Amherst, amount to \$35 annually. Competition is open to members of the senior, junior and sophomore classes as follows: for the best herbarium, \$20; for the second-best herbarium, \$15. No collection deemed unworthy of a prize will be considered.

**ENTOMOLOGY.** — In 1914 a special prize of \$5 was offered to that member of the junior class presenting the best collection of insects.

**GENERAL IMPROVEMENT.** — The Western Alumni Association prize (\$25) is given to that member of the sophomore class who, during his first two years in college, has shown the greatest improvement in scholarship, character and example.

**PUBLIC SPEAKING.** — The Burnham prizes are awarded as follows: to the students delivering the best and second best declamations in the Burnham contest, \$15 and \$10, respectively. The preliminary contests in declamation are open, under certain restrictions, to freshmen and sophomores.

The Flint prizes are awarded as follows: to the students delivering the best and second best orations in the Flint contest, a gold medal and \$20 and \$15, respectively. The preliminary contests in oratory are open, under certain restrictions, to all regular students.

The prizes in debate are awarded as follows: to each of the three students ranking highest in the annual debating contest, a gold medal and \$15. The preliminary contests in debate are open, under certain restrictions, to all regular students.

#### **EQUIPMENT.**

**AGRICULTURAL EDUCATION.** — The courses in this department are planned primarily for those who are preparing to teach. The work is carried on by means of lectures, library and demonstrations. The department has an office, lecture room and a laboratory in the Veterinary Science building. The laboratory is equipped with a balance, dishes, jars, reagent bottles, test tubes, petri dishes, lenses, a Babcock test, a Wisconsin sediment test, Bunsen burner, hot and cold water, electricity, gas and other appliances for giving demonstration and practice lessons in Secondary Agriculture. There is also equipment for conducting children's gardens on the campus. Instruction in school gardens constitutes a part of the practice work of those training for the occupation of teaching. Some practice work in teaching is done in the grammar grades of the Amherst schools, and in the agricultural departments of Hopkins' Academy, and Smith's Agricultural School at Northampton. This department is also intimately related to the matter of recommending candidates for teachers' certificates. At least four courses in the department are required of students preparing for such certificate. The office is supplied with school and college reports, also a large number of pamphlets and bulletins

relating to the subject of agriculture in the schools, courses of study, etc. See note relative to teachers' certificates, under major in Agricultural Education.

**AGRONOMY.** — The work in agronomy is carried on by means of lectures, laboratory work and field work. The laboratories are in the north wing of South College. The seed laboratory is equipped with samples of the different grains and seeds of plants of economic importance in field culture, and with apparatus for the study and testing of these seeds, including microscopes and the apparatus necessary for viability and purity tests. The soil laboratory is equipped with apparatus for studying the physical properties of soils, and with tools used in the reclamation of land by drainage and by irrigation. A large part of the work is done in the field, the college farm being used as a laboratory.

**ANIMAL HUSBANDRY.** — An accurate and definite knowledge of the market types and grades, and of the various breeds of live stock, is fundamental to the work of this department. The department is equipped with an excellent laboratory, Grinnell Arena, which has a seating capacity of 180, and which is fully adapted to the requirements. There are upwards of 125 head of dairy cattle of various ages available for class-room work; among these are included superior representatives of the Jersey, Guernsey, Ayrshire and Holstein breeds. There are flocks of pure-bred Shropshire and Southdown sheep of the best breeding and individuality. Considerable numbers of pure-bred Berkshire and Yorkshire pigs are maintained. The college possesses pure-bred Percherons and French coach horses, besides many work teams of different types, which are available for class-room purposes. A set of plaster of Paris models of individuals of foreign and domestic breeds of horses, cattle, sheep and swine, and a collection of the different foodstuffs available for the use of the New England farmer, are included in the equipment for this work. An excellent set of upward of 250 lantern slides, portraying the leading prize-winning, producing, and breeding animals of the leading breeds, — horses, cattle, sheep and swine, — belongs to this department, and is regularly used in instructional work. This equipment is being added to from time to time as funds are available.

**BOTANY.** — The department of botany occupies Clark Hall, a brick building 55 by 95 feet, two stories high, with basement and attic. It has two lecture rooms, one seating 154 and the other seating 72 people; one seminar and herbarium room; a large laboratory for sophomore and junior work, and one for senior work; and three rooms specially fitted for graduate students. The experiment station laboratories devoted to botanical research are also in this building. A small museum contains material especially useful in the teaching and illustration of plant phenomena; and on the third floor is a collection of Massachusetts timber trees, specimens showing peculiar formations of plant growth, and various specimens illustrative of scientific methods of treating trees.

The laboratories and lecture rooms are of modern construction, finely lighted and supplied with all necessary conveniences. The basement contains a bacteriological laboratory, a seed and soil room; and a convenient workshop provided with benches for wood and metal work, an electric motor, a power lathe, and other tools and appliances. In the senior laboratory is a room designed especially for physiological work; this laboratory is well supplied also with apparatus for the study of simple phenomena in plant

physiology, such as respiration, metabolism, transpiration, heliotropism, etc. The herbarium contains 18,000 sheets of flowering plants and ferns, 1,200 sheets of mosses, 1,200 sheets of lichens and liverworts, and about 20,000 specimens of fungi. The laboratory is equipped with 94 modern compound microscopes and a number of dissecting microscopes, microtomes and a large series of charts. A conservatory 28 by 70 feet is connected with the laboratory. This is designed for experiment work and for housing material often needed in the laboratory.

**CHEMISTRY.** — The college department of chemistry occupies the entire building previously known as the "old chapel." The basement is used for the storage of apparatus and chemicals. The first floor contains large laboratories devoted to organic, physiological and physical chemistry, and qualitative analysis. The second floor is occupied by the general lecture room, by offices for the several members of the staff and by laboratories for analytical chemistry. The third floor has been fitted for work in general chemistry, and has desk room and hoods sufficient to accommodate 66 students at one time. Each place is supplied with reagents and apparatus for independent work. This floor is also occupied by a lecture room that will seat 100 students.

The entire laboratory is well equipped with the necessary apparatus and chemicals for all students who desire to perfect themselves as expert chemists, or who wish to study chemistry as a supplement to some other line of practical or scientific work. The equipment includes a valuable and growing collection of specimens and samples of minerals, soils, raw and manufactured fertilizers, foods, milk products, fibers, various other vegetable and animal products and artificial preparations of mineral and organic compounds; and also a series of preparations for illustrating the various stages of different manufactures from raw material to finished product.

**DAIRYING.** — The dairy work is given in Flint Laboratory, a new building, designed for the dairy department. It contains large, well-lighted, sanitary and well-equipped laboratories. The equipment is new and of the best types of market milk and farm dairy machines.

**DINING HALL.** — Draper Hall, a brick colonial building, equipped with the modern conveniences of a dining hall, was opened in 1903. The dining service is under the supervision of the college. The building contains a limited number of rooms for young women students.

**DRAWING.** — The class in drawing occupies a room on the second floor of Wilder Hall. It is equipped with tables and adjustable drawing stands. The necessary materials and implements are provided. The equipment includes drawing models, and plaster casts of leaves, flowers, fruits, human and architectural details, and garden ornaments, two universal drafting machines, an eidograph, centrolineads, a set of ship splines and French curves, complete water-color outfits, automatic crosshatchers and protractors.

**ENTOMOLOGY.** — *General Entomological Laboratories.* — The equipment for work in entomology is perhaps unexcelled in this country. In the new fire-proof entomological and zoölogical building, first used in the fall of 1910, are fine lecture rooms, laboratories and museums for use in the different courses. The senior laboratory will accommodate 70 students at one time; a desk, equipped with compound microscope and accessories, together with glassware, reagents, etc., and supplied with electric light and gas is provided for each student. Dissecting microscopes, microtomes and other apparatus are available for use. The graduate laboratory is similarly equipped, and it

will accommodate 20 students. The large and rapidly growing collections of insects are in a room adjoining both laboratories. In the library of the building is an excellent collection of the more important books and journals treating of entomology, and many more are accessible in the college library and in the private libraries of the professors, in all making available more than 25,000 volumes, many of which cannot be found elsewhere in the United States. A card catalogue giving references to the published articles on different insects contains more than 60,000 cards, and is the largest index of its kind in the United States, and probably in the world. In the basement is a pump room where may be studied the construction of the different types of spray pump and methods of repairing them; hose, couplings, nozzles and the other parts of spraying outfits are provided, not only for examination but for use. In another room chemical desks and apparatus provide opportunities for the determination of the impurities and adulterations of insecticides. As the insectary of the Massachusetts Agricultural Experiment Station is in the same building the facilities it offers are also available. A greenhouse, where plants infested with injurious insects are under observation and experimental treatment, is also open to students. Photographic rooms with cameras and other photographic apparatus are provided, and the large greenhouses, gardens, orchards and grounds of the college offer further opportunities for the study of injurious insects under natural conditions.

ENTOMOLOGY. — *Beekeeping*. — For this work the main office, museum and lecture rooms are in the entomological building. There is also an apiary covering approximately two acres which will consist of about fifty colonies of bees in various types of hives and maintained for the several practical and experimental purposes. The apiary also includes a collection of nectar-yielding plants representative of the native flora as well as of the more important nectar sources from other localities. Especial opportunity is therefore given for a study of this fundamental problem of forage. Upon the apiary site is an eight-room building (the first in the world erected exclusively for teaching beekeeping) modeled to meet both the requirements of teaching and of a practical apiary. This building contains a boiler room, capacious wintering cellar, wax extraction room, general carpenter and work shop, laboratory, office, honey extraction room and stock room. The beekeeping equipment also includes an unexcelled collection of apicultural implements, natural history specimens and other curiosities. Practically every device used in American apiculture is available, it being the aim of the department to procure new inventions and implements as fast as they appear for the purpose of study and comparison. Available to the students is a private library of apicultural literature consisting of upwards of 900 volumes and papers, possibly the most complete collection in the country. This entire equipment is acknowledged unique in model and in completeness for the United States and for the world.

FARM ADMINISTRATION. — The college farm of 250 acres is under the general supervision of the Department of Farm Administration, and furnishes demonstration material. It includes improved land, pasture land and a farm wood lot. The improved land illustrates the value of good culture and the best known methods for the maintenance of fertility. The farm is equipped with suitable buildings and good machinery for the work carried on, of which the production of certified milk is an important branch. Several good farms in the vicinity, illustrating types of both special and general agriculture, may be inspected and studied.



**FLORICULTURE.** — The department of floriculture aims to give the student a thorough knowledge of all phases in greenhouse design and construction and greenhouse heating, and in the culture of florists' crops. It is intended to train men for commercial floriculture and for the management of conservatories on private estates and parks and in cemeteries. The course is outlined to combine theoretical, technical and practical work in the most comprehensive manner possible. Probably no agricultural college has a department of floriculture better equipped than this. There has been erected a durable, practical, commercial range, composed of palm, fern, orchid, violet, carnation, rose and students' houses. French Hall, with its large laboratories, class rooms and offices, furnishes excellent facilities for the purposes of instruction. Besides the new glass houses, there are older houses suitable for growing bedding plants and chrysanthemums, and frames for the growing of annual and herbaceous perennial plants, violets and pansies. Many excellent specimens of trees and shrubs are growing on the college grounds, furnishing valuable material for the study of plant materials.

**FORESTRY.** — The department of forestry has an unusually complete equipment of the various instruments used in forest mensuration, forest mapping and engineering, timber estimating, log scaling, board measuring, etc.; a large assortment of boards illustrative of the various commercial woods found in the lumber markets. The State Forest Nursery, comprising 6 acres of land and containing, approximately, 5,000,000 trees, transplants and seedlings is located on the college farm. Extensive forests containing every variety of tree common to New England are within walking distances of the college. The college campus affords an arboretum containing an exceptionally large number of trees not native to New England. The library contains complete sets of government bulletins, circulars, State reports and all the best books on forestry subjects.

**GEOLOGY.** — A large, well-lighted laboratory for geology, 27 by 50 feet, is in the basement of the new building for entomology, zoölogy and geology. This is equipped with cabinets, models, charts and a teaching collection of rocks. It has a seating capacity of 50 persons. Adjoining this is a smaller laboratory, 21 by 27 feet, for mineralogy, supplied with gas and cabinets for models, crystals and minerals. There is also a small laboratory for grinding thin sections, and a private laboratory, 6 by 19 feet, for analysis work. The geological museum is 27 by 48 feet. It has six large cases for exhibition purposes. The equipment for geology is being enlarged. At present, in addition to the general items mentioned above, it consists of a petrographic microscope, an illustrative series of thin sections, a small collection of invertebrate fossils, some casts of vertebrate fossils, a collection of the building stones of Massachusetts, and a duplicate set of the Edward Hitchcock survey collection of the rocks and minerals of Massachusetts.

**HEATING, LIGHTING AND POWER.** — The college supplies its own light, heat and power, including electricity for the night lighting of the campus and its approaches. The machinery of the barn, the dairy and other buildings is operated by electricity generated at the power-house. The college has also a machine shop and well-equipped carpenter shop.

**LANDSCAPE GARDENING.** — The work in landscape gardening is developed in a strong technical four-year course; the first two years are occupied with required studies, including botany, horticulture, surveying and mathematics, and the last two years are devoted to more specialized studies in landscape

gardening, arboriculture, floriculture, entomology, botany and mathematics. The environment is unusually favorable. The strictly technical work in landscape gardening is taught in light and comfortable drafting rooms, fully furnished with instruments and accessories for thorough work. There is a well-selected library, and the equipment of surveying and drafting instruments is unusually complete and practical.

**LIBRARY.** — The library — stack room, reading room and office — occupies the entire lower floor of the Chapel-library building. It contains nearly 45,000 volumes and a large number of pamphlets, hitherto inaccessible, but which are being put into good working order as fast as possible. Works of a scientific character predominate, but economics, literature and history are well represented and are receiving due attention. The reading room provides a variety of periodical literature, both technical and popular, encyclopedias and general reference books.

The library is now being reclassified and recatalogued, to make the splendid collection of material here gathered together readily accessible and of the greatest working value. Every effort is being made toward developing the library into a vital intellectual center of college life, of equal value to every student, teacher and teaching department. In consequence, only the most cordial relations are cherished, and the fewest and most imperative rules concerning the circulation of books and deportment are enforced.

Lectures are given to regular and short-course students to enable them to make the best use of the library. Emphasis is laid upon the proper use of the card catalogue, periodical indexes, bibliographies and guides; also, in general, assigned and class-room work, and essay and debate work.

The library hours are from 7.30 A.M. to 9.30 P.M. every week day, and from 9 A.M. to 2 P.M. on Sundays, in term time. Shorter hours prevail during vacations.

**MARKET GARDENING.** — The purpose of the courses in market gardening is to acquaint the student with the theories and practice of market gardening so that he will be able to carry on the business intelligently. The equipment available for practical work consists of 10 acres of good gardening land; a large collection of horse and hand garden tools; hot-beds and cold-frames; and lettuce, cucumber and tomato houses. The students therefore have opportunity both to study and to practice the important branches of the business. Classes are taught in French Hall, a new building fitted with class rooms and laboratory particularly equipped for market gardening. A good library of works on vegetable gardening is available.

**MATHEMATICS AND CIVIL ENGINEERING.** — *Surveying.* — The department has a considerable number of the usual surveying instruments, with the use of which the students are required to become familiar by doing field work. Among the larger instruments are 2 plain compasses, a railroad compass with telescope, a surveyor's transit, 3 engineer's transits with vertical arc and level, a Brandis solar transit, a solar compass, an omnimeter with verniers reading to 10 seconds, adapted to geodetic work, a Queen plane table, 3 wye levels, 2 dumpy levels, a builder's level, a sextant, a hand level, and a large assortment of leveling rods, flag poles, chains, tapes, etc. For drafting, a vernier protractor, a pantograph, a parallel rule, etc., are available. The department also has a Fairbanks cement testing outfit.

**MILITARY SCIENCE.** — This department makes use of the campus for battalion drill, and has a special building in which there is a drill room 60

by 135 feet, an armory, an office for the commandant, a field-gun and gallery practice room and a large bathroom. The national government supplies Krag-Jorgensen rifles, with complete equipments and ammunition. The State supplies instruments for the college band. Students are held responsible for all articles of public property in their possession. The college owns an excellent target range for rifle practice, lying a short distance out of the village.

**PHYSICAL EDUCATION.** — The gymnasium and armory has a floor space of 5,000 square feet, and is 30 feet high, well lighted and ventilated. The main floor is used for basket ball, indoor baseball and hand ball. The gallery has been fitted up as a special exercise and gymnastic room, and is equipped with modern developing apparatus, including parallel bars, horses, bucks, chest weights, dumb bells, Indian clubs and striking bags. An outdoor board track enables students to secure track practice through the winter, and two ice hockey rinks give ample opportunity for hockey practice. Credit is given to all students taking part in outdoor activities. "Treks" are held twice a week, and whenever possible snowshoe and skiing hikes are also held. Steel lockers and bathrooms have been installed in North and South colleges, and the gymnasium has been fitted with a shower-room. The gymnasium classes are held the last two hours in the morning and the last two hours in the afternoon, but students may use the gymnasium at other times for exercise purposes by arrangement with the department. The regulation costume for class exercise consists of a white track suit and white rubber-sole shoes.

**PHYSICS.** — Among the apparatus in use for instruction in general physics are a set of United States standard weights and measures, precision balances, a spherometer, vernier calipers, a projection lantern, etc.; in mechanics, a seconds clock, systems of pulleys and levers, and apparatus to illustrate the laws of falling bodies and motion on an inclined plane, and the phenomena connected with the mechanics of liquids and gases. The department is equipped with the usual apparatus for lecture illustration in heat, light and sound; in electricity, the equipment consists of apparatus for both lecture illustration and laboratory work, including a full set of Weston ammeters and volt meters, a Carhart-Clark standard cell, a Mascart quadrant electrometer, a Siemens electro-dynamometer, and reflecting galvanometers and Wheatstone bridges for ordinary determinations of currents and resistances.

**POMOLOGY.** — The department of pomology has 45 acres of orchard, including apple, pear, peach, plum, cherry and quince trees. Of particular interest is the large collection of these fruits on the various dwarf stocks, showing many types of training. The recent revival of interest in dwarf fruits makes these dwarf orchards of especial value to students. There are also two commercial vineyards, and a smaller one in which are shown the principal types of trellis and the leading methods of training grapes. Several acres are used in growing the various kinds of small fruits, such as strawberries, raspberries, blackberries, currants and gooseberries. There are also nurseries, where all of these various types of fruits are grown, in which students may see them in all stages of development.

The department has a good equipment of orchard and nursery tools of all the principal types, the use of which enables students to learn the value of each type. For other orchard operations, such as spraying and pruning, the most approved makes of pumps, nozzles, pruning saws, knives, etc., are provided. For laboratory work in systematic pomology there is a collec-

tion of more than 100 wax models of apples, plums, pears and peaches, in natural colors, which are particularly valuable in identifying varieties of these fruits unknown to the student. The laboratory is also furnished with a large number of reference books on pomology; and fruit in a fresh condition is available in great variety, not only from the college orchards but from other parts of Massachusetts and from many other States. In 1912-13, for instance, apples for class use were received from Idaho, Missouri, Utah, Washington, Maine, Connecticut, Pennsylvania, Montana, Minnesota, Nebraska, Kentucky, Iowa, Wisconsin, Michigan, New York, Kansas, Colorado, Oregon, New Jersey and Vermont, besides collections of grapes from California and citrus fruit from Florida and Texas. From the college fruit plantations the following fruits were available: grapes, fifty varieties, representing three native American species and several hybrids; twenty varieties of peaches, twenty varieties of pears, twenty-five varieties of plums, eighty varieties of apples.

**POULTRY HUSBANDRY.** — The poultry plant consists of about 9 acres of land sloping gently to the west. The soil is a fine, rich, sandy loam, well drained. At present the buildings consist of an incubator cellar, 22 by 34 feet, with a capacity of 4,000 eggs, over which is a demonstration building; a pipe brood house (open-pipe system), 14 by 72 feet, which will accommodate 1,200 chickens; a long laying house, 14 by 180 feet, which accommodates 500 layers and furnishes facilities for student work in pen management; a laboratory, 14 by 80 feet, for killing, picking, dressing, crate fattening, cramming, etc.; a storage building, 28 by 42 feet, for experimental incubation, poultry carpentry, poultry mechanics and storage; an experimental breeding house, 18 by 60 feet; a combination laying, testing and breeding house, 18 by 72, for experimental purposes and a model laying house, 18 by 30, for 100 hens; the 6 old experiment station buildings, each 12 by 18 feet, to be used as breeding houses; 14 colony houses; 8 growing crops; a manure shed, 14 by 18 feet; and an oil house, 10 by 12 feet. Instruction in this department is given in the form of lectures, demonstrations and practical work. The practical work consists of poultry carpentry, caponizing, killing, picking, dressing, packing and selling poultry; pen management and fattening; running incubators and brooders, etc. At present the stock consists of 20 leading varieties of poultry. The aim of the department is to keep good specimens of all the most popular varieties of chicken, ducks and geese, so that a thorough course in poultry judging may be given, and that visitors may find the inspection of our stock an education in itself.

**PUBLIC SPEAKING.** — In connection with the work in public speaking, three regular contests are held during the year. The Burnham contest in declamation is open to freshmen and sophomores; the Flint contest in oratory and the annual debating contest are open (under restrictions) to all regular students. These contests offer a very practical and necessary experience to all students interested in improving themselves in the art of public speaking. Prizes are given for excellence in the contests. Intercollegiate contests are arranged by the Public Speaking Council. One credit is given, except to freshmen, for a year of work in the College Debating Club.

**VETERINARY SCIENCE.** — The department of veterinary science occupies a modern laboratory and hospital stable, built in accordance with the latest principles of sanitation. Every precaution has been taken in the arrangement of details to prevent the spread of disease, and to provide for effective heating, lighting, ventilation and disinfection.

The main building contains a large working laboratory for student use, and several small private laboratories for special work. There is a lecture hall, a museum, a demonstration room, a photographing room and a work shop. The hospital stable contains a pharmacy, an operating hall, a post-mortem and dissecting room, a poultry section, a section for cats and dogs, and 6 sections, separated from each other, for horses, cattle, sheep and swine. The laboratory equipment consists of a dissectible Auzoux model of the horse and Auzoux models of the foot and the leg, showing the anatomy and the diseases of every part. The laboratories also have modern, high-power microscopes, microtomes, incubators and sterilizers, for work in every department of veterinary science including pathology, serology and parasitology. There are skeletons of the horse, the cow, the sheep, the dog and the pig, and a growing collection of anatomical and pathological specimens. The lecture room is provided with numerous maps, charts and diagrams.

**ZOOLOGY.** — The college offers increased facilities for the study of zoölogy. In the new building for entomology, zoölogy and geology are spacious laboratories for both undergraduate and graduate work. On the first floor is a large sophomore laboratory, 27 by 100 feet, with a present seating capacity of 100 persons. Adjoining this is a smaller room, 20 by 27 feet, for junior and senior courses. All laboratories are equipped with gas. The equipment consists of 80 compound microscopes and accessories, 70 dissecting microscopes, microtomes and accessories, paraffine baths, incubator, dissecting instruments, glassware and other necessary apparatus.

The large amphitheater lecture hall is used jointly by the departments of entomology and zoölogy-geology. It is equipped with charts and models. The zoölogical museum is drawn upon at all times for illustrative material. The zoölogical museum is 27 by 48 feet. The main room is on the first floor of the building. Above this, on a level with the second floor, is a large gallery. On the main floor are 8 large wall cases and 5 large floor cases for exhibition purposes. The gallery has 1 large wall case and 3 floor cases with space for 9 additional cases. The zoölogical collection consists of nearly 12,000 specimens. All the chief phyla are represented. Adjoining the museum is a preparator's room for the curator. The museum is open to the public from 1 to 5 P.M. on Saturdays, and on other week days from 3 to 6 P.M. The curator is Associate Professor Gordon.

#### PRIZES AND AWARDS, 1914.

**GRINNELL PRIZES.** — The Grinnell prizes, given by the Hon. William Claflin of Boston in honor of George B. Grinnell, Esq., of New York to those members of the senior class who pass the best, second best, and third best examinations, oral and written, in theoretical and practical agriculture, were awarded as follows: —

First prize, \$25, awarded to Warren Sears Baker.

Second prize, \$15, awarded to William Ashmun Davis.

Third prize, \$10, awarded to Theodore Arthur Nicolet.

**GENERAL IMPROVEMENT.** — The Western Alumni Association prize, given to that member of the sophomore class who during his first two years in college has shown the greatest improvement in scholarship, character and example was \$25. This prize in 1914 was divided equally between Thomas Lincoln Harrocks and Raymond Alson Mooney.

HILLS BOTANICAL PRIZES. — Awarded to the members of the sophomore class for the best and second best herbaria, as follows: —

First prize, \$20, awarded to Kenneth Bradford Laird.

Second prize, \$15, awarded to Thomas Carlton Upham.

PUBLIC SPEAKING. — The Burnham prizes, given to the students delivering the best and second best declamations, were awarded as follows: —

First prize, \$15, awarded to Lincoln David Kelsey, 1917.

Second prize, \$10, awarded to Suran Donald Sherinyan, 1916.

The Flint prizes were awarded to the students delivering the best and second best orations, as follows: —

First prize, \$20, awarded to Frederick William Read, 1914.

Second prize, \$15, awarded to Lincoln David Kelsey, 1917.

MILITARY HONORS. — The following-named cadet officers were reported to the Adjutant-General of the United States army and to the Adjutant-General of the Commonwealth of Massachusetts, as being efficient in military science and tactics and graduating therein with highest honors: —

Col. Stanley Barron Freeborn.

Maj. Harry Dunlap Brown.

Maj. Chester Eaton Wheeler.

Capt. Leone Ernest Smith.

Capt. Nathaniel Kennard Walker.

Capt. Richard Henry Powers.

ENTOMOLOGICAL PRIZE. — A special prize of \$5, offered in 1914 to that member of the junior class presenting the best collections of insects, was awarded to Robert Theodore Frost, 1915.

#### SECRETARIES OF ALUMNI ASSOCIATIONS.

Associate Alumni of the Massachusetts Agricultural College.

*Secretary:* DR. CHARLES A. PETERS, 1897, Amherst, Mass.

Alumni Secretaries' Association of the Massachusetts Agricultural College.

*Secretary:* RALPH J. WATTS, 1907, Amherst, Mass.

Alumni Club of Massachusetts.

*Secretary:* P. W. PICKARD, 1911, 43 Chatham Street, Boston, Mass.

Connecticut Valley Association of the Massachusetts Agricultural College.

*Secretary:* PAUL E. ALGER, 1909, Warehouse Point, Conn.

Massachusetts Agricultural College Club of New York.

*Secretary:* DR. JOHN ASHBURTON CUTTER, 1882, 266 West 77th Street, New York, N. Y.

Massachusetts Agricultural College Club of Washington, D. C.

*Secretary:* DR. WILLIAM A. HOOKER, 1900, U. S. D. A., Office of Experiment Stations, Washington, D. C.

Western Alumni Association of the Massachusetts Agricultural College.

*Secretary:* CHARLES A. TIRRELL, 1906, 4012 Perry Street, Chicago, Ill.

Massachusetts Agricultural College Pacific Coast Alumni Association.

*Secretary:* THOMAS F. HUNT, 1905, Berkeley, Cal.

Massachusetts Agricultural College Club of Hawaii.

*Secretary:* DR. E. A. BACH, 1904, Honolulu, T. H.

*Class Secretaries.*

Class of	SECRETARY.	Secretary's Address.
1871	E. E. Thompson, . . .	5 Jacques Avenue, Worcester, Mass.
1872	F. E. Kimball, . . .	8 John Street, Worcester, Mass.
1873	C. Wellington, . . .	Amherst, Mass.
1874	D. G. Hitchcock, . . .	Warren, Mass.
1875	M. Bunker, . . .	28 Park Street, Newton, Mass.
1876	C. Fred Deuel, . . .	Amherst, Mass.
1877	Atherton Clark, . . .	231 Waverley Avenue, Newton, Mass.
1878	C. O. Lovell, . . .	201 Darke Block, Regina, Saskatchewan, Can.
1879	R. W. Swan, . . .	41 Pleasant Street, Worcester, Mass.
1880	Alvan L. Fowler, . . .	413 Post Office Building, Philadelphia, Pa.
1881	J. L. Hills, . . .	59 North Prospect Street, Burlington, Vt.
1882	G. D. Howe, . . .	25 Winter Street, Bangor, Me.
1883	J. B. Lindsey, . . .	Amherst, Mass.
1884	E. A. Jones, . . .	New Canaan, Conn.
1885	E. W. Allen, . . .	1923 Biltmore Street, Washington, D. C.
1886	Dr. Winfield Ayres, . . .	616 Madison Avenue, New York City.
1887	F. H. Fowler, . . .	Shirley, Mass.
1888	H. C. Bliss, . . .	14 Mechanic Street, Attleborough, Mass.
1889	C. S. Crocker, . . .	1003 South 25th Street, Philadelphia, Pa.
1890	David Barry, . . .	398 Walnut Street, Newtonville, Mass.
1891	H. T. Shores, . . .	177 Elm Street, Northampton, Mass.
1892	H. M. Thomson, . . .	Amherst, Mass.
1893	F. A. Smith, . . .	Hathorne, Mass.
1894	S. F. Howard, . . .	Northfield, Vt.
1895	E. A. White, . . .	Ithaca, N. Y.
1896	A. S. Kinney, . . .	South Hadley, Mass.
1897	C. A. Peters, . . .	Amherst, Mass.
1898	W. S. Fisher, . . .	Peace Street Grammar School, Providence, R. I.
1899	D. A. Beaman, . . .	Rio Piedras, Porto Rico.
1900	E. K. Atkins, . . .	15 Hubbard Avenue, Northampton, Mass.
1901	J. H. Chickering, . . .	Dover, Mass.
1902	H. L. Knight, . . .	1420 Buchanan Street, Washington, D. C.
1903	G. D. Jones, . . .	North Amherst, Mass.
1904	P. F. Staples, . . .	Sherborn, Mass.
1905	A. D. Taylor, . . .	1900 Euclid Avenue, Cleveland, O.
1906	Richard Wellington, . . .	St. Anthony Park, Minnesota.
1907	Clinton King, . . .	31 Elm Street, Springfield, Mass.
1908	J. A. Hyslop, . . .	860 North Mulberry Street, Hagerstown, Md.
1909	O. B. Briggs, . . .	1015 Fidelity Building, Baltimore, Md.
1910	F. L. Thomas, . . .	R. F. D. No. 2, Athol, Mass.
1911	L. M. Johnson, . . .	Newtown, Conn.
1912	F. S. Madison, . . .	East Greenwich, R. I.
1913	B. W. Ellis, . . .	Amherst, Mass.
1914	L. Ernest Smith, . . .	Colchester, Conn.





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DEGREES CONFERRED AND  
ROLL OF STUDENTS.

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## DEGREES CONFERRED—1914.

### DOCTOR OF PHILOSOPHY.

Merrill, Joseph Henry, Danvers, Mass., Dartmouth, B.Sc., 1909.  
 Smulyan, Marcus Thomas, Amherst, Mass., Massachusetts Agricultural College, B.Sc., 1909.  
 Thomas, Frank Lincoln, Athol, Mass., Massachusetts Agricultural College, B.Sc., 1910.

### MASTER OF SCIENCE.

Ackerman, Arthur John, Worcester, Mass., Massachusetts Agricultural College, B.Sc., 1912.  
 Fowler, George Scott, Wayland, Mass., Massachusetts Agricultural College, B.Sc., 1912.  
 Hutson, John Coghlan, Bridgetown, Barbados, Oxford University, B.A., 1909.  
 Martin, James Francis, Amherst, Mass., Massachusetts Agricultural College, B.Sc., 1912.  
 Noyes, Harry Alfred, Lafayette, Ind., Massachusetts Agricultural College, B.Sc., 1912.  
 Parker, Ralph Robinson, Penikese, Mass., Massachusetts Agricultural College, B.Sc., 1912.  
 Ruprecht, Rudolf William, Brooklyn, N. Y., Rhode Island Agricultural College, B.Sc., 1911.  
 Tower, Daniel Gordon, Roxbury, Mass., Massachusetts Agricultural College, B.Sc., 1912.

### BACHELOR OF SCIENCE (B.Sc.).

Abbott, Leslie Elmer, . . . . .	Sandwich.
Allen, Carl Murdough, . . . . .	Holyoke.
Baker, Warren Sears, . . . . .	Wollaston.
Black, Harold Cotting, . . . . .	Falmouth.
Bokelund, Chester Story, . . . . .	Worcester.
Bradley, John Watling, . . . . .	Groton.
Bragg, Ralph Stanley, . . . . .	Milford.
Brewer, Harold William, . . . . .	Mount Vernon, N. Y.
Brooks, Arthur Winslow, . . . . .	Smiths.
Brown, Harry Dunlap, . . . . .	Lowell.
Calvert, Melville Bradford, . . . . .	New London, Conn.
Campbell, Malcolm David, . . . . .	Still River.
Christie, Edward Wheeler, . . . . .	North Adams.
Churchill, George Clarence, . . . . .	Worcester.
Clark, Ernest Samuel, Jr., . . . . .	Tolland.
Clay, Harold Johnson, . . . . .	Cambridge.
Clegg, Frank Jackson, . . . . .	Fall River.
Coleman, David Augustus, . . . . .	South Framingham.
Davies, Lloyd Garrison, . . . . .	Peabody.
Davis, Ralph Edward, . . . . .	Southbury, Conn.
Davis, William Ashmun, . . . . .	Northfield.
Dearing, Newton Howard, . . . . .	Brookline.
Dexter, Evans King, . . . . .	Mattapoisett.
Dunbar, Erving Walker, . . . . .	North Weymouth.
Edgerton, Almon Morley, . . . . .	Mittineague.
Edwards, Edward Clinton, . . . . .	North Beverly.
Eldridge, Harold Lockwood, . . . . .	Wareham.
Foster, Stuart Brooks, . . . . .	West Somerville.
Freeborn, Stanley Barron, . . . . .	Ware.
Freedman, Samuel Leavitt, . . . . .	Roxbury.
Frye, Carl Raymond, . . . . .	South Hadley Falls.
Fuller, George, . . . . .	Deerfield.
Hadfield, Harold Frederick, . . . . .	North Adams.
Handy, Ralph Ellis, . . . . .	Cataumet.

Harris, Rodney Wells, . . . . .	Wethersfield, Conn.
Hazen, Edward Leonard, . . . . .	Springfield.
Hebard, Emory Blodgett, . . . . .	Holland.
Heffron, Frederick, . . . . .	Sherborn.
Hill, Charles Chase, . . . . .	Melrose Highlands.
Hogg, Lawrence Jagger, . . . . .	Lawrence.
Howard, Lewis Phillips, . . . . .	North Easton.
Hutchinson, John Gouverneur, . . . . .	Arlington.
Ingham, Earl Morris, . . . . .	Granby.
Jacobs, Loring Humphrey, . . . . .	Wellesley.
Jones, Dettmar Wentworth, . . . . .	Melrose.
Leete, Richard Fowler, . . . . .	Mount Kisco, N. Y.
Levine, Henry Walter, . . . . .	Roxbury.
Lincoln, Murray Danforth, . . . . .	Raynham.
Lucas, Hoyt Dennis, . . . . .	Springfield.
Lundgren, Arthur Robert, . . . . .	Orange.
Major, Joseph, . . . . .	East Rutherford, N. J.
Marsh, Frank Eugene, . . . . .	Jefferson.
Merkle, Frederick Grover, . . . . .	Amherst.
Morrison, Harold Ivory, . . . . .	Melrose.
Morse, Harold John, . . . . .	Townsend.
Needham, Lester Ward, . . . . .	Springfield.
Nicolet, Theodore Arthur, . . . . .	Fall River.
Nicolet, Tell William, . . . . .	Fall River.
Nissen, Harry, . . . . .	Boston.
Norton, Leslie Howard, . . . . .	Newport, R. I.
Nute, Raymond Edson, . . . . .	Fall River.
O'Brien, Daniel William, . . . . .	Wayland.
Oertel, John Thomas, . . . . .	South Hadley Falls.
Parker, Ervine Franklin, . . . . .	Poquonock, Conn.
Payne, Roland Alfred, . . . . .	Wakefield.
Pellett, John Doubleday, . . . . .	Worcester.
Peters, Chester Harry, . . . . .	Clinton.
Petersen, Peveril Oscar, . . . . .	Concord.
Porter, Bennett Allen, . . . . .	Amherst.
Powers, Richard Henry, . . . . .	Malden.
Read, Frederick William, . . . . .	Boston.
Reid, George Alexander, . . . . .	Worcester.
Rosebrooks, Walter Edwin, . . . . .	West Sutton.
Russell, Alden Hesseltine, . . . . .	Watertown.
Sahr, Gabriel William Arthur, . . . . .	Boston.
Sherman, Joel Powers, . . . . .	Hyannis.
Small, Francis Willard, . . . . .	North Truro.
Smith, Leon Edgar, . . . . .	Boston.
Smith, Leone Ernest, . . . . .	Leominster.
Stevens, Arthur Eben, . . . . .	Lawrence.
Strange, Sarah Josephine, . . . . .	Marshfield.
Tarbell, Munroe Gifford, . . . . .	Brimfield.
Taylor, Arthur Wright, . . . . .	Feeding Hills.
Taylor, Leland Hart, . . . . .	Peabody.
Thurston, Arthur Searle, . . . . .	Everett.
Tower, Alfred Leigh, . . . . .	Sheffield.
Tupper, Arthur Sommerville, . . . . .	Roxbury.
Upton, Ernest Franklin, . . . . .	Salem.
Walker, Nathaniel Kennard, . . . . .	Malden.
Walker, Raymond Philip, . . . . .	Taunton.
Warner, Raymond Winslow, . . . . .	Sunderland.
Webster, Louis Armstrong, . . . . .	Blackstone.
Weigel, Arthur George, . . . . .	Lawrence.
Wheeler, Chester Eaton, . . . . .	Lowell.
Whidden, Burton Clark, . . . . .	Lowell.
Whippen, Charles Warren, . . . . .	Lynn.
Wing, John Govan, . . . . .	Somerville.
Wood, Henry Joseph, . . . . .	Mendon.

## ROLL OF STUDENTS.

### GRADUATE STUDENTS — CANDIDATES FOR A DEGREE.

Anderson, David Wadsworth, . . . . .	Manchester, N. H.
B.Sc., New Hampshire State College.	
Avery, Roy Crowdy, . . . . .	New York, N. Y.
B.Sc., Connecticut Agricultural College.	
Baird, Charles Glenn, . . . . .	Powell, Wyoming.
A.B., University of Kansas; A.M., University of Wyoming.	
Baker, Herbert J., . . . . .	Selbyville, Del.
B.Sc., Massachusetts Agricultural College.	
Bales, Harold C., . . . . .	North Amherst.
A.B., Dartmouth.	
Beals, Carlos Loring, . . . . .	Sunderland.
B.Sc., Massachusetts Agricultural College.	
Bogue, Robert H., . . . . .	North Amherst.
B.Sc., Tufts.	
Bourne, Arthur Israel, . . . . .	Kensington, N. H.
A.B., Dartmouth.	
Bronson, Wesley Hotchkiss, . . . . .	Marlborough.
B.Sc., New York State College of Agriculture.	
Brown, Henry L., . . . . .	Ayer.
B.Sc., University of Maine.	
Chapman, George H., . . . . .	Amherst.
B.S. and M.S., Massachusetts Agricultural College.	
Copson, Godfrey Vernon, . . . . .	Grand Rapids, Mich.
B.Sc. in agriculture, Oregon Agricultural College.	
Davies, Ernest Langford, . . . . .	Guelph, Can.
B.Sc., Ontario Agricultural College.	
Foster, Leo T., . . . . .	Leominster.
A.B., Holy Cross College.	
Frost, Walter S., . . . . .	Roxbury.
B.S. in chemistry, Tufts College.	
Gurley, Franklin Cornell, . . . . .	South Willington,
B.Sc., Worcester Polytechnic Institute.	
Conn.	
Hasey, Willard Harrison, . . . . .	Brockton.
B.Sc., Massachusetts Agricultural College.	
Hillary, Walter Hoxie, . . . . .	Philadelphia, Pa.
B.Sc., Pennsylvania State College.	
Holland, Edward Bertram, . . . . .	Amherst.
M.Sc., Massachusetts Agricultural College.	
Hood, Egerton Gibson, . . . . .	Hagermon, Ontario,
Can.	
Hutson, John Coghlan, . . . . .	Bridgetown, Barbados.
A.B., Trinity College, Oxford, Eng.; M.Sc., Massachusetts Agricultural College.	
Itano, Arao, . . . . .	Okayamaken, Japan.
B.Sc., Michigan Agricultural College.	
Lund, Russell Fort, . . . . .	West Pelham.
B.A., St. Lawrence University.	

Martin, James Francis,	Amherst.
M.Sc., Massachusetts Agricultural College.	
McDougall, Allister F.,	Westford.
B.Sc., Massachusetts Agricultural College.	
McLaughlin, Frederick Adams,	Lee
B.Sc., Massachusetts Agricultural College.	
Merkle, Frederick Grover,	Amherst.
B.Sc., Massachusetts Agricultural College.	
Miller, Stuart Parmelee,	East Hampton, Conn.
B.Sc., Worcester Polytechnic Institute.	
Mutkekar, Satwaji Gundoji,	Belgaum, India.
B.Agr., Poona Agricultural College, India.	
Norton, John Buck,	Hartford, N. Y.
B.Sc., University of Vermont.	
Oberhelman, Carl F.,	Norwood, O.
B.Sc. in agriculture, Ohio State University.	
Paige, Beryl Holmes,	Amherst.
A.B., Mount Holyoke College.	
Parker, Ralph Robinson,	Penikese.
B.Sc. and M.Sc., Massachusetts Agricultural College.	
Porter, Bennet Allen,	Amherst.
B.Sc., Massachusetts Agricultural College.	
Regan, William Swift,	Northampton.
B.Sc., Massachusetts Agricultural College.	
Robinson, Harold A.,	Elmwood, N. H.
B.Sc., New Hampshire State College.	
Root, George Albert,	Danbury, Conn.
B.Sc., Connecticut Agricultural College.	
Sanctuary, William Crocker,	Morrisville, N. Y.
B.Sc., Massachusetts Agricultural College.	
Serex, Paul, Jr.,	Bloomfield, N. J.
B.Sc., Massachusetts Agricultural College.	
Smith, Raymond Goodale,	Lynn.
B.Sc., Massachusetts Agricultural College.	
Strand, Carl J.,	Amherst.
A.B., Augustana College; M.A., University of Illinois.	
Taylor, Leland H.,	Peabody.
B.Sc., Massachusetts Agricultural College.	
Thurston, Arthur S.,	Everett.
B.Sc., Massachusetts Agricultural College.	
Wang, Iu Tso,	Canton, China.
B.Sc., Cornell University.	
White, Edward Albert,	Ithaca, N. Y.
B.Sc., Massachusetts Agricultural College.	
Whittier, Warren Faxon,	Amherst.
A.B., Harvard University.	

## GRADUATE STUDENTS — NOT CANDIDATES FOR A DEGREE.

Cowell, Harold Cobb,	Ashburnham.
A.B., Williams College.	
Farrar, Marion A.,	South Framingham.
A.B., Boston University.	
Hooker, Elizabeth Robbins,	Dorchester.
A.B., Radcliffe College.	
Martindale, Henrietta,	La Crosse, Wis.
A.B., Smith College.	
Middleton, Frederick Heard,	Brookline.
A.B., Harvard University.	
White, Gertrude Moody,	Hartford, Conn.
A.B., Vassar.	

## SENIOR CLASS.

Alden, Charles Harold, . . . . .	Amherst, . . . . .	17 Phillips Street.
Allen, Francis Ellwood, . . . . .	Melrose, . . . . .	3 North College.
Archibald, Herbert Hildreth, . . . . .	Waltham, . . . . .	14 South College.
Banister, Seth Warren, . . . . .	Westford, . . . . .	16 North College.
Bartlett, Edward Russell, . . . . .	Newburyport, . . . . .	3 Nutting Avenue.
Bartley, Hastings Newcomb, . . . . .	Sandwich, . . . . .	9 South College.
Bemis, Willard Gilbert, . . . . .	North Brookfield, . . . . .	Commons Club.
Bennett, John Ingram, <sup>1</sup> . . . . .	Boston, . . . . .	66 Pleasant Street.
Bishop, Chester Allen, . . . . .	Peterboro, N. H., . . . . .	7 North College.
Brooks, Gardner Milton, . . . . .	Boston, . . . . .	Box 31, M. A. C.
Buell, Frank Weed, . . . . .	New Haven, Conn., . . . . .	5 South College.
Burt, Helen Frances, . . . . .	West Somerville, . . . . .	Draper Hall.
Buttrick, John Willard, . . . . .	Melrose, . . . . .	18 Nutting Avenue.
Cale, Gladstone Hume, . . . . .	Springfield, . . . . .	90 Pleasant Street.
Cande, Donald Hopkins, . . . . .	Pittsfield, . . . . .	87 Pleasant Street.
Chase, Alexander Baxter, Jr., . . . . .	West Barnstable, . . . . .	Clark Hall.
Clark, Ellis Fred, . . . . .	Granby, Conn., . . . . .	3 South College.
Cleveland, Waldo Atwood, <sup>1</sup> . . . . .	Baldwinsville, . . . . .	Veterinary Laboratory.
Clough, Maurice Joseph, . . . . .	Boston, . . . . .	7 South College.
Dalrymple, Andrew Campbell, . . . . .	Revere, . . . . .	2 North College.
Damon, Leon Blanchard, . . . . .	Melrose, . . . . .	3 North College.
Day, George Allen, . . . . .	Warren, . . . . .	1 North College.
Dole, Sumner Alvord, . . . . .	Shelburne, . . . . .	11 North College.
Doran, William Leonard, . . . . .	North Dartmouth, . . . . .	French Hall.
Draper, Earle Sumner, . . . . .	Milford, . . . . .	15 South College.
Farrar, Stuart Kittridge, <sup>1</sup> . . . . .	Springfield, . . . . .	96 Pleasant Street.
Fitzgerald, Daniel James, . . . . .	Worcester, . . . . .	2 North College.
Flebut, Alpha John, . . . . .	Amherst, . . . . .	27 McClellan Street.
Frost, Robert Theodore, . . . . .	New York, N. Y., . . . . .	85 Pleasant Street.
Fuller, Richard, <sup>1</sup> . . . . .	Salem, . . . . .	44 Triangle Street.
Goodwin, Malcolm Noyes, . . . . .	Newburyport, . . . . .	96 Pleasant Street.
Grant, Harold Davidson, . . . . .	Methuen, . . . . .	15 North College.
Griggs, Raymond Bradford, <sup>1</sup> . . . . .	Chicopee Falls, . . . . .	11 South College.
Hall, George Morris, <sup>1</sup> . . . . .	Brookline, . . . . .	85 Pleasant Street.
Hall, Roderick Chesley, <sup>1</sup> . . . . .	Worcester, . . . . .	Beta Kappa Phi.
Harper, James Edward, <sup>1</sup> . . . . .	New Haven, Conn., . . . . .	2 North College.
Harvey, Russell Wilton, . . . . .	Lanesville, . . . . .	44 Pleasant Street.
Haskell, Willis Henry, Jr., . . . . .	Brooklyn, N. Y., . . . . .	116 Pleasant Street.
Hatfield, William Hollis, . . . . .	Wellesley, . . . . .	87 Pleasant Street.
Hildreth, Paul Hughes, . . . . .	Newtonville, . . . . .	13 South College.
Hotis, Ralph P., . . . . .	Evans Mills, N. Y., . . . . .	21 Amity Street.
Hyde, George Frederick, . . . . .	Hartford, Conn., . . . . .	Beta Kappa Phi.
Hyde, Harold Gilmore, . . . . .	Winchendon, . . . . .	12 North College.
Johnson, Arthur, . . . . .	Bridgeport, Conn., . . . . .	7 South College.
Kelleher, Jerome Joseph, . . . . .	Turners Falls, . . . . .	5 East Pleasant Street.
Kennedy, Worthington Chester, . . . . .	Hardwick, . . . . .	6 North College.
Lane, Merton Chesleigh, . . . . .	South Duxbury, . . . . .	Mathematics Building.
Le Duc, Ashley Cudworth, . . . . .	Chesterfield, . . . . .	Commons Club.
Lewis, Daniel James, . . . . .	Hanson, . . . . .	96 Pleasant Street.
Lewis, John Kirby, . . . . .	New Haven, Conn., . . . . .	1 North College.
Lincoln, Irving Boim, . . . . .	Glens Falls, N. Y., . . . . .	2 South College.
Lovejoy, John Sumner, <sup>1</sup> . . . . .	Newburyport, . . . . .	9 North College.
MacNeil, Ralph Langdel, <sup>1</sup> . . . . .	Chelsea, . . . . .	Mathematics Building.
Macy, Philip Arthur, . . . . .	Oak Bluffs, . . . . .	10 North College.
Marsh, Franklin Winter, . . . . .	Amherst, . . . . .	18 Nutting Avenue.
Marsh, Herbert Vener, . . . . .	Deerfield, . . . . .	4 South College.
Massé, Sidney Merton, . . . . .	Dorchester, . . . . .	3 South College.
McKechnie, Ray Farrar, . . . . .	Natick, . . . . .	11 Pleasant Street.
McLain, Ralph Emerson, . . . . .	Melrose, . . . . .	20 South College.

<sup>1</sup> Work incomplete.

Melican George Deady, . . . .	Worcester, . . . .	8 South College.
Moberg, Eldon Samuel, . . . .	Campello, . . . .	83 Pleasant Street.
Montague, Enos James, . . . .	Northampton, . . . .	3 South College.
Moore, Roger Henry, . . . .	Beverly, . . . .	15 North College.
Navas, Miguel, <sup>1</sup> . . . .	Barranquilla, Col., South America.	6 Phillips Street.
Parker, Edwin Kenney, . . . .	Northampton, . . . .	8 Allen Street.
Parmenter, Ernest Brigham, . . . .	Franklin, . . . .	13 North College.
Patterson, Robert Earley, . . . .	Dorchester, . . . .	14 North College.
Pease, Willard Noah Morris, <sup>1</sup>	Amherst, . . . .	Brooks Farm.
Pendleton, Harlow Libby, <sup>1</sup> . . . .	Dorchester, . . . .	Flint Laboratory.
Perry, Gerald Eugene, . . . .	Amherst, . . . .	Prospect House.
Pike, Joseph Stevens, Jr., <sup>1</sup> . . . .	Somerville, . . . .	8 North College.
Potter, George Raymond, . . . .	Ludlow, . . . .	44 Pleasant Street.
Price, James Albert, . . . .	New York, N. Y., . . . .	14 South College.
Rhoades, Paul Whitney, <sup>1</sup> . . . .	Malden, . . . .	4 North College.
Rogers, Harold Merriman, . . . .	Southington, Conn., . . . .	87 Pleasant Street.
Sauchelli, Vincent, . . . .	Waterbury, Conn., . . . .	6 Maple Street.
Sears, William Richard, . . . .	Woburn, . . . .	10 South College.
Severance, Verne Lincoln, . . . .	South Hanson, . . . .	Mathematics Building.
Sherman, Milton Francis, . . . .	South Lincoln, . . . .	10 Allen Street.
Simon, Isaac Barney, . . . .	Revere, . . . .	38 Cottage Street.
Slein, Owen Francis, . . . .	New Braintree, . . . .	12 North College.
Smith, Hyde, . . . .	Worcester, . . . .	1 South College.
Spicer, Eber Grant, . . . .	New York, N. Y., . . . .	44 Triangle Street.
Spofford, Chester Porter, <sup>1</sup> . . . .	South Groveland, . . . .	6 North College.
Stanford, Ernest Elwood, . . . .	Amherst, . . . .	4 Walnut Street.
Taft, Richard Craig, <sup>1</sup> . . . .	Oxford, . . . .	88 Pleasant Street.
Tarr, Lester Winslow, . . . .	Rockport, . . . .	90 Pleasant Street.
Tower, Ralph Ernest, . . . .	Becket, . . . .	College Commons.
Tower, William Reginald, . . . .	Sheffield, . . . .	Mount Pleasant.
Towne, Edwin Chester, . . . .	Waltham, . . . .	7 North College.
Upton, Raymond Melville, . . . .	Peabody, . . . .	Durfee Plant House.
Vener, Benjamin, . . . .	Brockton, . . . .	1 South College.
Vinal, Stuart Cunningham, . . . .	Boston, . . . .	10 North College.
Wellington, Benjamin, . . . .	Waltham, . . . .	15 Phillips Street.
White, Henry Harrison, . . . .	West Peabody, . . . .	4 South College.
White, Homer Beethoven, <sup>1</sup> . . . .	Melrose Highlands, . . . .	15 Phillips Street.
Whitmore, Philip Ferry, . . . .	Sunderland, . . . .	88 Pleasant Street.
Whorf, Paul Francis, . . . .	Caribou, Me., . . . .	4 South College.
Wilkins, Alfred Emerson, <sup>1</sup> . . . .	Wakefield, . . . .	2 South College.
Wiley, Harold Cleland Clancey, . . . .	Orange, . . . .	M. A. C. Plant House.
Williams, Donald, <sup>1</sup> . . . .	Catasauqua, Pa., . . . .	85 Pleasant Street.
Wright, Elvin Stanley, . . . .	Worcester, . . . .	88 Pleasant Street.
Zehrunge, Samuel Danford, <sup>1</sup> . . . .	Roseville, O., . . . .	81 Pleasant Street.

## JUNIOR CLASS.

Aiken, Harold, <sup>1</sup> . . . .	Millis, . . . .	82 Pleasant Street.
Anderson, Frank Albert, <sup>1</sup> . . . .	Somerville, . . . .	12 South College.
Andrews, Francis Marshall, Jr., <sup>1</sup>	Manchester, . . . .	53 Lincoln Avenue.
Barnes, Dwight Fletcher, . . . .	Marshfield, . . . .	Entomology Building.
Barnes, Fred Leslie Walker, <sup>1</sup> . . . .	Plymouth, . . . .	90 Pleasant Street.
Bishop, Herbert Walker, <sup>1</sup> . . . .	Doylestown, Pa., . . . .	85 Pleasant Street.
Blanpied, Nelson Uhler, . . . .	Framingham, . . . .	M. A. C. Farm House.
Boyer, Edward Everett Hale, <sup>1</sup> . . . .	Lynn, . . . .	30 North Prospect Street.
Brazil, William Henry, <sup>1</sup> . . . .	Leominster, . . . .	116 Pleasant Street.
Bronson, Harold Julian, <sup>1</sup> . . . .	Buckland, . . . .	Fitts' House.
Caldwell, Harold Nute, <sup>1</sup> . . . .	Lowell, . . . .	M. A. C. Farm House.
Cardarelli, Emilio Joseph, . . . .	Boston, . . . .	West Experiment Station.
Chase, Esther Helen, <sup>1</sup> . . . .	Holden, . . . .	Draper Hall.
Chisholm, Raymond Lincoln, . . . .	Melrose Highlands, . . . .	66 Pleasant Street.

<sup>1</sup> Work incomplete.



Clapp, Raymond Luckey, . . . . .	Northfield, . . . . .	Care of E. F. Gaskill.
Clark, Saxon Dickinson, <sup>1</sup> . . . . .	Springfield, . . . . .	Commons Club.
Coe, Alfred Lynn, . . . . .	Fayetteville, N. Y., . . . . .	90 Pleasant Street.
Coleman, Albert Sumner, <sup>1</sup> . . . . .	Mendon, . . . . .	6 Maple Avenue.
Coley, William Stanton, . . . . .	Wilton, Conn., . . . . .	87 Pleasant Street.
Courchene, Alcide Telesphor, <sup>1</sup> . . . . .	North Adams, . . . . .	Kappa Gamma Phi.
Curran, Harry Ambrose, . . . . .	Marlborough, . . . . .	Kappa Gamma Phi.
Cushing, Raymond Alonzo, <sup>1</sup> . . . . .	West Somerville, . . . . .	13 Phillips Street.
Danforth, George Newlin, <sup>1</sup> . . . . .	Foxcroft, Me., . . . . .	96 Pleasant Street.
Darling, Homer Chester, . . . . .	Mendon, . . . . .	5 South College.
Davis, Frank Leslie, <sup>1</sup> . . . . .	Hopedale, . . . . .	North Pleasant Street.
Dickinson, William Cows, . . . . .	North Amherst, . . . . .	North Amherst.
Dodge, Walter Eugene, . . . . .	Geneva, O., . . . . .	13 Phillips Street.
Eldredge, Raymond Chase, . . . . .	North Abington, . . . . .	Mount Pleasant.
Estes, Ralph Cary, <sup>1</sup> . . . . .	South Framingham, . . . . .	Care of Professor Morton.
Fernald, Charles Henry, 2d, . . . . .	Amherst, . . . . .	44 Amity Street.
Fielding, Lester Edward, . . . . .	Malden, . . . . .	96 Pleasant Street.
Fisher, George Basil, <sup>1</sup> . . . . .	Millbury, . . . . .	88 Pleasant Street.
Gaventa, Harry Reymier, . . . . .	Swedesboro, N. J., . . . . .	Commons Club.
Gilmore, Benjamin Anthony, <sup>1</sup> . . . . .	Acushnet, . . . . .	90 Pleasant Street.
Gioiosa, Alfred Anthony, . . . . .	Dorchester, . . . . .	16 South College.
Glover, Theodore Whitford, <sup>1</sup> . . . . .	South Duxbury, . . . . .	R. F. D. No. 3, Box 79.
Goodwin, Clinton Foster, <sup>1</sup> . . . . .	Haverhill, . . . . .	82 Pleasant Street.
Googins, Burton, <sup>1</sup> . . . . .	Amherst, . . . . .	35 East Pleasant Street.
Gould, Charles Holt, . . . . .	Worcester, . . . . .	88 Pleasant Street.
Gunn, Carlton Merrick, . . . . .	Sunderland, . . . . .	90 Pleasant Street.
Hager, Clayton Marden, . . . . .	Winter Hill, . . . . .	M. A. C. Store.
Hall, Stanley William, . . . . .	Saxonville, . . . . .	96 Pleasant Street.
Harris, William Lombard, Jr., <sup>1</sup> . . . . .	Deerfield, . . . . .	90 Pleasant Street.
Harrocks, Thomas Lincoln, . . . . .	Westminster, . . . . .	87 Pleasant Street.
Hart, Reginald, <sup>1</sup> . . . . .	Montague City, . . . . .	10 North College.
Haskell, Frank Eugene, . . . . .	Northborough, . . . . .	82 Pleasant Street.
Hathaway, Charles Edward, Jr., <sup>1</sup> . . . . .	Somerset, . . . . .	87 Pleasant Street.
Hemenway, Justin Stanley, <sup>1</sup> . . . . .	Williamsburg, . . . . .	37 East Pleasant Street.
Hendry, Arthur Ekman, <sup>1</sup> . . . . .	Mattapan, . . . . .	18 Nutting Avenue.
Hicks, Albert James, <sup>1</sup> . . . . .	Amherst, . . . . .	East Experiment Station.
Holden, Mae Faustina, . . . . .	Royalston, . . . . .	Care of Professor Hasbrouck.
Hunt, Reginald Stuart, <sup>1</sup> . . . . .	Newtonville, . . . . .	Commons Club.
Huntington, Charles Albert, Jr., . . . . .	Poquonock, Conn., . . . . .	96 Pleasant Street.
Jerome, Frederick William, <sup>1</sup> . . . . .	Stockbridge, . . . . .	Prospect Street.
Jones, Linus Hale, <sup>1</sup> . . . . .	Milford, . . . . .	Care of Mr. Green, Mount Pleasant.
Jordan, Perley Black, <sup>1</sup> . . . . .	Topsfield, . . . . .	13 South College.
Kelly, Harold Russell, <sup>1</sup> . . . . .	Haverhill, . . . . .	Pease Avenue.
Kilbon, Ralph Gillette, <sup>1</sup> . . . . .	Springfield, . . . . .	Brooks Farm.
King, Edward Lee, <sup>1</sup> . . . . .	Dorchester, . . . . .	6 South College.
Knapton, Guy Lord, . . . . .	Lawrence, . . . . .	Pease Avenue.
Laird, Kenneth Bradford, . . . . .	Whitman, . . . . .	79 Pleasant Street.
Lieber, Conrad Hugo, . . . . .	Jamaica Plain, . . . . .	Kappa Gamma Phi.
Lindquist, Albert Evert, . . . . .	Jamaica Plain, . . . . .	Physics Building.
Little, Harold Greenleaf, <sup>1</sup> . . . . .	Newburyport, . . . . .	96 Pleasant Street.
Locke, Wilber Trow, . . . . .	Lawrence, . . . . .	85 Pleasant Street.
Lyford, Waldo Preston, <sup>1</sup> . . . . .	Natick, . . . . .	13 South Prospect Street.
Mahan, Harold Butterworth, <sup>1</sup> . . . . .	Boston, . . . . .	Kappa Gamma Phi.
Mahony, William John, <sup>1</sup> . . . . .	Sterling, . . . . .	6 South College.
Mattoon, Harold Gleason, . . . . .	Pittsfield, . . . . .	87 Pleasant Street.
Mooney, Raymond Alson, <sup>1</sup> . . . . .	Plattsburgh, N. Y., . . . . .	85 Pleasant Street.
Moses, Charles Wicker, . . . . .	Ticonderoga, N. Y., . . . . .	9 North College.
Mostrom, Harold Augustus, . . . . .	North Middleborough, . . . . .	10 Nutting Avenue.
Murphy, John William, . . . . .	Beverly, . . . . .	66 Pleasant Street.
Nash, Clayton Wells, . . . . .	South Weymouth, . . . . .	Commons Club.
Nicholson, James Thomas, <sup>1</sup> . . . . .	Leominster, . . . . .	116 Pleasant Street.

<sup>1</sup> Work incomplete.

O'Brion, Edwin Fulton, <sup>1</sup>	Somerville,	Commons Club.
Palmer, George Bradford,	Brookline,	96 Pleasant Street.
Perry, Edgar Adams, <sup>1</sup>	Attleborough,	21 Amity Street.
Plaisted, Philip Asbury,	Arlington,	15 Beston Street.
Potter, David,	Concord,	9 South College.
Prouty, Stanley Marshall,	North Brookfield,	96 Pleasant Street.
Ray, George Burrill, <sup>1</sup>	Hingham,	Kappa Gamma Phi.
Rich, Gilbert Warren, <sup>1</sup>	Hingham,	Care of Professor Morton.
Richards, Everett Stackpole,	Northampton,	96 Pleasant Street.
Ricker, Dean Albert,	Worcester,	7 North College.
Rogers, Tyler Stewart,	Saxonville,	12 South College.
Rowe, Louis Victor, <sup>1</sup>	Melrose,	90 Pleasant Street.
Russell, Ernest Samuel,	South Hadley,	96 Pleasant Street.
Ryan, William Edward, Jr., <sup>1</sup>	Stoughton,	5 Sunset Avenue.
Sander, Benjamin Charles Louis, <sup>1</sup>	Cambridge,	College Store.
Sanderson, Everett Shelvon,	Centreville, R. I.,	10 Nutting Avenue.
Scheufele, Frank Joseph,	South Natick,	15 Beston Street.
Schlotterbeck, Lewis, <sup>1</sup>	Roxbury Station, Conn.,	85 Pleasant Street.
Selkregg, Edwin Reimund, <sup>1</sup>	North East, Pa.,	81 Pleasant Street.
Sherinyan, Donald, <sup>1</sup>	Worcester,	35 North Prospect Street.
Simmons, Perez,	Pittsfield,	82 Pleasant Street.
Stearns, Frederick Campbell, <sup>1</sup>	Waltham,	30 Prospect Street.
Strauss, Abraham,	Roxbury,	Clark Hall.
Swan, Durelle,	Dorchester,	18 Nutting Avenue.
Taber, Ralph Fred,	Cooperstown, N. Y.,	Mount Pleasant.
Topham, Alfred,	Lawrence,	116 Pleasant Street.
Upham, Thomas Carlton, <sup>1</sup>	Fitchburg,	53 Lincoln Avenue.
Verbeck, Howard Graves,	Malden,	12 South College.
Walkden, Herbert Halden,	Westford,	Kappa Gamma Phi.
Walker, Henry Marshall,	Brookline,	Kappa Gamma Phi.
Wentworth, Everett Lawrence,	East Dover, Vt.,	30 North Prospect Street.
Wetherbee, Raymond Swift,	Waltham,	90 Pleasant Street.
White, Samuel Alexander, <sup>1</sup>	Boston,	38 College Street.
Whitney, Harold Tichenor, <sup>1</sup>	Mount Vernon, N. Y.,	8 North College.
Whitney, Leon Fradley,	Brooklyn, N. Y.,	96 Pleasant Street.
Wies, Calmy,	Malden,	38 Cottage Street.
Wildon, Garrick Earl,	Melrose Highlands,	68 Pleasant Street.
Woolley, Harold Curtis,	Malden,	96 Pleasant Street.

## SOPHOMORE CLASS.

Adams, Henry Leo <sup>1</sup>	Newburyport,	3 Nutting Avenue.
Alcott, William Jefferson, <sup>1</sup>	Everett,	90 Pleasant Street.
Aloe, Myron, <sup>1</sup>	Philadelphia, Pa.,	73 Pleasant Street.
Babbitt, George King, <sup>1</sup>	Boston,	Care of Professor Morton.
Babcock, Philip Rodney, <sup>1</sup>	Lynn,	96 Pleasant Street.
Barnes, Herbert Wesley,	Whitinsville,	Commons Club.
Behrend, Oswald,	Natick,	Commons Club.
Bell, Alfred Whitney, Jr., <sup>1</sup>	West Newton,	53 Lincoln Avenue.
Bent, Winthrop Herbert, <sup>1</sup>	Watertown,	87 Pleasant Street.
Birchard, John Dickson,	Springfield,	14 Nutting Avenue.
Bisbee, Philip Emerson, <sup>1</sup>	Waitsfield, Vt.,	85 Pleasant Street.
Boaz, William Henry, <sup>1</sup>	Covesville, Va.,	6 Nutting Avenue.
Boles, Robert Stewart,	Dorchester,	4 Chestnut Street.
Bonn, Wesley Copeland,	Grafton,	5 Nutting Avenue.
Booth, Alfred, <sup>1</sup>	Middletown, N. Y.,	Care of Professor Morton.
Boyce, Harold Prescott, <sup>1</sup>	Haverhill,	7 Nutting Avenue.
Bradley, William George, <sup>1</sup>	Groton,	88 Pleasant Street.
Buchanan, Walter Gray, <sup>1</sup>	Chicopee,	97 Pleasant Street.
Buck, Rollin Hugh, <sup>1</sup>	Worcester,	90 Pleasant Street.
Buckman, Lewis Taylor,	Wilkes-Barre, Pa.,	88 Pleasant Street.
Burleigh, Arthur Leslie, <sup>1</sup>	Lynn,	85 Pleasant Street.

<sup>1</sup> Work incomplete.

Burnham, Chester Arthur, . . .	Westford, . . .	Fitts House.
Buttrick, David Herbert, . . .	Arlington, . . .	120 Pleasant Street.
Calderwood, Herbert Hale, <sup>1</sup> . . .	Rockport, Me., . . .	Nutting Avenue, Care of Mr. Plumb.
Carruth, Glenn Howard, <sup>1</sup> . . .	Orange, . . .	36 North Prospect Street.
Chamberlain, Sumner Fiske, . . .	Holden, . . .	Commons Club.
Chamberlin, Frank Shirley, <sup>1</sup> . . .	South Framingham, . . .	3 McClellan Street.
Chamberlin, Raymond, <sup>1</sup> . . .	New York, N. Y., . . .	85 Pleasant Street.
Cotton, Elwyn Page, <sup>1</sup> . . .	Woburn, . . .	East Experiment Station.
Cross, Walter Irving, . . .	Hingham, . . .	53 Lincoln Avenue.
Davis, Monsell Henry, . . .	Orange, N. J., . . .	Care of S. J. Wright.
Day, James Harold, . . .	Hatfield, . . .	16 South College.
Dempsey, Paul Wheeler, . . .	Dorchester, . . .	82 Pleasant Street.
Dickey, Harold Gammell, . . .	Dorchester, . . .	Poultry Plant.
Dinsmore, Donald Sanderson, . . .	Springfield, . . .	88 Pleasant Street.
Dizer, John Thomas, . . .	East Weymouth, . . .	West Experiment Station.
Dudley, Lofton Leland, . . .	Belchertown, . . .	Belchertown.
Duffill, Edward Stanley, <sup>1</sup> . . .	Melrose Highlands, . . .	17 Fearing Street.
Dunham, Henry Gurney, . . .	West Bridgewater, . . .	79 Pleasant Street.
Dunn, Arthur Paul, . . .	Malden, . . .	4 Chestnut Street
Edwards, Francis Gill, <sup>1</sup> . . .	Beverly, . . .	83 Pleasant Street.
Elliot, Ralph William, . . .	Chartley, . . .	Flint Laboratory.
Everbeck, George Charles, . . .	Winthrop, . . .	Care of Mr. Green, Mount Pleasant.
Fearing, Ralph Watson, . . .	Dorchester, . . .	7 Nutting Avenue.
Ferris, Adaline Lawson, . . .	Ridgefield Park, N. J., . . .	Draper Hall.
Flagg, Wayne McCrillis, <sup>1</sup> . . .	Mittineague, . . .	90 Pleasant Street.
Flint, Oliver Simeon, . . .	Lowell, . . .	120 Pleasant Street.
Goldstein, Maurice, . . .	West Lynn, . . .	58 Pleasant Street.
Graham, Leland Jenkins, . . .	Amherst, . . .	Lincoln Avenue.
Grayson, Emory Ellsworth, . . .	Milford, . . .	Care of Professor Morton.
Groff, Howard Clarkson, <sup>1</sup> . . .	Amherst, . . .	South Pleasant Street.
Gurshin, Carl Alfred, . . .	Lynn, . . .	35 North Prospect Street.
Hagelstein, Charles Henry, . . .	Dorchester, . . .	Kappa Gamma Phi.
Hallett, Charles Hiram, <sup>1</sup> . . .	Mansfield, . . .	120 Pleasant Street.
Harlow, Frank Edward, . . .	Malden, . . .	77 Pleasant Street.
Harlow, Paul Goodhue, . . .	Malden, . . .	77 Pleasant Street.
Heffron, Paul John, <sup>1</sup> . . .	Sherborn, . . .	North Pleasant Street.
Henderson, Elliott, . . .	Hingham, . . .	9 South College.
Higginbotham, Harry, . . .	Taunton, . . .	88 Pleasant Street.
Higgins, Gardner William, . . .	Norfolk, . . .	85 Pleasant Street.
Hill, Edmund Baldwin, <sup>1</sup> . . .	Rutherford, N. J., . . .	85 Pleasant Street.
Holden, Richard Lynde, . . .	Haverhill, . . .	82 Pleasant Street.
Holder, Ralph Clifton, . . .	Millis, . . .	17 Kellogg Avenue.
Holt, Francis Stetham, <sup>1</sup> . . .	Cambridge, . . .	77 Pleasant Street.
Hooper, Albert Averill, <sup>1</sup> . . .	Lynn, . . .	96 Pleasant Street.
Hubbell, Franklin Homer, . . .	Westport, Conn., . . .	M. A. C. Farm House.
Illman, Margaret Keble, . . .	Amherst, . . .	Amherst, R. F. D. No. 2.
Irving, William Raymond, <sup>1</sup> . . .	Taunton, . . .	88 Pleasant Street.
Jackson, Richmond Merrill, . . .	Georgetown, . . .	36 North Prospect Street.
Keegan, Thomas Michael, <sup>1</sup> . . .	Worcester, . . .	88 Pleasant Street.
Kelsey, Edmund Dean, <sup>1</sup> . . .	Amherst, . . .	Pelham Road.
Kelsey, Lincoln David, . . .	West Hartford, Conn., . . .	90 Pleasant Street.
Kinsman, Alfred Oberlin, Jr., <sup>1</sup> . . .	Merrimac, . . .	17 Kellogg Avenue.
Larson, Frederick Christian, <sup>1</sup> . . .	Everett, . . .	Kappa Gamma Phi.
Latham, Paul Walker, . . .	Norwich Town, Conn., . . .	96 Pleasant Street.
Lawrence, Milford Robinson, . . .	Falmouth, . . .	83 Pleasant Street.
Light, Brooks, <sup>1</sup> . . .	Milton, . . .	73 Pleasant Street.
Livermore, William Tingley, . . .	Lawrence, . . .	83 Pleasant Street.
Loring, Albert Briggs, . . .	Nantasket Beach, . . .	53 Lincoln Avenue.
Lydiard, Harry Crowther, . . .	Hartford, Conn., . . .	3 Nutting Avenue.
Mack, <sup>1</sup> Walter Adams, . . .	Springfield, . . .	Kappa Gamma Phi.

<sup>1</sup> Work incomplete.

MacLeod, Daniel Johnston, <sup>1</sup>	Wakefield,	Care of S. J. Wright.
Mars, Malcolm Rowe, <sup>1</sup>	Walpole,	20 South College.
Mather, Fred,	Amherst,	Fitts House.
Mayo, Frank Willard, <sup>1</sup>	Houlton, Me.,	120 Pleasant Street.
Mayo, William Irving, Jr.	Framingham,	M. A. C. Farm House.
McRae, Herbert Ranklin, <sup>1</sup>	Malden,	15 Fearing Street,
Merrill, Dana Otis,	Pepperell,	Commons Club.
Moorhouse, Newell,	Worcester,	10 South College.
Nash, Herman Beaman, <sup>1</sup>	Amherst,	R. F. D. No. 1.
Nelson, John Brockway,	Newburyport,	3 Nutting Avenue.
Nims, Homer Willis,	Montague,	Experiment Station.
Noyes, Samuel Verne,	Georgetown,	90 Pleasant Street.
Patton, Willard Ginn,	South Framingham,	M. A. C. Farm House.
Pierce, Harold Barnard, <sup>1</sup>	Kansas City, Mo.,	80 Pleasant Street.
Pike, Chester Arthur, <sup>1</sup>	Smiths,	82 Pleasant Street.
Pratt, Harold Arthur,	Shrewsbury,	Care of Professor Morton.
Quimby, Charles Frederick,	Cape Neddick, Me.,	33 East Pleasant Street.
Randall, Earle MacNeill,	Somerville,	82 Pleasant Street.
Richardson, Lewis Elmer, <sup>1</sup>	Rockville,	82 Pleasant Street.
Ritter, Ernest,	New Britain, Conn.,	88 Pleasant Street.
Rodger, Raymond Miller,	Everett,	90 Pleasant Street.
Rogers, Roland Winsor,	Roxbury,	25 Lincoln Avenue.
Rorstrom, Hans Alfred,	Boston,	82 Pleasant Street.
Rosequist, Birger Reigold,	Brockton,	85 Pleasant Street.
Ross, Louis Warren, <sup>1</sup>	Arlington,	120 Pleasant Street.
Rutter, Walter Frederick, <sup>1</sup>	Lawrence,	17 Fearing Street.
Saidel, Harry Samuel, <sup>1</sup>	Worcester,	3 Nutting Avenue.
Sargent, George Leonard, <sup>1</sup>	Merrimac,	17 Kellogg Avenue.
Sauter, John Martin,	Turners Falls,	60 Pleasant Street.
Saville, William, Jr.,	Waban,	6 South College.
Schaefer, Leonard Charles, <sup>1</sup>	Amherst,	Entomology Building.
Schwab, Andrew Nathan, <sup>1</sup>	Yalesville, Conn.,	M. A. C. Plant House.
Scott, George Alvin,	Clinton,	36 North Prospect Street.
Shumway, Paul Edward, <sup>1</sup>	Greenfield,	60 Pleasant Street.
Sims, James Stanley, <sup>1</sup>	Melrose,	120 Pleasant Street.
Smith, Herbert Dwight,	Poughkeepsie, N. Y.,	Care of E. N. Davis.
Smith, Philip Lawrence, <sup>1</sup>	Kingston,	5 Sunset Avenue.
Smith, Richard Woodworth,	Pittsfield,	96 Pleasant Street.
Spaulding, Almon Whitney,	Dorchester,	18 Nutting Avenue.
Squires, Paul Revere, <sup>1</sup>	Belchertown,	Belchertown.
Stackpole, Frank Charles, <sup>1</sup>	Somerville,	82 Pleasant Street.
Stearns, Carlton McIntyre,	Melrose,	5 Nutting Avenue.
Stiles, Albert Ralph,	Arlington,	36 North Prospect Street.
Stjernlof, Axel Uno,	Worcester,	Brooks Farm.
Stowell, Harold Thurber,	Amherst,	193 South Pleasant Street.
Sturtevant, Warner Butterfield,	Springfield,	14 Nutting Avenue.
Swift, Raymond Walter,	North Amherst,	76 Summer Street.
Thayer, William Wallace, <sup>1</sup>	Somerville,	Care of Mr. Green, Mount Pleasant.
Tuthill, Samuel Fuller,	Mattapoisett,	M. A. C. Farm House.
Upson, Everett Langdon, <sup>1</sup>	New Britain, Conn.,	87 Pleasant Street.
Walbridge, Henry Blood,	Bennington, Vt.,	M. A. C. Farm House.
Warner, Merrill Pomeroy,	Sunderland,	5 South College.
Warren, Harold Manson, <sup>1</sup>	Melrose,	5 McClellan Street.
Warren, James Joseph,	North Brookfield,	35 North Prospect Street.
Webster, Frank Cedric,	Harvard,	82 Pleasant Street.
Westman, Robert Clayton,	Roslindale,	Kappa Gamma Phi.
Whitecomb, Warren Draper,	Waltham,	88 Pleasant Street.
Whitney, Joseph Fradley, <sup>1</sup>	Brooklyn, N. Y.,	96 Pleasant Street.
Wilber, Charles Raymond,	Walpole,	Care of Professor Sears.
Williams, Arthur Franklin,	Sunderland,	7 South College.
Williams, Herbert Clifton,	South Hadley Falls,	29 Pleasant Street.

<sup>1</sup> Work incomplete.

## FRESHMAN CLASS.

Additon, Elizabeth Emery, <sup>1</sup>	Newtonville,	Draper Hall.
Allen, Amos Lawrence,	Dalton,	35 North Prospect Street.
Allen, Leland Christy,	Holyoke,	75 Pleasant Street.
Allen, Ralph Emerson,	Everett,	17 Phillips Street.
Babbitt, Frank Madison,	Fairhaven,	M. A. C. Farm House.
Bainbridge, Frank,	Paterson, N. J.,	Care of Mr. Whittier, Mount Pleasant.
Baker, Foster Kenneth,	Fairhaven,	116 Pleasant Street.
Baker, Henry Raymond,	Amherst,	West Street.
Barbour, Francis Collin,	Hartford, Conn.,	87 Pleasant Street.
Barton, George Wendell,	North Sudbury,	36 North Prospect Street.
Baxter, Herbert Hill,	Brighton,	15 Phillips Street.
Beadlé, Herbert Oumpaugh,	Lima, N. Y.,	6 Phillips Street.
Bennett, Edgar Stearns, <sup>1</sup>	Blackstone,	42 McClellan Street.
Binks, Frank Joseph, <sup>1</sup>	Maynard,	29 North Prospect Street.
Bolster, Rolfe Nelson, <sup>1</sup>	Worcester,	15 Phillips Street.
Boyd, Robert Lucius, <sup>1</sup>	Lynn,	Kappa Gamma Phi.
Brigham, Sylvia Bowen,	Newtonville,	Draper Hall.
Brown, Robert Edward, <sup>1</sup>	Sharon,	36 North Prospect Street.
Bruce, Walter Griffith,	Springfield,	21 Fearing Street.
Burch, Chester Swan,	Hopkinton,	77 Pleasant Street.
Cameron, Walter Leslie,	Palmer,	66 Pleasant Street.
Canlett, Franklin Harwood,	Bedford,	28 Northampton Road.
Capen, Howard Boyden,	Canton,	Brooks Farm,
Carlson, Fred Albert,	Pittsfield,	84 Pleasant Street.
Carter, Thomas Edward,	West Andover,	Brooks Farm.
Chambers, Roger James,	Dorchester,	6 Nutting Avenue.
Chapman, John Alden,	Salem,	83 Pleasant Street.
Cheffers, Louis David,	Worcester,	1 South College.
Clapp, Roger Francis,	Salem,	17 Phillips Street.
Clark, Stewart Sandy, <sup>1</sup>	Holyoke,	5 Nutting Avenue.
Davis, Dwight Shaw,	Ayer,	31 East Pleasant Street.
Drummond, Joseph Lawrence, <sup>1</sup>	Holyoke,	4 Chestnut Street.
Dubois, George Arthur,	Fall River,	17 Fearing Street.
Dunean, George James,	Arlington,	3 Nutting Avenue.
Durfee, Norman Owen, <sup>1</sup>	Fall River,	79 Pleasant Street.
Edes, David Oliver Nourse,	Bolton,	35 East Pleasant Street.
Ellis, Ralph Chick, <sup>1</sup>	West Newton,	6 Phillips Street.
Emmerich, Louis Philip,	Paterson, N. J.,	Mount Pleasant.
Erickson, George Edwin,	Brockton,	21 Fearing Street.
Faber, Edward Stuart,	Plainfield, N. J.,	Care of S. J. Wright.
Fairchild, Robert Dunning,	Newtown, Conn.,	30 North Prospect Street.
Faneuf, Leo Joseph,	West Warren,	Brooks Farm.
Farrar, Delwin Bruce,	Amherst,	1 Dana Street.
Fellows, Harold Carter,	Peabody,	6 Phillips Street.
Ferriss, Samuel Boynton,	New Milford, Conn.,	4 Chestnut Street.
Fletcher, Walter Greene,	Newton,	53 Lincoln Avenue.
Foley, William Albert,	Palmer,	35 North Prospect Street.
Foster, Hamilton Knight,	New Rochelle, N. Y.,	24 Beston Street.
Foster, Roy Wentworth,	Lynn,	56 North Pleasant Street.
Frellick, Arthur Lester,	Everett,	17 Phillips Street.
Fuller, Camille Baldwin,	West Quincy,	17 Phillips Street.
Garvey, Mary Ellen Monica,	Amherst,	27 South Prospect Street.
Gasser, Thomas Jefferson,	Uxbridge,	Care of Professor Morton.
Gifford, Flavel Mayhew,	West Tisbury,	6 Nutting Avenue.
Gilbert, Howard Goodwin, <sup>1</sup>	Beverly,	15 Hallock Street.
Gillette, Nathan Warner,	Revere,	35 East Pleasant Street.
Goodridge, George Lucien,	Melrose,	53 Lincoln Avenue.
Goodwin, William Irving,	Haverhill,	Brooks Farm.

<sup>1</sup> Work incomplete.

Gordon, Frederick George, . . . . .	Plymouth, . . . . .	Care of Mrs. Taber, North Amherst.
Grayson, Forrest, . . . . .	Milford, . . . . .	Care of Professor Morton.
Haines, Foster Kingsley, . . . . .	Peabody, . . . . .	7 Nutting Avenue.
Hance, Forrest Sansbury, . . . . .	Paterson, N. J., . . . . .	Care of Mr. Whittier, Mount Pleasant.
Harwood, Ralph Wallace, . . . . .	Barre, . . . . .	66 Pleasant Street.
Hawley, Robert Dorman, . . . . .	Springfield, . . . . .	15 Phillips Street.
Higgins, Leo Clement, . . . . .	Amesbury, . . . . .	116 Pleasant Street.
Holmes, George Frederick, <sup>1</sup> . . . . .	Ipswich, . . . . .	60 Pleasant Street.
Holmes, Robert Palmer, . . . . .	Wakefield, . . . . .	Brooks Farm.
Howard, Arthur Merchant, . . . . .	Pittsfield, . . . . .	84 Pleasant Street.
Howe, Albert Edward, <sup>1</sup> . . . . .	Needham, . . . . .	3 Phillips Street.
Howe, George Cole, . . . . .	Worcester, . . . . .	Care of Professor Morton.
Hoves, Donald Francis, . . . . .	Ashfield, . . . . .	Brooks Farm.
Hunnewell, Paul Fiske, <sup>1</sup> . . . . .	West Somerville, . . . . .	13 Phillips Street.
Huntoon, Douglas Henderson, . . . . .	Norwood, . . . . .	7 Nutting Avenue.
Hurlburt, Ralph Walter, <sup>1</sup> . . . . .	Ashley Falls, . . . . .	94 Pleasant Street.
Ingalls, Irving Weaver, . . . . .	Brooklyn, N. Y., . . . . .	21 Fearing Street.
Irvine, Robert Patterson, . . . . .	Wilmette, Ill., . . . . .	60 Pleasant Street.
Jenks, Albert George, <sup>1</sup> . . . . .	Norton, . . . . .	12 Cottage Street.
Johnson, Birger Lars, . . . . .	Dorchester, . . . . .	29 McClellan Street.
Johnson, Sidney Clarence, . . . . .	Gloucester, . . . . .	13 Phillips Street.
Jones, Forrest Dean, . . . . .	Worcester, . . . . .	120 Pleasant Street.
Jones, Harold Ellis, . . . . .	New Canaan, Conn., . . . . .	Care of E. F. Gaskill.
Jones, Leon Dudley, . . . . .	Worcester, . . . . .	120 Pleasant Street.
Kennedy, Carl Francis, <sup>1</sup> . . . . .	Milford, . . . . .	Care of Professor Morton.
Kirkham, Philip Leffingwell, <sup>1</sup> . . . . .	Springfield, . . . . .	7 Nutting Avenue.
Knight, Frank Edward, <sup>1</sup> . . . . .	Brimfield, . . . . .	58 North Pleasant Street.
Lanphear, Marshall Olin, . . . . .	Windsor, Conn., . . . . .	35 East Pleasant Street.
Lasker, David, . . . . .	Hyde Park, . . . . .	38 Cottage Street.
Lawrence, Lewis Henry, . . . . .	Falmouth, . . . . .	83 Pleasant Street.
Lawton, Ralph Wilber, <sup>1</sup> . . . . .	Fall River, . . . . .	75 Pleasant Street.
Leiper, McCarrell Hudson, . . . . .	Blauvelt, N. Y., . . . . .	116 Pleasant Street.
Levine, Darwin Solomon, . . . . .	Sherborn, . . . . .	38 Cottage Street.
Lipshires, David Mathew, . . . . .	Winter Hill, . . . . .	14 Nutting Avenue.
Loring, William Rupert, . . . . .	Housatonic, . . . . .	94 Pleasant Street.
Lusk, John Isaiah, . . . . .	Marlborough, . . . . .	7 High Street.
Lyons, Louis Martin, . . . . .	Norwell, . . . . .	29 North Prospect Street.
Maginnis, John Joseph, . . . . .	Lawrence, . . . . .	35 North Prospect Street.
Mallorey, Alfred Sidney, . . . . .	Lynn, . . . . .	15 Hallock Street.
Marshall, Max Skidmore, . . . . .	Amherst, . . . . .	44 Sunset Avenue.
Mather, William, . . . . .	Amherst, . . . . .	Fitts House.
McClellan, Adams Newton, <sup>1</sup> . . . . .	Keene, N. H., . . . . .	35 East Pleasant Street.
McKechnie, Donald, . . . . .	Sharon, . . . . .	Brooks Farm.
McKee, William Henry, . . . . .	Chelsea, . . . . .	Brooks Farm.
Messenger, Kenneth Leroy, . . . . .	Winsted, Conn., . . . . .	35 East Pleasant Street.
Millard, Harold Baldwin, . . . . .	Great Barrington, . . . . .	5A East Pleasant Street.
Minor, John Bacon, Jr., . . . . .	Plainville, Conn., . . . . .	79 Pleasant Street.
Mitchell, Edward Nahum, . . . . .	Medford, . . . . .	36 North Prospect Street.
Mitchell, Theodore Bertis, . . . . .	Needham, . . . . .	Brooks Farm.
Mower, Carl Taft, . . . . .	Montpelier, Vt., . . . . .	35 East Pleasant Street.
Newton, Edward Buckland, . . . . .	Holyoke, . . . . .	5 Nutting Avenue.
Newton, Gaylord Arthur, . . . . .	Durnham, Conn., . . . . .	3 Fearing Street.
Norcross, Gardner Clyde, . . . . .	Brimfield, . . . . .	58 North Pleasant Street.
Odams, Lester Nichols, <sup>1</sup> . . . . .	Salem, . . . . .	120 Pleasant Street.
O'Neill, Oliver Maurice, . . . . .	Dorchester, . . . . .	16 Pleasant Street.
Patch, Lawrence Henry, . . . . .	Wenham, . . . . .	120 Pleasant Street.
Petit, Arthur Victor, . . . . .	Amherst, . . . . .	31 East Pleasant Street.
Phipps, Clarence Ritchie, . . . . .	Dorchester, . . . . .	77 Pleasant Street.
Powell, James Congdon, . . . . .	Newport, R. I., . . . . .	77 Pleasant Street.
Pratt, Oliver Goodell, . . . . .	Salem, . . . . .	17 Phillips Street.

<sup>1</sup> Work incomplete.

Preble, John Nelson, . . . .	Jamaica Plain, . . . .	42 McClellan Street.
Randall, Waring Eugene, <sup>1</sup> . . . .	Belchertown, . . . .	Belchertown.
Raymond, Clinton Rufus, . . . .	Beverly, . . . .	35 North Prospect Street.
Reumann, Theodore Henry, . . . .	New Bedford, . . . .	31 East Pleasant Street.
Richardson, Stephen Morse, . . . .	Marlborough, . . . .	South College.
Robbins, Waldo Whiting, . . . .	Hingham, . . . .	53 Lincoln Avenue.
Roberts, Oliver Cousens, . . . .	Boston, . . . .	36 North Prospect Street.
Robinson, William Herbert, . . . .	Lynn, . . . .	56 North Prospect Street.
Russell, Howard Leigh, . . . .	Worcester, . . . .	116 Pleasant Street.
St. George, Raymond Alexander, . . . .	Lynn, . . . .	15 Hallock Street.
Sampson, Fred Bucknam, <sup>1</sup> . . . .	Fall River, . . . .	60 North Pleasant Street.
Sanborn, Deane Waldron, . . . .	Nantucket, . . . .	Care of S. J. Wright.
Sawyer, Wesley Stevens, . . . .	Boston, . . . .	42 McClellan Street.
Sawyer, William George, . . . .	Berlin, . . . .	Care of S. J. Wright.
Schlough, George Homer, . . . .	Waltham, . . . .	31 East Pleasant Street.
Seavey, Arthur Jones, . . . .	New Braintree, . . . .	Pease Avenue.
Sedgwick, Alfred, <sup>1</sup> . . . .	Fall River, . . . .	116 Pleasant Street.
Sliski, John, . . . .	Springfield, . . . .	—
Smith, Carleton Tower, . . . .	West Newton, . . . .	116 Pleasant Street.
Smith, Sidney Sumner, . . . .	Boston, . . . .	32 North Prospect Street.
Spaulding, Lewis Winans, <sup>1</sup> . . . .	South Hingham, . . . .	Care of Professor Morton.
Spencer, Arthur Winthrop, . . . .	Danvers, . . . .	12 Cottage Street.
Stanton, Frank Parker, . . . .	Revere, . . . .	35 East Pleasant Street.
Stickney, Stephen Arthur, . . . .	West Peabody, . . . .	7 Nutting Avenue.
Stowe, Raymond Timothy, . . . .	Enfield, Conn., . . . .	35 East Pleasant Street.
Stowers, Addison Clifford, . . . .	Dorchester, . . . .	15 Phillips Street.
Strong, William Perkins, <sup>1</sup> . . . .	South Hadley Falls, . . . .	Pine Street, North Amherst.
Sullivan, Harold Leo, . . . .	Lawrence, . . . .	35 North Prospect Street.
Sutherland, Ralph, . . . .	Cambridge, . . . .	77 Pleasant Street.
Swift, Hubbard, . . . .	West Falmouth, . . . .	83 Pleasant Street.
Thayer, Weston Cushing, . . . .	Hingham, . . . .	53 Lincoln Avenue.
Thompson, Wells Nash, . . . .	Adams, . . . .	79 Pleasant Street.
Thorpe, Richard Warren, . . . .	West Medford, . . . .	17 Cottage Street.
Tilton, Arthur Dana, . . . .	Wellesley, . . . .	15 Phillips Street.
Tucker, Lee Heston, . . . .	Ware, . . . .	8 North College.
Underwood, Arthur Leslie, . . . .	Stow, . . . .	35 East Pleasant Street.
vanAlstyne, Lewis Morrell, . . . .	Kinderhook, N. Y., . . . .	35 East Pleasant Street.
Vickers, John, . . . .	Deerfield, . . . .	36 North Prospect Street.
Warren, Wesley Raymond, . . . .	Worcester, . . . .	15 Phillips Street.
Weeks, Roger Wolcott, . . . .	Hyde Park, . . . .	35 East Pleasant Street.
Wilbur, Laurence Weston, . . . .	South Middleborough, . . . .	23 East Pleasant Street.
Willoughby, Raymond Royce, . . . .	Newington, Conn., . . . .	24 Beston Street.
Wolfson, Louis Elijah, . . . .	Malden, . . . .	38 Cottage Street.
Woodbury, Ray Willard, <sup>1</sup> . . . .	Newburyport, . . . .	Care of H. G. Russell, Cot- tage Street.
Wooding, Paul Bennett, <sup>1</sup> . . . .	Yalesville, Conn., . . . .	35 East Pleasant Street.
Woods, Frank Archibald, . . . .	Groton, . . . .	5 Nutting Avenue.
Woodworth, Brooks, . . . .	Lowell, . . . .	6 Nutting Avenue.
Worthley, Harlan Noyes, . . . .	Greenwood, . . . .	14 Nutting Avenue.
Wright, John Lindsey, <sup>1</sup> . . . .	Putnam, Conn., . . . .	77 Pleasant Street.
Yesair, John, . . . .	Byfield, . . . .	36 North Prospect Street.

## UNCLASSIFIED STUDENTS.

Brawn, Howard Drown, . . . .	Mansfield, . . . .	32 North Prospect Street.
Derby, Llewellyn Light, . . . .	Hudson, . . . .	35 East Pleasant Street.
Dillon, Thomas Stevenson, <sup>1</sup> . . . .	West Warren, . . . .	35 East Pleasant Street.
Fellows, Katharine Adelheid, . . . .	Northampton, . . . .	21 Amity Street.
Floyd, Fred Gillan, . . . .	West Roxbury, . . . .	9 Fearing Street.
Fraser, Charles Allen, . . . .	Plymouth, . . . .	35 East Pleasant Street.
Hartwell, Herford Carter, . . . .	Somerville, . . . .	75 Pleasant Street.
Higgins, Lloyd Hale, . . . .	Provincetown, . . . .	31 North Prospect Street.

<sup>1</sup> Work incomplete.

Hill, Donald Russell, . . . . .	Arlington, . . . . .	29 McClellan Street.
Leonard, Nelson Ellsworth, . . . . .	Raynham Center, . . . . .	30 North Prospect Street.
Lindsley, Horace Nelson, <sup>1</sup> . . . . .	Orange, N. J., . . . . .	120 Pleasant Street.
Lydiard, Carl Harold, . . . . .	Boston, . . . . .	3 Phillips Street.
Martin, Thomas James, . . . . .	Holyoke, . . . . .	60 Pleasant Street.
McLean, George Robert, . . . . .	Northampton, . . . . .	60 Washington Avenue, Northampton.
McMurray, Charles Joseph, . . . . .	West Fitchburg, . . . . .	42 McClellan Street.
McNamara, Michael Joseph, . . . . .	Stoughton, . . . . .	35 East Pleasant Street.
Mooradkian, Gregory, . . . . .	Lawrence, . . . . .	Hillside Avenue, R. F. D. No. 126.
Murrin, James Patrick, . . . . .	Dorchester, . . . . .	79 Pleasant Street.
Newton, Raymond Lovejoy, <sup>1</sup> . . . . .	Malden, . . . . .	29 McClellan Street.
O'Brien, Patrick, . . . . .	Pittsfield, . . . . .	60 Pleasant Street.
Parker, Judson Lanphere, . . . . .	Holyoke, . . . . .	56 North Pleasant Street.
Pierce, Harry Walker, . . . . .	West Medford, . . . . .	3 McClellan Street.
Richardson, Royal Phelps, . . . . .	Scituate, . . . . .	29 McClellan Street.
Robinson, Edward Hosmer, . . . . .	Malden, . . . . .	3 McClellan Street.
Rugg, Arthur Prentice, Jr., . . . . .	Worcester, . . . . .	Care of Professor Morton.
Russell, Edward Stanton, . . . . .	New Haven, Conn., . . . . .	73 Pleasant Street.
Studley, Robert Allan, . . . . .	Rockland, . . . . .	116 Pleasant Street.
Talbot, Marjorie, . . . . .	Roxbury, . . . . .	9 Phillips Street.
Tuttle, George Raymond, . . . . .	Waltham, . . . . .	Care of E. F. Gaskill.
Upham, Harlan Willis, <sup>1</sup> . . . . .	Thornton's Ferry, N. H., . . . . .	8 Allen Street.
Winchester, George Taylor, . . . . .	Woburn, . . . . .	75 Pleasant Street.
Winter, Henry George, <sup>1</sup> . . . . .	Ashburnham, . . . . .	120 Pleasant Street.

## SUMMARY BY CLASSES.

Graduate students, . . . . .	52
Senior class, . . . . .	103
Junior class, . . . . .	113
Sophomore class, . . . . .	142
Freshman class, . . . . .	168
Unclassified students, . . . . .	32
Total registration, . . . . .	610

## GEOGRAPHICAL SUMMARY.

Massachusetts, . . . . .	500
Connecticut, . . . . .	35
New York, . . . . .	24
New Jersey, . . . . .	10
Pennsylvania, . . . . .	6
New Hampshire, . . . . .	6
Maine, . . . . .	5
Vermont, . . . . .	5
Ohio, . . . . .	3
Rhode Island, . . . . .	3
Canada, . . . . .	2
Barbados, . . . . .	1
China, . . . . .	1
Delaware, . . . . .	1
Illinois, . . . . .	1
India, . . . . .	1
Japan, . . . . .	1
Michigan, . . . . .	1
South America, . . . . .	1
Virginia, . . . . .	1
Wisconsin, . . . . .	1
Wyoming, . . . . .	1
Total, . . . . .	610

<sup>1</sup> Work incomplete.



## SHORT COURSE STUDENTS.

### THE TEN WEEKS' COURSE.

Adams, Henry L., . . . . .	Elmwood.
Alstrom, Edwin H., . . . . .	Springfield.
Anderson, Mrs. Ernest, . . . . .	Amherst.
Armstrong, Anna W., . . . . .	East Sandwich.
Atwell, Lewis, . . . . .	South Framingham.
Bacon, R. D., . . . . .	Worcester.
Barker, Harry S., . . . . .	Littleton.
Barnard, F., . . . . .	Northampton.
Barnes, James, . . . . .	Yalesville, Conn.
Beckwith, Wm., . . . . .	Springfield, Vt.
Bemis, Ralph A., . . . . .	Spencer.
Bliss, Walter C., . . . . .	Springfield.
Borden, Aubrey W., . . . . .	South Framingham.
Botsford, H. E., . . . . .	Petersham.
Boynton, Paul J., . . . . .	Ausable Forks, N. Y.
Bradford, Clarendon A., . . . . .	North Dorset, Vt.
Bridgman, Gertrude L., . . . . .	South Amherst.
Brown, Mrs. M. W., . . . . .	Windsor.
Bronson, Wesley H., . . . . .	Marlborough.
Bryan, Bart E., . . . . .	West New Brighton, N. Y.
Buck, Edgar H., . . . . .	Warren.
Burnham, William I., . . . . .	Lexington.
Burns, James J., . . . . .	Meriden, Conn.
Buswell, Elmer N., . . . . .	Boston.
Butterfield, Lawrence D., . . . . .	Lexington.
Buxton, Ralph O., . . . . .	Saugus.
Carroll, A. Sidney, . . . . .	Hartford, Conn.
Cathie, Harold, . . . . .	Needham.
Chase, Mrs. Clara, . . . . .	Greenfield.
Chase, Harry E., . . . . .	South Framingham.
Clark, Jesse H., . . . . .	Malden.
Clarke, Stanley, . . . . .	Winchester.
Clarke, Mrs. Stanley, . . . . .	Winchester.
Coe, Ernest A., . . . . .	Greenwich, Conn.
Copeland, Robert A., . . . . .	Townsend.
Coppinger, Edward, . . . . .	Needham Heights.
Corey, Eben Fox, . . . . .	Boston.
Cotter, William, . . . . .	Salem.
Creesy, Richard L., . . . . .	Brookline.
Cresta, Nicholas, . . . . .	Haydenville.
Cunningham, John A., . . . . .	Dorchester.
Curley, John I., . . . . .	Holyoke.
Cushman, Burt A., . . . . .	Bernardston.
Cushman, R. F., . . . . .	Sylvania, O.
Cutler, Paul E., . . . . .	Boylston.
Dana, Alfred L., . . . . .	Amherst.
Dascomb, Jean, . . . . .	Westminster, Vt.
Davis, P. I., . . . . .	Chestnut Hill.
Dawson, Harry Custer, . . . . .	Tewksbury.
Diaz, Mrs. Ralph M., . . . . .	Belmont.
Diaz, Ralph M., . . . . .	Belmont.

Dickinson, Richard S., . . . . .	Granville.
Dickinson, W. L., . . . . .	Helena, Mont.
Dimock, Dwight L., . . . . .	Billerica.
Doten, Clarence A., . . . . .	Lincoln.
Ely, Ralph A., . . . . .	Holyoke.
Everson, Carroll W., . . . . .	Amherst.
Everson, Wesley E., . . . . .	West Hanover.
Farrar, Marion A., . . . . .	South Framingham.
Fellows, Katharine A., . . . . .	Northampton.
Fisher, Austin L., . . . . .	North Amherst.
Fiske, Wm. M., . . . . .	Northampton.
Fitton, Willard S., . . . . .	Dorchester.
Flagg, E. M., . . . . .	Florence.
Foster, Charles H., . . . . .	North Andover.
Frye, Caleb B., . . . . .	Dorchester.
Gale, Lawrence S., . . . . .	Charlemont.
Gifford, J. E., . . . . .	Danvers.
Glazier, H. E., . . . . .	Andover.
Gordon, Harrington M., . . . . .	Auburndale.
Graves, Charles E., . . . . .	Haydenville.
Green, H. L., Jr., . . . . .	Worcester.
Greenwood, L. J., . . . . .	Billerica.
Gregson, B. N., . . . . .	Boston.
Harthan, Harold C., . . . . .	West Boylston.
Hastings, M. Leroy, . . . . .	Whitinsville.
Hawks, Paul, . . . . .	Deerfield.
Hayden, Luman H., . . . . .	Hudson.
Heald, Philip C., . . . . .	Greenville, N. H.
Hemenway, C. M., . . . . .	Williamsburg.
Herrick, Clifton H., . . . . .	Raynham.
Herrick, Frank L., . . . . .	Brookline.
Higgins, Edward L., . . . . .	North Billerica.
Hinman, Wilbur S., . . . . .	Bennington, Vt.
Holden, Lester, . . . . .	Shirley.
Holmes, Arthur C., . . . . .	Kingston.
Hopkins, Chas. Warner, . . . . .	Brattleboro, Vt.
Howe, Harold H., . . . . .	Kingston.
Hunter, R. D., . . . . .	West Claremont, N. H.
Hopkinson, H. B., . . . . .	Cambridge.
Irons, Marion R., . . . . .	Boston.
Keith, Russell S., . . . . .	East Bridgewater.
Kenyon, S. W., . . . . .	New Bedford.
Killam, John, . . . . .	East Boxford.
Klang, M. I., . . . . .	East Canaan, Conn.
Lathrop, Benson M., . . . . .	Pittsfield.
Lefevre, Herbert T., . . . . .	Jamaica Plain.
Lehr, F. L., Jr., . . . . .	New Haven, Conn.
Le Provost, Lyle F., . . . . .	Lee.
Littlefield, Ray Leon, . . . . .	Auburn.
Lorion, E. H., . . . . .	Worcester.
Lyons, Thomas E., . . . . .	Worcester.
Martin, Ralph, . . . . .	Montague.
Merrell, Charles E., . . . . .	West Somerville.
Merrell, Ralph, . . . . .	Suffield, Conn.
Milk, Mrs. M. E., . . . . .	South Amherst.
Miller, Donald H., . . . . .	Whitman.
Mumford, W. C., . . . . .	Springfield.
Newhall, Hermann A., . . . . .	Sterling Junction.
Nicholls, Raymond F., . . . . .	Northampton.
Norrman, Karl A., . . . . .	Lynn.
O'Donnell, Ambrose, . . . . .	Jamaica Plain.
O'Donnell, J. C., . . . . .	Belchertown.
Parsons, Earle M., . . . . .	Northampton.
Parsonson, Alfred H., . . . . .	Peabody.

Partridge, Francis A., Jr.,	Woburn.
Pearmain, John D.,	Framingham.
Platt, Clarence I.,	Milford, Conn.
Post, Charles L.,	Great Barrington.
Potter, Roger W.,	Worcester.
Putney, Luther R.,	Marblehead.
Record, Harold J.,	West Boylston.
Rich, Alton F.,	Winthrop.
Rooney, Nelson L.,	Bedford.
Ropes, Ernest C.,	Boston.
Ropes, Mrs. Nathalie W.,	Boston.
Roundy, Perley B.,	Beverly.
Russell, Ivo A.,	Concord Junction.
Russell, Raymond M.,	Quincy.
Russell, Mrs. Renouf,	Keene, N. H.
Russell, Renouf,	Keene, N. H.
Sanders, Eugene,	Wollaston.
Sandford, Geo. T.,	Plattsburg, N. Y.
Sanford, Raymond,	Plattsburg, N. Y.
Sawyer, Henry A.,	Worcester.
Scott, Keith,	Brookline.
Shaw, W. F.,	Orange.
Siech, P. H.,	Springfield.
Silk, Jack,	Lowell.
Sinclair, Harrop S.,	Northampton.
Skillings, Mrs. D. U.,	Amherst.
Smith, Allison P.,	Cambridge.
Smith, Bowdoin B.,	East Weymouth.
Snoji, Shiina,	Japan.
Snyder, Henry H.,	Cummington.
Stentiford, Henry,	Irvington, N. Y.
Stevens, Edward Reed,	Worcester.
Stiles, Lawrence,	Amherst.
Stone, Frederick T.,	Chelsea.
Stoughton, Philip,	Montague.
Sussmann, Rudolph,	Sharon.
Talty, T. L.,	Boston.
Tappan, Cushing,	Cambridge.
Teplenke, I.,	Raynham Center.
Thornburg, Paul,	Ashland, O.
Tinkham, W. Earle,	North Raynham.
Totman, William,	Bardwell's Ferry.
Trull, Larkin T., Jr.,	Lowell.
Turner, Miss A. C.,	Quincy, Ill.
Turner, Ralph C.,	Amherst.
Tyler, John,	Brookline.
Tyler, Mrs. John,	Brookline.
Urbaitis, Frank,	Worcester.
Van Valkenburgh, Hugh,	State Line.
Veprek, Vencenc,	Springfield.
Wade, Francis C.,	West Newbury.
Walker, Henry P.,	Hudson.
Walsh, Henry J.,	Kingston.
Walsh, Lloyd,	Amherst.
Wells, Collin,	Hanover, N. H.
Wendel, Mrs. Theodore,	Ipswich.
Whitlock, Aaron B.,	Warehouse Point, Conn.
Whitman, Frank L.,	Griswoldville.
Wilbur, W. A.,	Lanesborough.
Wilcox, Ralph Henry,	Middletown, Conn.
Willard, Winn,	Cambridge.
Williams, G. R.,	Northampton.
Wilson, Harry C.,	East Lynn.
Wood, Charles A.,	Central Village.

Wood, Oliver W.,	. . . . .	Arlington.
Yale, David H.,	. . . . .	Meriden, Conn.
Young, Harold B.,	. . . . .	Yalesville, Conn.

## APPLE PACKING SCHOOL.

Anderson, O. G.,	. . . . .	East Pepperell.
Bagnell, Fred,	. . . . .	Mount Hermon.
Barnard, Perley D.,	. . . . .	Contoocook, N. H.
Barnard, Raymond J.,	. . . . .	Contoocook, N. H.
Barton, Hubert C.,	. . . . .	South Amherst.
Burke, E. J.,	. . . . .	Hadley.
Castle, F. A.,	. . . . .	Springfield.
Chase, Edith E.,	. . . . .	Stuyvesant, N. Y.
Chase, H. W.,	. . . . .	Cambridge.
Churchill, Mrs. W. W.,	. . . . .	Milton.
Clarke, Lulu E.,	. . . . .	Milton, N. Y.
Davis, Irving G.,	. . . . .	Brimfield.
Doolittle, Albert W.,	. . . . .	Concord Junction.
Elder, David,	. . . . .	Northampton.
Ely, Ralph,	. . . . .	Holyoke.
Frost, H. I.,	. . . . .	Ashby.
Hall, Russell B.,	. . . . .	Medway.
Hulst, Alfred N.,	. . . . .	Amherst.
Leach, C. Arthur,	. . . . .	South Hamilton.
Lindstrom, Mrs. C. R.,	. . . . .	Fayville.
Neall, N. J.,	. . . . .	Boston.
Parker, Chas. M.,	. . . . .	Brookfield.
Porter, Wm. J.,	. . . . .	Groton.
Powers, Frank A.,	. . . . .	Bolton.
Ryan, John C.,	. . . . .	Bennington, Vt.
Taber, L. I.,	. . . . .	Mount Hermon.
Taplin, W. H.,	. . . . .	Brighton.
Whitelock, Wm. M. E.,	. . . . .	Marlborough.

## SCHOOL FOR TREE WARDENS.

Ames, John S.,	. . . . .	North Easton.
Ball, L. P.,	. . . . .	Winchendon.
Benoit, Piesee,	. . . . .	Southbridge.
Brown, Penwal S.,	. . . . .	Scituate.
Bragg, J. W.,	. . . . .	Greenfield.
Bray, Thomas A.,	. . . . .	Holyoke.
Brown, John W.,	. . . . .	Brimfield.
Colton, Wm. W.,	. . . . .	Fitchburg.
Dodge, A. W., Jr.,	. . . . .	Wenham.
Gibbs, R. M.,	. . . . .	Salem.
Hale, Warren F.,	. . . . .	Salem.
Jones, Martin A.,	. . . . .	Northfield.
McCullough, John J.,	. . . . .	Melrose.
McLaughlin, J. H.,	. . . . .	Millers Falls.
Neale, Harold J.,	. . . . .	Worcester.
O'Connell, M. H.,	. . . . .	Millers Falls.
Riley, E. E.,	. . . . .	Needham.
Rust, C. N.,	. . . . .	Granby.
Sawtelle, B. A.,	. . . . .	Greenwich.
Taplin, W. H.,	. . . . .	Brighton.
Whitney, Geo. A.,	. . . . .	Athol.
Worth, Herbert J.,	. . . . .	Gloucester.

## SUMMER SCHOOL.

Allanbrook, Mabel C.,	. . . . .	Everett.
Avery, Roy C.,	. . . . .	Storrs, Conn.
Ayer, Addie M.,	. . . . .	Richford, Vt.

Armstrong, Mrs. L. V. V.,	Bronxville, N. Y.
Backus, Victor T.,	Center Marshfield.
Baker, Helen L.,	Wollaston.
Ballow, Jessica E.,	Enfield.
Berry, James M.,	Everett.
Beston, Mary,	Amherst.
Billings, Mary A.,	Amherst.
Blanchard, Winifred V.,	Roxbury.
Borleugh, Louis,	South Weymouth.
Bradley, Mrs. Mary R.,	Brookline.
Bradley, Parker R.,	Amherst.
Bridgman, Marion E.,	Amherst.
Bradbeck, Paul E.,	Wollaston.
Brooks, Alice O.,	Quincy.
Brooks, Laura J.,	Stoneham.
Bryant, Bertha W.,	Woburn.
Burnap, Margaret,	Woburn.
Burns, Thorton,	Plymouth.
Buswell, Marion E.,	Dorchester.
Capen, Arthur G.,	Worthington.
Cattanach, Henrietta C.,	Boston.
Challiss, Ada L.,	Bronxville, N. Y.
Chamberlain, Edwin M.,	Amherst.
Chamberlain, Mrs. Mary B.,	Amherst.
Chandler, Lorna M.,	Amherst.
Churchill, Josephine,	Ponkapog.
Clark, Katherine,	North Amherst.
Clark, Mary,	Amherst.
Cooke, Grace H.,	New Haven, Conn.
Cooley, Elsie H.,	Amherst.
Davis, Isabel,	Princeton.
Davis, Malcolm W.,	New York City.
Davis, Rufus E.,	Brockton.
Dawson, Ava B.,	Boston.
Dawson, Una G.,	Boston.
Demond, Grace,	Chicopee Falls.
Dorr, Thomas R.,	Williamstown.
Dyer, Vivian,	Auburndale.
Elwell, Mrs. Sybil M.,	Winthrop.
Emanuel, Max.,	New York City.
Epstein, Ida A.,	Amherst.
Epstein, Rose,	Amherst.
Evans, Augusta D.,	Frackville, Pa.
Farrell, Mrs. Helen W.,	Stoughton.
Fauntleroy, Anne M.,	Northampton.
Fay, Charles R.,	Brooklyn, N. Y.
Fernald, Evelyn I.,	Groton.
Flagg, Sadie E.,	West Berlin.
Floyd, F. G.,	West Roxbury.
Floyd, Mrs. F. G.,	West Roxbury.
Fuller, Gertrude A.,	Boston.
Gates, Ruth D.,	Amherst.
Grant, Winnifred L.,	North Attleborough.
Griggs, Jennie E.,	Plymouth, Conn.
Hall, M. Elizabeth,	Amherst.
Harris, Jessie F.,	Whitman.
Harrison, Mrs. A. K.,	Amherst.
Hatch, Bertha E.,	New Milford.
Hatch, Mary J.,	New Milford.
Hearn, Geo. D.,	Holyoke.
Henry, Margaret Lee,	Norwalk, Conn.
Hickey, Nellie M.,	Sunderland.
Holden, Mrs. Austin,	Boston.
Homor, Eleanor J.,	Stoughton.

Hopkins, Lydia L.,	Leominster.
Howard, Alice M.,	North Amherst.
Howard, Clara B.,	North Amherst.
Hoyt, Mrs. Laura A.,	Greenfield.
Hurd, Mrs. W. D.,	Amherst.
Jacobs, Anita A.,	Greenwich, Conn.
James, Edith,	Montclair, N. J.
Johns, Lois,	Amherst.
Johnson, Phyllis,	Amherst.
Joslin, Miss J. M.,	New York City.
Kelsey, Christina,	West Hartford, Conn.
Kendall, Harley F.,	Springfield.
Kennedy, H. Anna,	South Weymouth.
Kenney, Irene E.,	Amherst.
Kingman, Ruth E.,	Somerville.
Klang, M. I.,	Arlington.
Knowles, Grace Vincent,	Natick.
Lawrence, A. Mae,	Worcester.
Lewis, Mayone,	Philadelphia, Pa.
Linehan, Katherine L.,	New York City.
Lockwood, Julia B.,	Norwalk, Conn.
Maloney, Katherine,	Great Barrington.
Marley, Edna,	Cymryd, Pa.
Mathews, Maud A.,	Fall River.
Maynard, Pearl A.,	West Newton.
Merriam, Ida A.,	Malden.
Middleton, Frederick H.,	Amherst.
Mitchell, Edward A.,	Coppahosic, Va.
Moore, Mary A.,	West Haven, Conn.
Moscouelli, Chrestus,	Boston.
McGuire, Helena M.,	Belmont.
McLean, Geo. R.,	Northampton.
Nickerson, Charlotte W.,	Amherst.
Onthank, Charlotte,	Roxbury.
Partridge, Nelson H., Jr.,	Cambridge.
Patterson, Philip M.,	Springfield.
Phelps, Lyman B.,	Northampton.
Richards, Clinton J.,	Northampton.
Richmond, Florence M.,	Meriden, Conn.
Ruggli, Clara W.,	Cambridge.
Russell, Gladys,	Amherst.
Ryan, Bridget A.,	Sunderland.
Safford, Mrs. F. H.,	Philadelphia, Pa.
Samuel, Elizabeth I.,	Boston.
Sayward, Dorothy R.,	Wollaston.
Schweetzer, Edith E.,	Jamaica Plain.
Schweetzer, Walter,	Jamaica Plain.
Scott, Leslie J.,	Amesbury.
Sears, Mrs. F. C.,	Amherst.
Shaw, Mrs. Bertha T.,	Amherst.
Shearman, Janet C.,	Williamstown.
Sheldon, Ernest M.,	Amherst.
Sheridan, Katherine,	Winchester.
Sheridan, Mrs. G. F.,	Winchester.
Sherman, Roger,	Detroit, Mich.
Smith, Atherton C.,	East Boston.
Smith, Clara N.,	North Amherst.
Smith, Mrs. G. R.,	East Boston.
Smith, Stanley W.,	Boston.
Spencer, Elizabeth,	Bridgeport, Conn.
Spencer, Jessie,	Bridgeport, Conn.
Spencer, Mabel,	Bridgeport, Conn.
Stebbins, Blanche,	Lexington.
Stedman, Geo. A.,	Taunton.

Sullivan, Nellie, . . . . .	Three Rivers.
Sagickian, John, . . . . .	East Lynn.
Turner, Mary I., . . . . .	South Meriden, Conn.
Unangst, Royal L., . . . . .	Hingham.
Waid, Mrs. E. D., . . . . .	Amherst.
Walcott, John, . . . . .	Concord.
Walker, Mrs. L. S., . . . . .	Amherst.
Waugh, Edith L., . . . . .	Brockton.
Weeks, Gertrude, . . . . .	Boston.
Welch, Elizabeth A., . . . . .	Fall River.
Wheeler, Ethel M., . . . . .	Bridgeport, Conn.
Whitely, Ethel C., . . . . .	Philadelphia, Pa.
Wheeler, Ethel M., . . . . .	Bridgeport, Conn.
Wiggin, Mary P., . . . . .	Winchester.
Wright, Stuart E., . . . . .	Taunton.
Wright, Elizabeth, . . . . .	Northampton.

## SCHOOL FOR RURAL SOCIAL SERVICE.

Adams, Rev. Raymond, . . . . .	North Brookfield.
Allen, George E., . . . . .	Wendell.
Bottume, Hazel E., . . . . .	Windsor Locks, Conn.
Callahan, Julia F., . . . . .	Lynn.
Curry, Katherine, . . . . .	Lynn.
Damon, Geo. H., . . . . .	Windsor.
Foster, Rev. E. O., . . . . .	Columbia, Conn.
Griffin, J. L., . . . . .	Corvallis, Ore.
Hardy, Rev. Owen E., . . . . .	North Hadley.
Hawk, Rev. Willis B., . . . . .	South Barre.
Howard, E. F., . . . . .	East Northfield.
Kebbe, David L., . . . . .	Cummington.
Loomis, Herbert N., . . . . .	Northampton.
Luce, Robert W., . . . . .	Seymour, Conn.
Panunzio, Constantine M., . . . . .	Amherst.
Pratt, Rev. Hermann J., . . . . .	Granville.
Percy, Rev. C. L., . . . . .	Charlton.
Pines, J. Franklin, . . . . .	Springfield.
Selden, Ruth, . . . . .	Northampton.
Smith, John F., . . . . .	Berea, Ky.
Webb, Daisy, . . . . .	Amherst.
Willett, A. D., . . . . .	Hubbardston.





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# Massachusetts Agricultural College

## Supplement to the Catalog

### NEW COURSES AND MODIFICATIONS IN EXISTING COURSES

Effective September, 1915

Published April, 1915

Courses bearing odd numbers are given in the first semester; those bearing even numbers are given in the second semester.

The page numbers refer to the page in the Catalog for 1914-15, on which the description of the courses in the respective departments will be found.

#### **AGRICULTURAL ECONOMICS.** (Page 82.)

COURSE 11. *Transportation of Agricultural Products.* This course will sketch the development of the transportation in the United States, covering highways, waterways, railways and electric ways with reference to the facilities for and cost of transporting farm products, opening up new agricultural areas or industries and contributing to the wealth and welfare of the agricultural population. The course is designed for juniors, seniors, graduate students and others on approval. Lectures, text and field work; 3 hours, credit 3.

Associate Professor CANCE.

#### **AGRICULTURAL EDUCATION.** (Page 83.)

COURSE 9. *Extension and Demonstration Work.* This course is designed for those students who have interest in and have adaptability for extension work. The work in class will consist of readings, lectures, and reports. Students will be required to present discussions and demonstrations in the field of their major studies before the members of the class.

They will also make trial demonstrations before semi-public audiences composed of faculty members and farmers. These trials are for the purpose of helpful and friendly criticism. The department in which the student does his major work will be responsible for the scientific and technical knowledge. The Department of Agricultural Education will be responsible for the organization and orderly method of the student's presentation. The Extension Service will have charge of the organization and administrative phases of the work. One lecture and two laboratory periods. Credits 3.

Professor HART.

COURSE 10. As stated under Course 9.

#### **AGRONOMY.** (Page 45.)

COURSE 1 has been modified by replacing one lecture period by one two-hour laboratory period. The course will now be given on the basis of two lectures and one laboratory period with a credit of three hours.

## DAIRYING. (Page 48.)

COURSE 3 will now be extended over a full year as Course 3—Milk Products, and Course 4—Market Milk. The course now designated as Course 4 will become Course 6.

## FLORICULTURE.

### *Elective.*

The following courses are to be substituted for those at present offered :

1. *Greenhouse Management.* This course is designed to familiarize students with the methods followed in the management of greenhouse crops. The students are instructed in the practical operation of glazing, concrete bench construction, watering, potting, fumigating, ventilating, and in the methods of propagation of plants by seed and cuttings. They will also be expected to arrange their hours according to the needs of the work. Juniors. Lectures 2. Laboratory, 6 hours. Credit 5. Prerequisite, Horticulture 2. Associate Professor NEHRLING.

2. *Greenhouse Management.* Continuation of Course 1. In addition, work in the use of cut flowers and plants in decorative work, the arrangement of flowers in baskets, designs, vases, table and home decorations, will be considered. Juniors. Lectures 2. Laboratory, 6 hours. Credit 5 hours. Associate Professor NEHRLING.

3. *Commercial Floriculture.* A detailed study will be made of the methods of culture of greenhouse plants and cut flowers for wholesale and retail markets. The care and marketing of all florists' crops will also be considered. Assigned readings on these topics. Seniors. Lectures 2. Laboratory 4. Credit 4. Prerequisite, Floriculture 1 and 2. Associate Professor NEHRLING.

4. *Commercial Floriculture.* A continuation of Course 3. Seniors. Lectures 2. Laboratory 4. Credit 4. Prerequisites, Floriculture 1, 2, and 3. Associate Professor NEHRLING.

5. *Greenhouse Construction.* The design, construction, cost, maintenance, heating and ventilating of greenhouse structures. Also the drafting of specifications for commercial houses and private ranges. Should be taken with Floriculture 1. Juniors. Lectures 2. Laboratory 2 hours. Credit 3. Prerequisite, Horticulture 2. Associate Professor NEHRLING.

6. *Conservatory Work and Decorative Plants.* A study of the types of tropical and subtropical foliage and flowering plants used in conservatory work. The arrangement and care will also be considered. Assigned readings. Should be taken with Course 4. Arrange time. Lectures 2. Laboratory 2. Credit 3. Prerequisites, Floriculture 1, 2 and 3. Associate Professor NEHRLING.

7. *Garden Flowers and Bedding Plants.* The propagation and culture of annuals and herbaceous perennials, bulbs, etc. Also a detailed study of all bedding plants used in outdoor work. Seniors. Lectures 2. Laboratory, readings and field trips, 3 hours. Credit 3. Associate Professor NEHRLING.

8. *Seminar*. Advanced study of subjects pertaining to commercial floriculture or private garden work. All students electing this work will be assigned a specific problem and will pursue study in these problems by reading and research. No regular lectures will be given, but seminars will be conducted each week. A satisfactory report of the results must be presented. Designed only for seniors majoring in Floriculture. Not to exceed 3 credits.  
Associate Professor NEHLING.

### **POMOLOGY.** (Page 54.)

COURSE 5. In Pomology 5 the course will be changed from two lectures and the laboratory period to one lecture and two laboratory periods, the total credit of three remaining unchanged.

### **RURAL ENGINEERING.** (New Courses.)

COURSE 3. *Farm Structures*. Study of the strength, durability and cost of building materials; water supply; lighting and heating systems for the farm; drawing plans, writing specifications and estimating the cost of buildings. Concrete construction as applied to foundations, silos, tanks, posts, floors and walks. Elective, 1 lecture, 2 laboratory periods. Credit 3.

Associate Professor GUNNESS.

COURSE 4. *Farm Machinery*. Study of the care and operation of tillage, seeding, harvesting, pumping and spraying machinery; steam and gas engines. Special attention will be given to the use of power on the small farm. Practice in the adjustment of the various machines, babbitting and fitting bearings, lining shafts and pulleys, lacing belts, splicing rope, and packing valves. Elective, 1 lecture, two laboratory periods. Credit 3.

Associate Professor GUNNESS.

COURSE 5. *Power Machinery*. Steam and gasoline engines, refrigerating machinery, electric motors and dynamos. Practice in pipe fitting, soldering, babbitting and fitting bearings, lacing belts and packing valves. Elective, 1 lecture, 2 laboratory periods. Credit 3. Course 5 is intended primarily for dairy students but would be valuable to any man who would expect to use engines, pumps or electrical machinery.

Associate Professor GUNNESS.

COURSE 6. *Farm Mechanics*. A general study of the farm equipment; farm buildings, their location, plan and arrangement; water supply; sewage disposal; lighting and heating systems; farm power and farm machinery. Elective, 1 lecture, 2 laboratory periods. Credit 3.

Course 6 has been planned for the benefit of those students who want a general course in farm mechanics but cannot spend the time to take the two courses, 3 and 4.

Associate Professor GUNNESS.

### **RURAL SOCIOLOGY.** (Page 84.)

COURSE 4. The course formerly designated as Farm Law with a credit of but one hour will be substituted by a course in business and farm law with a credit of 3 hours, to be conducted by Professor HART.

### **ENGLISH.**

COURSES 7 AND 8. *Advanced Composition*. See Journalism 1 and 2, which take the place of English 7 and 8.

## MAJOR IN RURAL JOURNALISM.

Adviser: Associate Professor NEAL.

(For supplementary information, see the English Bulletin Board.)

1. *Foundations of writing: exposition.* Advanced composition; planning expository thought; expository structure; analysis of specimens, including contemporary articles from farm and rural-life publications, bulletins, etc.; some bulletin writing, including presentation of technical information for non-technical readers. Juniors (and Seniors.) Credit 3. Mr. PRINCE.

2. *Foundations of writing: narration and description.* The fundamental elements of style, word-choice, diction, sentence forms and paragraph types. Description of persons, places, objects, industries and productional processes, the temper and characteristic aspects of public gatherings, moods, behavior and character-sketching. Narration of incident, sustained action, events in series, and the like, as in biography, dramatic situation, history and fiction. Juniors (and Seniors.) Credit 3. Mr. PRINCE.

3, 4. *Newsgathering and news writing.* Foundation aims and conceptions of journalism. City and rural newspapers, class and trade journals, reviews, magazines. Journalistic style. Nature and tests of news; educational, industrial, agricultural, religious, technical, and general news; national, state, city, town, and country news. News values. Form of the news story; lead and feature; the body of the story. Stories not primarily news; feature and human-interest stories, etc. News sources; runs, assignments, special and country correspondents, systems of "raking." News in the home community; farm reporting; employment of news to develop home interests. Laboratory course. Juniors (and Seniors.) Credit 2.

Associate Professor NEAL.

5. *Desk editing.* Revision and rewriting; writing from another's notes; copy-reading, proof-reading, headline writing. Laboratory course. Seniors (and Juniors.) Credit 1. Associate Professor NEAL.

7, 8. *Editorial materials and methods.* Editing as interpretation and as executive direction; the urban, the agricultural, and the rural editor; relation of the rural editor to his community; editorial organization of the rural press. The business side of editing. The newspaper as a public utility; its relations to community welfare. Editorial subjects and writing; current events, sources of information about them, their local value and editorial treatment; rural topics, and their interpretation. The course calls for writing in the form of editorial comment upon current events and rural topics, with representative papers, periodicals, and farm journals as a source for models. Laboratory course. Seniors (and Juniors.) Credit 2.

Associate Professor NEAL.

9, 10. *Advanced journalistic practice.* Preparation, editing, and publication of a rural-life page or periodical. Students not majoring in journalism should consult the adviser before electing the work. Primarily a Senior course. Credit 3. Associate Professor NEAL.

*The remaining courses that are required in the major are:*

Economics and Sociology 1 (Political economy.) Credit 3.

Agricultural Economics 5 (Historical and comparative agriculture.) Credit 3.

Rural Sociology 1 (Rural community.) Credit 3.

# THE M. A. C. BULLETIN

## AMHERST, MASS.

Vol. VII. No. 2

February, 1915.

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Jan., Feb., Mar., May, Sept., Oct.

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No. 31

FIFTY-SECOND ANNUAL REPORT  
OF THE  
MASSACHUSETTS  
AGRICULTURAL COLLEGE.

PART I.

REPORT OF THE PRESIDENT AND OTHER OFFICERS  
OF ADMINISTRATION

FOR FISCAL YEAR ENDED NOV. 30, 1914.



BOSTON:  
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,  
32 DERNE STREET.

1915.





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FIFTY-SECOND ANNUAL REPORT  
OF THE  
MASSACHUSETTS  
AGRICULTURAL COLLEGE.

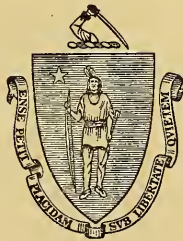
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PART I.

REPORT OF THE PRESIDENT AND OTHER OFFICERS OF ADMINISTRATION  
FOR FISCAL YEAR ENDED NOVEMBER 30, 1914.

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FEBRUARY, 1915.



BOSTON:  
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,  
32 DERNE STREET.  
1915.

APPROVED BY  
THE STATE BOARD OF PUBLICATION.

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## The Commonwealth of Massachusetts.

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MASSACHUSETTS AGRICULTURAL COLLEGE,  
AMHERST, Dec. 1, 1914.

To His Excellency DAVID I. WALSH.

SIR:— On behalf of the trustees of the Massachusetts Agricultural College I have the honor to transmit herewith, to Your Excellency and the Honorable Council, Part I. of the fifty-second annual report of the trustees, for the fiscal year ended Nov. 30, 1914, this being the report of the president of the college and other officers of administration to the corporation.

I am, very respectfully, your obedient servant,

KENYON L. BUTTERFIELD,  
*President.*



## REPORT OF THE PRESIDENT OF THE COLLEGE.

---

*Gentlemen of the Corporation.*

I herewith submit my annual report as president of the Massachusetts Agricultural College.

First of all, I wish to convey my hearty personal thanks to you as trustees for your generous action in allowing me a year's leave of absence which ended last May. For considerably over one-half of the period my services were given to the United States and American Commissions on Agricultural Credits, traveling with the commissions in Europe and assisting in the preparation of reports. The entire year was a fruitful one in the widening of observation, the enlarging of acquaintance, and the opportunity for study in fields fundamental to the development of large rural policies.

During my absence Prof. Edward M. Lewis served as acting president, not only with energy and efficiency, but with great acceptability to students, faculty and, I am quite sure, to your Board of Trustees. The position of acting president is never a sinecure, but Dean Lewis met every requirement with sympathy, skill, and thoroughgoing loyalty to the policies of the institution.

### **GENERAL REVIEW OF THE YEAR.**

DEAN MILLS.

The death of Prof. George Franklin Mills on Oct. 27, 1914, has taken from us an able member of our staff and a man whose long service, high character, and genuine friendliness had endeared him to all with whom he came in contact. Dean Mills had served the college for nearly twenty-five years, having joined the faculty early in January, 1890. For a large part of his career he was a teacher of English; for many years he was the faithful and hard-working treasurer of the institution; for seven years he was dean of the college. Last June he was made dean emeritus.

Perhaps the best tribute that can be offered, in this report, to the work and life of Dean Mills is to quote the resolutions passed by your Board of Trustees on Nov. 6, 1914: —

*Whereas*, The Board of Trustees of the Massachusetts Agricultural College is saddened by the death of its late dean, Prof. George F. Mills, and desires to give enduring expression to its appreciation of his high character and faithful services as an officer and instructor in the college;

*Resolved*, That by his death the college loses an invaluable officer who for twenty-four consecutive years has, with rare intelligence, fidelity, and unflinching courtesy, facilitated the success of the college, and the community loses a true gentleman and an exemplary citizen;

*Resolved*, That the trustees of the college commend the example presented by his long and honorable career to all who aspire to render unselfish and devoted service in educational work;

*Resolved*, That a copy of these resolutions be transmitted to the family of the late dean, to whom this Board extends its profound sympathy in their bereavement, and that a copy be placed on the records of the Board.

May I also add a personal word. I came to know Dean Mills quite intimately and felt his influence constantly, — indeed it is a perpetual possession. His loyalty to what he believed to be right, his conscientious performance of duty, his genuine interest in men, his chivalric attitude in all human relationships, his fortitude in illness and suffering were both a lesson and an inspiration. There is no greater tribute than to apply to him the old-fashioned phrase, “a Christian gentleman.”

#### MR. GEORGIA.

On May 24, 1914, Mr. Bert C. Georgia, the instructor in market gardening, died suddenly. Mr. Georgia had been with us only the year, coming from recent graduation at Cornell. His work was efficient, and his character and personality had already made a place for him in our ranks. His sad death at the threshold of what promised to be a fine career was a distinct shock and sorrow.

#### MAJOR ANDERSON.

In the death of Maj. John Anderson, which occurred Aug. 27, 1914, at his home in Belchertown, Mass., this college lost a true and loyal friend. Major Anderson served as professor of mili-



tary science and tactics at this institution from January, 1900, until September, 1905, and thoroughly won the love and respect of the students who during that period were privileged to know him. He was born in Monson, Mass., enlisted in the army in 1863, and was in active service during the rest of the civil war. At the close of the war he joined the regular army as second lieutenant, and worked his way up through the grades to the rank of major.

#### CHANGES IN TRUSTEES.

Owing to an appointment on another board, Hon. Charles E. Ward of your Board of Trustees resigned in August, 1914. Mr. Ward had rendered unusually efficient and intelligent service during his membership on the Board; his broad spirit, keen mind, and wide experience gave his service distinction. His successor, Mr. Edmund Mortimer, is a man of large affairs, great energy, and genuine interest in the work for which we stand.

#### RESIGNATION OF PROFESSOR EYERLY.

Prof. E. K. Eyerly, on September 1, resigned as head of the Department of Rural Sociology, to accept an important administrative and teaching position in the University of South Dakota. Professor Eyerly was released for this service, and his work is being carried on by other members of the department. Professor Eyerly was probably the first man in this country to organize and develop a district department of rural sociology. During his incumbency the interest and enrollment in the subject materially increased, and the type of work for which the department stands has found its place in the institution and among the students.

#### NEW PROFESSORIAL APPOINTMENTS.

Early in the year the vacancy caused by the resignation, in July, 1913, of Prof. E. A. White as head of the Department of Floriculture was filled by the appointment of Prof. A. H. Nehrling, who came to us from the University of Illinois. Professor Nehrling was educated in Washington University and the Shaw School of Botany, St. Louis, has served as an instructor in school gardening in South Chicago public schools

for three years, and for two years as an instructor in floriculture at the University of Illinois. At the time of leaving Illinois he was associate in floriculture in both the University and experiment station. Professor Nehrling has taken hold of this important department with energy and skill.

Prof. R. H. Ferguson was appointed to the position of extension professor of agricultural economics. Professor Ferguson was educated in the Christ Church Normal School, Belfast, Ire., and in Canterbury College, New Zealand. He is also a graduate of the Ontario Agricultural College and has taught in the State of New York. He has been assistant director of agricultural education in the Province of Ontario, and was county agent in the State of Virginia just before coming to Amherst. Professor Ferguson's work is to assist in the problem of the marketing and exchange of agricultural products and supplies. He is at the disposal of groups of farmers desiring a presentation of the principles of business co-operation, and, in general, of the exchange side of agriculture.

Prof. C. I. Gunness in July accepted the associate professorship of rural engineering. Professor Gunness graduated from the mechanical engineering department of the North Dakota Agricultural College in 1907, served for two years as instructor in mechanical engineering in that institution, and for three years as assistant professor. For the two years prior to his engagement here he was superintendent of the Indiana School of Tractioneering. He is a member of the American Society of Agricultural Engineers.

#### ATTENDANCE.

The total attendance of students registered in work of college grade is only slightly in excess of the enrollment of a year ago. The registration in the four undergraduate classes has decreased by 16, while the number of graduate students has increased by 13, and the number of unclassified students by 8. The total enrollment this year is 610 as compared with 605 last year. There was a noticeable decrease in the number of students entering the freshman class; for the past five or six years we have had an annual increase of from 15 to 20 in our entering class, or of approximately 8 per cent. over the preceding year;

this autumn, however, the entering class numbered 168, a decrease of 33, or 16 per cent. over the class entering in 1913. Thirty-two men were admitted to the freshman class who did not report. An investigation has been made among these men to ascertain their reason for not entering, and while there is no uniformity with respect to the nature of the replies, it is evident that a large number were prevented from entering on account of financial difficulties. (See Table V. for analysis of the enrollment.)

#### SHORT COURSES.

The usual winter and summer schools have been conducted during the past year with marked success. The registration in the ten weeks' winter course has in recent years increased constantly, so that in 1914 182 members were enrolled. The Farmers' Week was largely attended, the enrollment being between 1,500 and 1,700. The Summer School of Agriculture and Country Life was held in July, and had an attendance of 146. The Conference on Rural Community Planning, immediately following, enrolled 329. The boys' camps were this year even more successful than last. Although the weather was unfavorable at the time of the poultry convention in July, there was an attendance of over 600.

#### COMMENCEMENT.

The annual Commencement Day exercises were held Wednesday, June 17. The number receiving the degree of Bachelor of Science was 98, this class being slightly larger than that of 1913. The degree of Master of Science was conferred on 8, and the degree of Doctor of Philosophy on 3. The latter two facts are indicative of the increased attendance at this institution of men desiring advanced training in agriculture, horticulture, and the sciences relating thereto. The alumni dinner was attended by 189 alumni and officers of the college. Prof. Bliss Perry of Harvard University delivered the Commencement address, his subject being "The College and the Commonwealth."

## CHANGE IN COURSE OF STUDY.

After an extended discussion of the curriculum of the first two years, the faculty in the spring of 1914 adopted and presented to the trustees a revision of the course of study for this period. The changes made involve a reduction in required work in a modern language from three to two semesters, a study of agriculture and horticulture throughout the freshman and sophomore years, and a more even distribution of difficult subjects now required in the sophomore year. The plan also contemplates offering several electives in both semesters of the sophomore year, whereas at present only a comparatively few electives are available, and these only in the second semester.

The trustees at a recent meeting passed a resolution that "the faculty be requested to make a study, and to prepare a report thereon, of the entire curriculum with reference to its full adaptability to the training of students for the various agricultural vocations, and also in citizenship and in general culture." This resolution opens the way for a thoroughgoing study of the entire college curriculum from the standpoint of the main purpose of the college.

## LECTURES ON "WORLD POLITICS."

In the fall of 1913 the trustees established a permanent lectureship in world politics. At the close of the last fiscal year the first series of lectures on this subject was being delivered by Mr. R. L. Bridgman of Boston. The lectures were well attended, and excellent interest was shown by students and faculty in the specific lectures given, as well as in the general subject involved. This autumn (Oct. 21, 1914) Dr. Edwin D. Mead of the World Peace Foundation visited the college and delivered two lectures. The topic of the first was, "The United States and the United World," and of the second, "War and Peace in 1914." Dr. Mead had just returned from Europe and the seat of war, and made a particularly strong appeal to his audiences here.

## VISIT OF DR. SATO.

In March Dr. Shosuke Sato, the exchange lecturer from Japan to the United States, delivered at the college three lectures on the industrial, economic, and educational conditions in Japan. Dr. Sato's visit to this institution was of particular interest because of the fact that he is president of the University of Sapporo, Japan, which was founded by Dr. William S. Clark, for twelve years president of the Massachusetts Agricultural College. Dr. Sato was a student under both Dr. Brooks and Mr. William Wheeler of the trustees. The students and faculty gave Dr. Sato a cordial welcome, and his lectures were well attended and highly appreciated.

## CHINESE STUDENTS' CONFERENCE.

The eastern section of the Chinese Students' Alliance of America held its tenth annual convention at this institution Aug. 28 to Sept. 4, 1914. This meeting was significant, in part, because in the summer of 1905 there was held at this institution the first formal gathering of the Chinese students of America. At that time about 30 Chinese students met here for several days and organized the "Chinese Students' Alliance." The growth in numbers and influence of this organization has been phenomenal, and to-day approximately 1,000 Chinese students in various parts of the United States are members of the organization. Conferences are held annually in the western, central, and eastern sections of the country. Over 100 were in regular attendance at the Amherst conference this year. A well-organized program was arranged for each day, embodying talks on vocations, literary programs, athletics and other forms of amusements, business meetings, and public entertainments. The officers of the alliance were very appreciative of the courtesies extended by the college, and at the close of the conference the following resolution was adopted and presented to the president: —

In recognition of the kindness and hospitality on the part of President Butterfield and the authorities of the Massachusetts Agricultural College, be it resolved that a vote of thanks be tendered to the same authorities.

## SOCIAL SERVICE COMMISSION.

For three or four years there has been discussed among the students and faculty the desirability of securing a paid leader who should devote his time in developing, among the students, various lines of social service at the college, in Amherst, and in the surrounding towns. As a result of these discussions several men met in the spring of 1913 and organized what is known as the "Social Service Commission of the Massachusetts Agricultural College." The constitution adopted by this body follows:—

## ARTICLE I.

*Name.* — The name of this commission shall be the Social Service Commission of the Massachusetts Agricultural College.

## ARTICLE II.

*Object.* — The object of this commission shall be to use and train the students in social service, especially in rural social service in near-by communities, expecting —

First, the development in the students of leadership and Christian character.

Second, the use and co-operation of the various student and community organizations.

## ARTICLE III.

*Membership.* — The commission shall consist of nine members, the president of the college, and eight annually appointed by him from faculty, students, alumni, and the community at large; not more than three shall be appointed from the community at large.

## ARTICLE IV.

*Officers.* — The officers of this commission shall be a chairman and a clerk, both of whom shall be elected by ballot immediately after the appointment of the commission, and a treasurer, who shall be the treasurer of the college.

## ARTICLE V.

*Meetings and Duties.* — This commission shall meet at least twice each year. It shall have full charge and responsibility for raising and disbursing money, the employment of a social service secretary, and the directing of his work. At its meeting in September it shall outline its program of work for the ensuing college year.

## ARTICLE VI.

*Amendments.* — This constitution may be amended by two-thirds' vote of the commission, serving in any one year.

A canvass was made of the alumni for the purpose of securing financial support for this work, and as a result about \$1,000 a year for three years was pledged. A friend of the college interested in work of this kind pledged \$500 a year for three years.

In the summer of 1913 Mr. Elgin Sherk, a graduate of Syracuse University, and for some time secretary of the Syracuse University Y. M. C. A., was employed from funds thus secured by voluntary contribution. For over a year Mr. Sherk has been working among the college men organizing enterprises for social service, and in many other ways stimulating among the students a desire to become of service to their fellow men. Under his direction several classes of foreigners have been taught by our students in Three Rivers, Bondsville, and Thorndike. Several students also have charge of boys' clubs, and something has been done by the men in the way of conducting Bible classes in surrounding towns. Mr. Sherk has co-operated with the county work department of the State Y. M. C. A. in organizing religious work in some of the hill towns of western Massachusetts. Taken as a whole, Mr. Sherk and the work which he is undertaking has made a profound impression upon the students and upon the communities. It is hoped that in some way adequate financial provision may be made so that this work may be continued indefinitely.

## THE ATHLETIC FIELD.

In June, 1913, the trustees set aside approximately 7 acres of land belonging to the college for the purpose of athletics and delegated to the joint committee on athletics the right to control the same and develop it as an alumni field. At that time there were practically no funds available with which to improve the land; accordingly, in December, 1913, the athletic committee began an active campaign for funds with which to put the land in proper condition for athletic purposes. The total contributed

to date is approximately \$7,000, of which the alumni classes have paid about \$3,000, the undergraduate students \$2,000, the balance having come from friends of the institution and from profits of the college paper.

Work on the field was commenced in April, 1914, when the drainage system was put in. This work was practically all done by students free of cost; the students dug about 5,000 feet of ditch and laid the tile, thus underdraining all the lower portions of the field; the students also opened the brook on the east side of the area to insure an adequate outlet for the drainage system. It is estimated that the value of the work thus done by the students was at least \$1,000.

In May, bids were asked for the contract for grading the field, the specifications calling for the moving of 25,000 cubic yards of soil. The grading of the field was completed in September, and the whole area fertilized and seeded before the winter closed in. The total expenditures, including the contract for grading, the cost of tile, seed, engineering, etc., made a total of something over \$8,000. Several hundred dollars have been pledged, but not yet paid, and it is probable that within a few months the entire balance will be raised.

Thus the immediate need of the situation is met in a fairly satisfactory manner. However, it is still necessary to build a fence to enclose the field, and construct the running track and permanent stands for the seating of spectators. It is probable that the accomplishment of these projects will take some time, but the machinery is in operation which will doubtless bring the desired results within a reasonable period.

#### THE FRATERNITY HOUSE SITUATION.

For thirty years prior to 1908 there were four fraternities at the college. Since 1908, when the more rapid expansion of the college began, additional fraternal organizations have come into existence so that now there are nine fraternities and an organization of nonfraternity men, known as the "Commons Club." Of the nine fraternities, six are branches of national Greek letter organizations. Simultaneously with the growth in the number of fraternities and with the enlarged enrollment of the college, there has developed a tendency on the part of the fraternities to



obtain control of houses which may be used for rooming purposes. In 1908 one fraternity had a house; at present seven of the fraternities and the Commons Club either own or rent a house in the vicinity of the college campus. The Phi Sigma Kappa fraternity is just completing the first house designed and built primarily for the use of a fraternity, and on plans approved by the trustees of the college. This house is located on Pleasant Street at the south entrance to the college grounds, and is an attractive and serviceable addition to the campus.

#### CO-OPERATION WITH SPRINGFIELD Y. M. C. A. COLLEGE.

One of the marked developments in recent agricultural education is the training of men for special fields of service in the rural community. The Young Men's Christian Association has done particularly notable work in organizing its service for country and village boys and young men. This work is placed on the county basis, and the need for training these county secretaries has become pressing. To meet this need the Springfield Young Men's Christian Association Training College has inaugurated a course for rural work secretaries, and has sought the co-operation of our college, desiring that a part of the course shall be given here consisting largely of technical agriculture, agricultural economics, and rural sociology. Plans are under way for meeting this request and for eventually securing reciprocal exchanges of students of the two institutions.

#### LEGISLATIVE APPROPRIATIONS.

Inasmuch as the Legislature of 1913 established our income for current expenses covering a period of five years, no bill was presented to the Legislature of 1914 embodying requests for increased appropriations for these purposes. It is still necessary however, for the college to make annual requests for appropriations for new buildings and other special objects, and in 1914 three items were included in the budget: (a) agricultural building, including equipment, \$210,000; (b) student dormitory, \$35,000; (c) minor additions, \$10,000. The Legislature granted the appropriation of \$210,000 requested for the agricultural building. The contract for the construction of this building was let in midsummer, and the work is now well under way.

## EXCHANGE OF LAND.

The Legislature of 1913 passed an act authorizing the exchange of a portion of the college land acquired in 1910, and known as the "Louisa Baker Tract," and comprising about 12 acres, for 25 acres generally known as the "Owen land." The trustees, on November 6, voted to consummate the exchange, and the Governor and Council, on November 25, authorized the exchange. Steps are under way to carry out these instructions. The college will thus acquire an area admirably fitted for the development of the horticultural division, bounded on three sides by the college estate, and completing a compact area of horticultural land. The college parts with land well adapted to the construction of residences near the college grounds.

## IMPROVEMENTS, REPAIRS, AND CONSTRUCTION.

Improvements and repairs this year have not been quite so extensive as in the immediate past.

The new piggery has been completed at a cost of \$3,000, and another building, costing \$1,000, has been added to the equipment of the poultry department. Some new cinder walks have been constructed, but the need for further extension of both cinder and cement walks is very pressing. An extension to the president's house of the 6-inch water main has been completed, thus giving adequate fire protection and further water supply to the cold-storage building, as well as to the president's house.

Steam has been carried from the pit south of Clark Hall to the Phi Sigma Kappa fraternity house, an arrangement having been made with the fraternity corporation whereby the college will furnish steam and electricity for this building.

There have been made the usual repairs and minor improvements necessary to the proper upkeep of the college buildings.

*French Hall.* — During the year work on French Hall has been completed. This provides somewhat more than double the classroom capacity formerly available in this building. French Hall is now one of the most attractive buildings architecturally, and one of the most serviceable, on the campus.

*Infirmary.* — The Legislature of 1913 appropriated \$15,000 for the erection of an infirmary. For various reasons it was impossible to begin work on this building until the present fall. The plan finally decided upon includes one large building, with wards for patients and rooms for the matron and nurses, and a second building, designated as an "isolation ward." These buildings are heated and lighted from the central power plant. The plans embody the most modern ideas in hospital construction, arrangement, and convenience.

*Agricultural Building.* — The largest construction project undertaken during the year is that of the agricultural building and auditorium. When completed this will be the largest and most costly building on the grounds. The plans provide for a main building of three stories and basement, which will be devoted to offices, classrooms, and laboratories for practically all the departments in the Division of Agriculture, except that of dairying. It will be possible, also, to provide in this building for several other departments which at present are inadequately housed, both with respect to classroom facilities and office accommodations. In connection with this building there will be erected an auditorium, the seating capacity of which will be approximately 900; the auditorium will be used for general college exercises instead of the chapel, which has for several years been entirely inadequate for the demands made upon it. Shops for the Department of Rural Engineering are in process of construction.

Beginning on page 72 of this report will be found the following tables and statistics: —

- Table I. — New Appointments.
- Table II. — Resignations.
- Table III. — Change in Title of Officers of the Institution.
- Table IV. — Speakers for the Year.
- Table V. — Attendance.
- Table VI. — Legislative Budget.
- Table VII. — Statistics of the Freshman Class.
- Table VIII. — Entrance Statistics of the Freshman Class.
- Table IX. — Official Visits by Outside Organizations.

### IMMEDIATE NEEDS OF THE COLLEGE.

#### THE LEGISLATIVE BUDGET FOR 1915.

Your Board has already voted the following budget of special appropriations for presentation to the incoming Legislature:—

Addition to the power plant, . . . . .	\$30,000
Miscellaneous additions, . . . . .	10,000
Student dormitory, . . . . .	40,000
Laboratory for microbiology, . . . . .	67,500

Following is a statement of the reasons for these applications for legislative appropriations:—

#### *Addition to the Power Plant.*

The college power plant has reached its maximum capacity. At present it can furnish steam for about 55,000 feet of radiation. The new agricultural building, in which the radiation foots up to approximately 15,000 feet, will add nearly 25 per cent. to the demand upon the heating plant. The present plant consists of four boilers of 150 horse power each, with a storage capacity for 600 tons of coal. It will take another boiler to furnish steam for the new building, but this addition leaves no reserve in case of emergency, and it seems advisable to install two new boilers, each of 200 horse power, with space for two more boilers eventually. To make these additions there must be a new storage pocket, a coal trestle, and a new chimney. Thoroughgoing estimates made by the Stone & Webster Company call for \$33,200. We believe, however, that the changes can be made, by utilizing a good deal of our own labor, at a cost of \$30,000.

The absolute necessity of this enlargement of our central plant is obvious. The new agricultural building which will be ready for occupancy in September cannot be utilized unless we secure additional heating power.

#### *Miscellaneous Additions.*

The college has recently established a Department of Rural Engineering, intended to cover the field of farm mechanics, farm machinery, farm power, cement work, roads, farm build-

ings, public rural engineering, etc. This is a line of work that has long been needed, and of course requires shop facilities. We are able this year to make a start by constructing one-half of one unit of the proposed shops; next year we should complete this unit. It will take about \$2,500 for this purpose, and the final cost of the entire building will be about \$15,000. Appropriations for this, however, can come later. The appropriation is indispensable in the development of this new and important department. The balance of the sum of \$10,000 is needed for walks, refitting rooms in South College, and for installing a cold-storage plant in the dining hall.

#### *Student Dormitory.*

At present the college has dormitory facilities for about 70 students. The enrollment of students doing work of college grade exceeds 600. The demand for rooms in private houses has caused rentals at rates which in some cases are almost prohibitive to students, and particularly so to those students who are obliged to earn a part or all of their college expenses. The number of rooms within reasonable distance of the college, which may be secured at any price, is limited. It is uneconomical, from the standpoint of time, for a large number of students to live a mile or a mile and a half away from their college work. Furthermore, it is unsatisfactory from the standpoint of college discipline to have so large a percentage of students scattered over such a territory, as is necessary under existing circumstances.

The proposed dormitory, for which an appropriation has been asked for five successive years, will accommodate 50 men, and will be managed in such a way that students can secure good living accommodations at a comparatively reasonable cost. At the same time, the dormitory will yield to the college a fair financial return on the investment.

#### *Laboratory for Microbiology.*

Following are the essential reasons why a laboratory for the Department of Microbiology is a pressing need:—

1. At present there are no suitable facilities for giving instruction in this department to graduate and undergraduate students.

For a time the college has rented rooms over a mile from the college, and located in the center of the town, in order to make even inadequate provision for certain work of this department.

This is a comparatively new department, but represents one of the most important lines of agricultural science, and the enrollment in the courses is bound to grow rapidly.

2. Owing to the lack of proper accommodations it is impossible to carry on certain lines of laboratory and research work, such as, for example, investigations in milk, soil, and food microbiology.

3. A further handicap to satisfactory work is found in the fact that at present a room for the work is assigned in the dairy instruction building. Under these conditions it is impossible to work with any degree of freedom, because of the presence in the microbiological laboratory of obnoxious odors and the danger of introducing disease organisms into the dairy building.

4. The small amount of room now assigned to the Department of Microbiology is needed for the Department of Dairying, for which the building was originally designed and the demands of which are constantly increasing.

It seems unwise to build many small buildings, consequently the trustees have prepared plans for a building large enough to house not only the Department of Microbiology, but also the Department of Physics. This building when finally completed, it is estimated, will cost about \$160,000. The north end is to be used for microbiology, and for this we are asking \$67,500; this will enable us to house this department in good order. The building is to be fireproof, with two stories and a basement, and the appropriation includes proper equipment for teaching and research purposes.

#### THE GRAVES FOREST.

The Legislature of 1914 referred to the next General Court our request for an appropriation of \$30,000 for the purchase of a tract of land on Mt. Toby, owned by Mr. John L. Graves of Boston. The committee on agriculture, after visiting the land, expressed a cordial appreciation of the desirability of the tract for college purposes. I cannot urge too strongly the early granting of an appropriation for this purchase. This area of over 700 acres of beautiful forest, with trees of all ages and in wonderful

variety, including the summit as well as one of the slopes of perhaps the most interesting elevation in our valley, forms the ideal laboratory for our Department of Forestry. The tract should be scientifically treated as a forest, and thus would serve for generations not only as a demonstration in a business of increasing importance, but also as a perpetual public reservation.

#### CONTINUING APPROPRIATIONS FOR IMPROVEMENTS.

Two years ago the Legislature passed an act providing an annual income for the operation of the institution, increasing somewhat each year for a period of five years. This plan was developed under the initiative of the Commission on Economy and Efficiency, and at the outset it was believed that a similar arrangement could be made with regard to improvements. Certain matters, however, stood in the way at that time, and we are therefore still dependent upon special appropriations for the development of buildings and larger items for improvements and additions.

I wish to present for your consideration a plan for a fixed appropriation for improvements, including new buildings, sundry additions to the plant, new equipment, and land. Technical objections to this plan have, it is believed, been met in a bill drafted in consultation with the Attorney-General and the State Auditor.

The need for an enlarged income for additions to the physical plant at the college seems to us clearly obvious. Following is a provisional list of buildings and other improvements needed during the next decade, with conservative estimates of cost. Of course, we are assuming that the college is to grow during the next ten years, though perhaps not so rapidly as during the last ten years; but it seems wise to plan for at least a thousand students in the near future, and the equipment indicated is based on that figure:—

#### *A Six-year Plan.*

Complete rural engineering shop, . . . . .	\$15,000
Complete infirmary, . . . . .	15,000
Laboratory, physics and microbiology, . . . . .	160,000
Service building for pomology, . . . . .	28,000

Remodeling Stockbridge house and cottage, . . . . .	\$14,000
Student dormitory, . . . . .	40,000
Greenhouses, . . . . .	15,000
Library, . . . . .	250,000
Chemistry building, . . . . .	235,000
Armory and gymnasium, . . . . .	210,000
General improvements, . . . . .	90,000
New equipment, . . . . .	60,000
Land, . . . . .	30,000
Other buildings suggested by faculty to meet early needs: —	
Minor farm buildings, . . . . .	8,000
Instruction building for rural engineering, . . . . .	80,000
Building for poultry husbandry, . . . . .	80,000
Central building for administration, auditorium, and academic departments, . . . . .	300,000
New dining hall, . . . . .	200,000
Agricultural normal school, . . . . .	30,000
Dormitories for 1,000 students, . . . . .	800,000

There are many advantages accruing from a regular stated income for improvements. We can plan much more wisely than we can under the uncertainty arising from annual legislative action. Sometimes we are obliged to ask for buildings three or four years in succession, although the immediate need seems to us imperative. It is possible that when two buildings are requested we may be granted the building of lesser consequence. No doubt considerable economy can be effected by reducing winter work on buildings to a minimum. It is seldom possible to make contracts after the Legislature has adjourned, especially for large buildings, in time to permit contractors to house in the building before winter comes. Oftentimes departments are seriously handicapped because buildings are not completed at the opening of the college year, simply because we have not been able to start them in time. The State will be the gainer through this plan. Besides, if we are to maintain a first-class agricultural college we need a modern equipment and plant, well planned and consistently developed.



### OUR PRESENT TASK.

During the past fifteen years the college has expanded steadily and rather rapidly. Many new departments have been organized; new subjects of study have been placed in the curriculum; the attendance of students has increased sixfold since 1898, and has nearly trebled in eight years; we are rarely without building operations in progress; the extension work has grown from very small beginnings to large proportions; a business and administrative organization has been built up; there has been a notable increase of income. All of these developments have constituted an era of expansion.

It seems quite probable that the college will continue to grow, and that new needs in material ways will continue to arise, but it is not likely that the next few years will demand expansion in scope and equipment in the same ratio as in the past. Our main problem now seems to be to enter deliberately upon an era of consolidation; to study our purposes; to improve our methods; to adjust parts to one another and to the whole; to secure a larger measure of co-operation among all the factors; in fine, to perfect our organization.

If this policy be the correct one, it seems worth while to outline in this report some of those subproblems that are involved in the attempt to secure this more compact organization of the institution, in order that all of us may have at least a framework for our thinking and our planning.

I shall attempt nothing more at this time than to name the main problems as I conceive them, and as briefly as possible mark out or define each one. I may say that in nearly all instances there is under way a more or less well-developed plan for the consideration of these matters.

#### Problems of Undergraduate Teaching.

##### I. INSTRUCTION.

The good teacher is the bulwark of every college. There has been an evident check in the tendency of educational institutions, in judging the qualifications of teachers, to place the chief emphasis upon research ability. The true teacher must keep growing; and to keep growing he must investigate, as well as

profit by the results of the investigations of others. But the primary task of the teacher is to teach, and ability in research is not necessarily a test of ability in teaching. Consequently, teachers who can teach, who can inspire, who realize that they are teaching men rather than subjects, who have personality and character, enthusiasm and ideals, constitute the fundamental college need. Such men are sufficiently rare so that the economic law of supply and demand has a very definite meaning to the institutions seeking high-grade men. We must pay better salaries if we wish to keep our better men. Nor can we in Massachusetts avoid the reflection that our real competitors for the best men, at least in the technical subjects, are the strong agricultural colleges of the great agricultural States. It is doubtless true, also, that as a faculty we should give more attention to methods of instruction. It may be denied that there exists a well-established agricultural pedagogy, but it is well for us to consider with care whether we are using the best possible teaching methods.

## II. COURSES OF STUDY.

The recent vote of your Board of Trustees encourages the faculty to engage, in a most thoroughgoing way, in the task of discovering, if possible, a better curriculum than the present one, by which the purpose of the college may be carried out. The vote is as follows:—

That the faculty be requested to make a study, and to prepare a report thereon, of the entire curriculum, with reference to its full adaptability to the training of students for the various agricultural vocations, and also in citizenship and in general culture.

This vote in a sense outlines our problem. In a college devoted to the interests of agriculture it is evidently intended that the course shall be avowedly professional. We are set to the task of training men for following those vocations connected with agriculture and country life. But it would seem, also, to be the clear duty of a State-supported institution to fit its graduates to take their places in the common civic life. And, furthermore, from the standpoint of training good workers and good citizens, can we avoid an endeavor to bring our students to see

the meaning of the personal life itself, its real import, and how it may be worked out to a successful issue?

Our present course is somewhat of a mixture of the old insistence on formal discipline and a thorough study of the sciences, of mathematics, and modern languages as foundations for professional work, and the newer insistence on technical subject-matter and training. Our course is also, perhaps, a compromise between the emphasis on the professional aspect of education and on the so-called liberal aspect of education. But, however all this may be, there are some serious questions that must be answered. For example, we cannot ignore the present dissatisfaction that exists on the part of the high schools in respect to college entrance requirements. We must answer the question, Are our own entrance requirements too rigid and formal? The development of agriculture of secondary grade raises another specific question of entrance — namely, Shall we give credit for this type of agriculture? The whole question of content of the course of study is still being raised. What proportions of our course should be given to strictly technical work, to the formal sciences, to the humanities?

These, however, are really subsidiary questions. The main problem is to discover, if possible, how we can organize a four-years course of study which will best train men and women for the various agricultural vocations, and, at the same time, give them some grasp upon the nature and scope of the problems which they must face both as citizens and as human beings desiring the largest possible development of mental and spiritual capacity.

### III. QUALITY OF SCHOLARSHIP.

It is often asserted that the vocational or professional institution secures more thorough work from its students than is the case with the liberal arts colleges, on account of the interest aroused by the so-called utilitarian subjects. This is not necessarily true. I am sure that in our own institution the quality standards are not yet sufficiently high. There are many men, particularly in the upper years, who do not exert their energies to the fullest degree in classroom work; and of course the habit of doing less than one's best is absolutely fatal in developing maximum efficiency.

I wish it might be possible for us to have a closer oversight of the study-work of our students during the entire college course. We can never go back to the close supervision of the students exercised by the colleges of a century or a half century ago. But I think we have gone too far in adopting the German university method of letting the student work out his own salvation, particularly with the under classmen. The organization of a better method of supervision will undoubtedly require some money and the ability to command the services of men especially adapted to this sort of work. Our aim for quality of scholarship must not be quixotic. It must not exclude the faithful student of mediocre talent. Ideally, it will mean getting out of each student the best of which he is capable.

#### IV. STUDENT LIFE AND ACTIVITIES.

This question is one of the most puzzling problems of our American college life. The so-called "student activities" have grown up, for the most part, without faculty initiative, sometimes with faculty opposition, and rarely with faculty oversight and approval. But they have worked themselves into the structure of college life. They have a distinct educational value because they encourage initiative, inventiveness, responsibility, and leadership. Our problem is how to adjust these activities to class work so that they may supplement rather than controvert the main objects of the institution, and may contribute both to the student's efficiency and character; and how to maintain freedom of student initiative and management and still such measure of faculty oversight that these activities become organic in the college scheme of training.

#### V. PHYSICAL TRAINING OF STUDENTS.

The American college has accepted the responsibility for the physical welfare of its students, but it has not developed the proper machinery for realizing the results of this responsibility. The fault is not wholly that of the college. The college student is boy turning into man. He still has the play instinct; but unfortunately he is often led astray by the romance of the splendid contests of highly trained representatives of his devotion to play. The ideal is that every man should himself partic-

ipate; he should constantly play the out-of-door games, and, if possible, such games as he can carry through life. Right teaching as to diet, temperance, personal purity are also part of our obligation to the student. In the last few years we have made substantial headway in this matter, but are not yet satisfied.

## VI. THE HOUSING AND FEEDING OF STUDENTS.

In many colleges this question is entirely ignored by the college authorities. I question whether it ought to be ignored by any college. Under our present conditions we could not ignore it if we would. These conditions are unsatisfactory in many ways. The rooms occupied by the students are scattered over the village. There is no supervision. We have no assurance that the students are living under proper sanitary conditions; although it is only fair to say that the impression prevails that these conditions are satisfactory both physically and morally. But the present responsibility of the situation lies with the citizens of Amherst and with our students, rather than with the college authorities, because of the lack of any intelligent direction or supervision. The board at the dining hall seems to be satisfactory on the whole. But there are many questions that continue to arise. For example, shall we have a dormitory system? If so, how shall we get these dormitories, and how manage them? If we do not adopt a dormitory system, how may students be assured rooms, sanitary, properly conducted, at reasonable prices? It is highly desirable that the college itself should furnish board at cost, and should relate the management of the dining hall to the question of proper dietary habits on the part of the students. There is more or less self-boarding among the students who have to earn their own way. Nothing but praise should be given a man who does this, but there is a serious question whether such sacrifices are not actually deleterious in the long run.

## VII. CHARACTER BUILDING AS A SPECIAL ENDEAVOR.

It is sometimes said that the main object of schools and colleges is character building. Of course the main object of life is character building. The man who seeks the highest ends, either

consciously or unconsciously, makes all his experience minister to character building in himself and in others. But it is hardly correct to say that the objective of college work is character building in the sense of an immediate and special end.

But if character building may not be regarded as the immediate objective, it ought to play its true part; in other words, college courses and college life ought to minister at every point to the largest life of the man; so that every college that is true to its work has the task of so organizing itself that the student may not only have an opportunity to gain a broad view of the fundamental problems of life, but also have an opportunity for forming the best personal habits and for rendering some form of community service. In all this work a State institution must sedulously guard itself against infringing religious liberty or stirring religious prejudice.

### **Problems of Advanced and Special Study.**

#### **VIII. THE GRADUATE SCHOOL.**

The college has recognized the dearth of thoroughly trained men for investigation, for teaching, and for expert service in agriculture and country life fields, by establishing a graduate school which now has an enrollment of over 50. But we still have many questions to face, such, for example, as the extent to which the graduate work shall be developed, the degrees to be offered, the relationship to undergraduate work, our ability to finance probable developments, the provision of teachers, and the correlation of research with graduate study. The report of the director (page 50) furnishes an admirable outline of the present organization and of some of our problems.

#### **IX. SCHOOL FOR RURAL SOCIAL SERVICE.**

Future leadership in agriculture and country life lies not only with men and women who are experts, or investigators, or teachers in the field of technical agriculture and the sciences underlying it, but equally with those men and women who design to become leaders or experts — in local community, in the State, in the nation — in the realms of rural education, rural politics, or rural organization. The agricultural colleges

are already contributing, and are destined to contribute even more completely, to the training of teachers in secondary agricultural schools, of country clergymen, of rural Y. M. C. A. secretaries, of rural librarians, of grange workers, and of other leaders in the country-life movement. It is worth our while to ask if this field is not extensive enough to warrant the organization on our campus of what is practically a School of Rural Social Service. It is quite possible that such an enterprise can come to its fullness only with private endowment supplementing the efforts that we find practicable as a State institution.

#### X. THE TRAINING OF WOMEN FOR AGRICULTURE AND RURAL HOME LIFE.

There is a new demand upon the part of young women for participating with men in the training for the agricultural vocations. So far we have not met this call in any adequate way. We can hardly neglect for long this increasingly important and reasonable demand. But this is not the only phase of the relationship of the college to the needs of women. Heretofore the movement for better agricultural education has not given sufficient attention to the rural home. Successful departments of domestic science have been instituted in many of the land-grant colleges, and these departments are doing notable work. In popular agricultural education, that is, through farmers' institutes and extension service, a great deal has been done on behalf of the country home. But we have yet to meet the problem in its full need. In the last analysis woman's status on the farm and the quality of the home life in the country, are the determining factors of a permanent rural civilization. It would seem, therefore, that such attention should be given to the problems of the rural home as is given to the problems of the farm itself. I hope, therefore, that we may consider the organization on our campus of courses that shall form virtually a Woman's College of Agriculture and Rural Home Life. I do not wish to raise the issue of coeducation, and it is not necessary, for the device of an affiliated woman's college has proved workable in other New England colleges.

**Problems involved in Agricultural Investigation.****XI. DEVELOPMENT OF RESEARCH WORK.**

The need of continued and thorough investigation of the main elements of the agricultural problem requires no elaboration. Research is fundamental to fresh teaching. Indeed, it is fundamental to the complete development of the college as the servant of the agricultural interests of the Commonwealth. The field of research broadens as we appreciate more completely the scope of the rural problem, and the possibilities lying before an educational institution in helping to solve that problem. The vital element in planning this task of investigation, which includes both thoroughgoing scientific research and practical tests and experiments, is to determine the problems of agriculture and country life that most need attention. The eyes of every investigator should be on this issue. Investigation, no matter how interesting for the individual investigator, should square with the most significant needs of the people who till the soil.

Up to the present time, research and experiment in our agricultural colleges, as developed through the work of the experiment station, has been largely in connection with the study of the soil, and the plant, and the animal — their characteristics, the laws that operate in their utilization, and their interrelationships. Soil fertility, the relation of crops and soil to climate, improvement of soils, improvement of crops and animals, and better feeding and care; protection from diseases and pests; and greater facility in the use of natural powers — these have been the field of research. There is still illimitable opportunity and need for sound work here. We have found, however, that our rural problem is not only a question of improving the farm, but also of improving the business and even the life of the community. If we are to fulfill our mission, therefore, we must also undertake thoroughgoing studies of farm management, and of those conditions in the economic and business world that affect the farmers' welfare, such as the securing of sufficient capital, more effective methods of purchase, more satisfactory methods of sale, and, in general, the attainment of a clearer understanding of the economic affairs with which the farmer must deal. But there are also social forces which affect very



materially both his business and his welfare. Therefore the conditions under which he works and lives, his home life, his community life, his education — all need the study of the trained mind.

We face, therefore, the problem of a rather wide extension of the field of agricultural research, simply because we have come to realize that the physical and biological forces with which the farmer deals constitute after all only a part of his problem. The economic and social forces are equally compelling in the development of his business.

## XII. AN AGRICULTURAL SURVEY.

The extension of the field of agricultural research just referred to suggests a specialized phase of investigation which is now seen to be of the utmost importance. For want of a better name we call it "an agricultural survey." In general research and experimentation we have to do with fundamental forces and principles. An agricultural survey takes into account actual conditions which the working farmer has to meet on his own farm. This distinction between the two types of investigation is not quite so sharp as might appear at first; but, in general, it will serve as a definition. A closer study of soils and climate and other physical factors, with reference to their adaptability to certain types of farming; the study of transportation and markets; the facts in regard to cost of production and cost of distribution are illustrative of this phase of investigation. We already have under way a considerable amount of work in this field, especially in the subject of farm management in co-operation with the United States Department of Agriculture. But we cannot expect Massachusetts agriculture to develop as rapidly as it may until we can furnish farmers with exact facts concerning the conditions under which they actually have to operate their business.

### **Problems of the Extension Service.**

## XIII. EXTENSION TEACHING.

It is unnecessary to dwell upon the importance of extension teaching in agriculture. Not only has our own policy become thoroughly established, but we have developed an organization

and a method that I think will bear comparison with that of any agricultural college in the country. More than that, the whole movement for extension teaching has been given a new impetus by the passage of the Smith-Lever act of 1914. This act as certainly the most stupendous and, I believe, the most significant and statesmanlike piece of legislation of its kind ever enacted. It means the nationalization of popular agricultural education. If all the States comply with its requirements the income from both State and national treasuries will eventually be the equivalent of 4 per cent. interest on an endowment of \$200,000,000. Massachusetts does not get its full share of this fund because of our small "rural population." Our own problems, however, are sufficiently difficult and important. We should study our administrative organization, our types of work, our methods of teaching, etc. Extension work is confessedly young. In a sense, we have been experimenting. These subjects should receive as much attention during the next few years as any other phase of institutional work. I should like to call attention to the recommendations of the Director of the Extension Service in another part of this report (page 61), and especially to urge careful consideration of our relation to the so-called "county-agent" work.

It is clear that all this work will require larger funds than the State is at present appropriating. We must be cautious, of course, not to advocate extravagant expenditures for this line of work; but, on the other hand, we must not fail to make it clear that if wisely used the cost of an efficient extension service is not a tax but an investment.

#### XIV. THE PLACE OF THE COLLEGE IN RURAL ORGANIZATION.

During the last few years we have made great strides in our conception of the rural problem and how to meet it. We have discovered, for example, that this problem is both broad and complicated. As Sir Horace Plunkett, the great Irish leader, so happily expresses it, we need "better farming, better business, better living." And not only have we learned to look upon the rural question as a unit, but we have learned that we must attack it in its entirety. We must correlate the work of institutions, we must prevent overlapping, waste of effort due to duplication,

and friction that sometimes arise in the conflicts of institutional interests. In other words, we should have a rural policy for community, for State, and even for the nation as a whole. This policy involves a study of the larger phases of the rural problem, a division of labor among institutions and organizations, a correlation of effort on the part of all agencies interested, and consequently a complete rural organization.

Our own college is participating in a movement of this sort which is still in a formative stage, and which yet bears the marks of a comprehensive attempt at securing a rural policy. We are assisting communities to make plans for community development; we are participating in the Massachusetts Federation for Rural Progress, which aims to correlate all rural activities; we are assisting in the establishment of county improvement bureaus. All these efforts involve us inextricably in the problem of general rural organization. We must establish our proper relationships with other institutions and agencies. We have made progress in this direction in recent years, but the whole matter still constitutes an important problem.

### **Problems of General Administration.**

#### **XV. THE ADMINISTRATIVE ORGANIZATION OF THE INSTITUTION.**

In this day of demand for efficiency, and in this country of administrative skill in business, it is easy for an educational institution to overorganize itself, or to attempt unwisely to transfer administrative schemes successful in business to the college campus where they may have no place. On the other hand, in avoiding "red tape" there is a temptation to neglect proper administrative organization, especially in the smaller institutions, thereby losing headway and energy.

The principles of good administrative organization for a college would seem to include, among other things, a clear definition of the function of the various administrative elements, such as trustees, faculty, administrative officers; the formulation of adequate codes of by-laws for the trustees and the faculty; the centralizing of administrative responsibility in a few hands; well-recognized committee responsibility both in trustees and faculty; democratic methods of establishing policies; the develop-

ment of standard efficiency tests; a simple but thorough system of reports; the reduction of rules and formulas to the lowest possible terms.

#### XVI. BUSINESS ORGANIZATION AND EFFICIENCY.

There can be no question about the responsibility that rests upon every member of the staff of this institution to utilize the really liberal funds which the Commonwealth has granted for our use in a way to make every dollar count to the fullest. Here, also, there is a need for some standard tests of efficiency, but these tests are difficult to make. The business man can test the use of his money by money results; but the last thing that accrues from the use of money in an educational institution is more money. The business question that we confront is not greater profit, but simply the wisest possible use—wise not in terms of money results, but in terms of effective teaching, of useful investigation, of helpful extension service. It is not easy to formulate the ideal plan of business organization. The terms of employment, the supervision of the purely business aspects of the institution, the best methods of apportioning funds, complete but simple reports of the use of funds, the increasingly important question of clerical help, the relation of the institution to members of its staff with respect to professional improvements, attendance at important meetings, etc., are all pressing questions.

We have developed a very complete system of bookkeeping at the college, but it is a question whether any educational institution has yet developed an adequate system of accounting. Most of the attempts that have been made to establish a satisfactory scheme for cost accounting when applied to an educational institution merely emphasize the difficulties involved. It would hardly seem that the problem is an insoluble one. At any rate, it is our duty to seek a solution.

#### XVII. SECURING AND MAINTAINING AN ADEQUATE PHYSICAL PLANT.

A college does not consist of brick and mortar. But it is a mere platitude to say that if a college is to do its best work it must be properly housed. We must develop an adequate physi-

cal plant to house our various departments, so arranged that it conforms to accepted principles of landscape gardening and architecture, and secures a maximum of convenience and permanence. The problem of the character of buildings is also involved. The best methods of planning them and erecting them, the question of types of buildings — whether fireproof or not — the matter of care, repairs, janitor service, fire protection, are all important. It is impossible to lay out a building program for any appreciable term of years. A great deal depends upon the growth of the college in students. Much depends, also, upon the adjustment from time to time of departmental work, the institution of new departments, etc. I have outlined elsewhere in this report the early needs of our plant on the physical side, so far as I can foresee them. Tentative plans have already been prepared for some of these buildings.

#### XVIII. PUBLICITY.

The time for advertising a college like ours has gone by; that is, advertising in the commercial sense of the word. There is no dearth of students, and the best advertising is the work we do and the men we graduate. But in my opinion it is our duty to develop a system of publicity for the institution that gives, through the newspapers, through public lectures, and through special publications, an adequate idea of the service which the institution is rendering, and can render, to the people of the Commonwealth. The motive of merely advertising ourselves may be honestly disavowed, for a State-supported college should help the people of the State to understand and utilize the opportunities which the college offers to those who need its help. It is a strange fact that to-day, with such publicity as has already been given to the college, there are thousands of people in Massachusetts who do not know to what extent the college can help them, nor how to obtain the information they want.

#### XIX. ADEQUATE FINANCIAL SUPPORT.

The question of financial support for this institution may be put in an interrogative sentence: Is the Commonwealth of Massachusetts willing to make appropriations sufficient to sup-

port a *first-class* agricultural college? Without question the people are willing to support a *good* agricultural college. The Legislature during recent years has increased our appropriations generously. Assuming that we are administering wisely the funds intrusted to our care, the question still arises, To what degree can we count upon further support? The question involved is not merely that of the willingness of the people to make larger appropriations; it is also a question of the ability of the State to sustain all of its public institutions in proper fashion, and at the same time adequately to support a first-class agricultural college.

I take the liberty of quoting from my inaugural address, made eight years ago, a few sentences covering this question:—

To carry out the forward movement in agricultural education much larger appropriations of money than are now available must be granted by the State. Indeed, this is, on the practical side, the prime question that confronts agricultural education. Thoroughly trained investigators are not common, but they can be had; there will be no lack of attendance at agricultural colleges; there is no inherent difficulty in interesting farmers in extension work. In fact, the forward movement in agricultural education in most States of the Union now waits very largely upon one consideration—adequate appropriations. The difficulty of the problem before the Massachusetts Agricultural College is measured, I take it, very largely by the degree to which the public sentiment of this Commonwealth, as expressed through the Legislature, will stand sponsor for a program that attempts to forward in the most thorough way the vital rural interests of the State.

I still maintain this position. And in this connection I ought to say that I do not believe that the Massachusetts Agricultural College should attempt to emphasize all the lines of work that are developed in western agricultural colleges. There are two things essential to the maintenance of an agricultural college of the first rank in this State. The first essential is to cover those subjects of study and investigation that are most intimately related to the fundamental agricultural and country-life problems of the Commonwealth. The second is to maintain high grade quality of research and teaching in those lines that we do attempt. Now the agricultural field, even in Massachusetts, is broadening very rapidly. Efficiency costs, in college teaching and

research as well as in business, and the people of the Commonwealth ought to know that if we are to continue to have an agricultural college of the first rank, it will take a great deal more money each year than is now being appropriated for our use.

I am inclined to the view that we must look for private endowment to supplement appropriations of public money. For example, take the matter of dormitories. College students cannot be housed in good dormitories at a cost much less than \$800 per capita. This is lower than most eastern colleges allow. Suppose we take the lower figure: assuming an attendance of 1,200 students at this institution by the end of another decade, it would cost nearly \$1,000,000 to house them in dormitories. If we had no other demands, possibly the State would be willing to spend money for this purpose. Doubtless the State is willing to do something, but I believe that private funds must come to our aid if we are to develop a complete dormitory system. There are other needs. In the west there has been a marked tendency in recent years for individuals to give large gifts or to leave large legacies to State institutions; it is not so customary in the east. Yet with the new interest of business men in agriculture and their realization of the importance of training a fine body of rural leaders, I venture to hope that we may expect substantial aid from private sources.

## XX. ESPRIT DE CORPS.

In one sense this is our crowning problem. How shall we secure such a spirit in a large body of men employed at an institution of education that they shall work together intimately and sympathetically, co-operate for the best interests of the institution as a whole, subordinate departmental pride and personal ambitions? Great results are possible even though the administrative and business organization be defective. But on the other hand, no matter how fully the machinery for administration and organization be elaborated, unless there is the spirit of the whole body — the spirit of co-operation, the spirit of fraternity — no administrative scheme will work to advantage. We have here, in common with other institutions, the problem of the development of an *esprit de corps* among the faculty

and students, in their relations one to the other and in their relations to the trustees, the alumni and the public, that shall make the institution notable for the co-operative spirit.

#### IN CONCLUSION.

I have stated a number of our problems without attempting to offer much in the way of an indication of their solution. I have merely tried to place before you an outline of our present task as I see it.

If during the next few years we can succeed in studying with some degree of thoroughness each one of these twenty problems; if we can in each case define the central aim and purpose, gain a clear-cut idea of present deficiencies, agree on principles of reconstruction, and put into operation a few practical methods, we shall have accomplished a great and enduring work. If I might be permitted a bit of sentiment and the announcement of a slogan, it would be to suggest "Massachusetts Agricultural College, 1920," with the hope that by that year we may have made reasonable progress toward the solution of these significant college problems.

KENYON L. BUTTERFIELD,

*President.*



## REPORTS OF OTHER ADMINISTRATIVE OFFICERS.

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### IN THE DEPARTMENTS OF INSTRUCTION.

#### The Dean.

On account of my duties as acting president the bulk of the work in the dean's office this year fell upon Dean Mills and Miss Christiansen, most of it necessarily upon the latter. I gave a few days now and then to disentangling some of the more difficult questions. Dean Mills was not strong; consequently, he limited himself in the main to applications for absences from the regular college exercises. The work of handling students deficient in scholarship was in part carried by the chairmen of the freshmen and sophomore teachers' meetings. During the last two months, on account of my absence from college, Professor Mackimmie shared with Miss Christiansen the duties of the office.

EDWARD M. LEWIS,

*Dean.*

#### Division of Agriculture.

During the year there has been an increasing demand for the work of the members of the division, both from students and the people of the State. The appropriation made by the last Legislature for an agricultural building is an indication of this demand, as well as of the desire properly to house and equip the departments that deal so directly with technical agriculture. This spirit is further shown by gifts of valuable young pure-bred animals from several Guernsey, Jersey, and Berkshire breeders. These are valuable additions to our teaching equipment in animal husbandry, and are much appreciated.

The Department of Rural Engineering has been established during the year and fills a long-felt want. An additional instructor in dairying and a graduate assistant in animal hus-

bandry have been added to the staff. A veterinarian from the Bureau of Animal Industry, United States Department of Agriculture, has also been detailed for work in hog cholera prevention in the State, and will make his headquarters with the Animal Husbandry Department. On the college farm a small but well-equipped piggery and a silo at the young stock barn have been built.

Among the important and pressing needs of the division is a small appropriation for the completion of the rural engineering shops; also land fairly accessible to the college for the experimental work in poultry husbandry, and within driving distance for pasturage for young stock. Modern tools for demonstration on the college farm are also urgently needed; the college should lead and not follow in this respect.

Among the problems needing solution, the question of farm practice for our students should be mentioned. The last annual report of the college shows that while agriculture or horticulture is the intended vocation of over 80 per cent. of the entering class (1916), only 24 per cent. of the class were brought up on a farm, and only 61 per cent. had had any farm experience. This is a condition that needs careful attention if all our graduates are to gain and hold the confidence of their associates in the communities to which they go.

Another matter needing attention very soon is the proper correlation of the teaching and research work. Every department of the division should be devoting some attention to research work, and be prepared to investigate the many new problems that are being continually presented to us and which are still awaiting solution.

J. A. FOORD,  
*Head of the Division.*

#### **Division of Horticulture.**

No changes of special importance have been made in the organization or policies of the Division of Horticulture. The work has grown in volume and has been strengthened at various points. The sudden death of Mr. Georgia left the work in market gardening disorganized, and has made necessary the temporary suspension of one of the courses in market gardening. The

completion of French Hall has added greatly to our facilities, especially in providing room for market gardening and forestry.

There are many pressing needs in the Division of Horticulture, and it is hard to make a list of those which should be particularly emphasized. At the present moment the following seem to me the most important: (1) a small laboratory for the Department of Pomology, to house the work in manufacturing and to provide a laboratory for rough work in spraying; (2) an additional high-grade instructor to take the courses in general horticulture; (3) an adequate tract of forest land for the Department of Forestry; (4) the reorganization of the market-gardening work in a large way; (5) additional greenhouses.

The most serious problem which we have to meet is that of adjusting our instruction in technical subjects to the awkward college calendar. This matter has been mentioned under this same heading in previous reports. It would seem now that the college is in a position to make a change in its calendar, whereby instruction can be given throughout the year. If this change is reasonably well managed it will result in great good to the instruction in several technical lines. The instruction in technical or professional lines needs constant and thoroughgoing improvement. This is a matter which has received quite insufficient study in the past.

F. A. WAUGH,  
*Head of the Division.*

#### **Division of Science.**

Reports from the eight departments which comprise this division indicate that in nearly all of these larger classes are being taught than last year. Some changes and revisions of courses have been made to advantage, and the routine work has progressed, as a whole, in a satisfactory way.

As a result of the increase in size of the classes it has become more difficult to give them proper attention, particularly in laboratory work; and this condition, if continued, must result in more assistance, and, in some cases, an increase in the amount of funds available to supply the added equipment and material.

The fundamental problem in chemistry appears to be how to obtain the larger accommodations necessary for the best work.

In botany a better co-ordination of the courses is desirable. In entomology the problem of new courses is being studied, in order that undergraduate students may receive instruction comparable with that offered elsewhere in amount and range. At present several more subjects should be offered by the department if it is to compare with other places to advantage. In microbiology the need for adequate and properly equipped accommodations is the most pressing problem. A "laboratory where the simplest microbiological matters to the most complex can be taught and demonstrated" is much needed.

The real problem confronting all departments, not only of this division but throughout the college, is that of improving the attitude of the student to his work. The average student seemingly entirely fails to realize that any work on his part will be needed in order to support himself after graduation, and therefore he also fails to realize that here is the place to equip himself so that he will be most efficient later. When a student can be taught to realize the severity of the struggle for existence and that the man most adequately prepared is the one who will win, he will begin to take a college course more seriously and equip himself better for the struggle to follow.

H. T. FERNALD,

*Chairman of the Division.*

#### **Division of the Humanities.**

*Progress.* — 1. There has been some increase in the number of students electing the strong courses in the division, due apparently to the improvement of the work.

2. The concentration of more instructors and classes of the division in French Hall, where the head of the division can keep in closer touch with the work, is a decided benefit.

3. The rearrangements in the department of English which were put into effect this year are all beneficial to that work, bringing about greater satisfaction to instructors, better team work for the department, and closer adherence to the schedule.

Now that Dean Lewis has been made permanent head of the department we can make more progress away from the confu-

sion of the past. His genius as an instructor in literature should be used in the department to the fullest extent of his time.

4. Professor Smith got good results from his work with the debating teams last spring, and he is now working on broader lines for the development of more debating material. The general problem of debating in the Massachusetts Agricultural College has not yet been solved, and we should watch Professor Smith's efforts with interest, and be ready to give assistance or make reforms on the basis of his experience.

5. Miss Jefferson's course in the history of New England seems to have aroused the enthusiasm of the instructor and the interest of the student. She will evidently "make good" in this, and is already advocating an extension of the work over two semesters. I think that one semester is sufficient for it at present.

*Immediate Needs.* — 1. Concentration of the instructors of the division within one building or one part of the campus as soon as possible, and the permanent location of each department in order that material may be collected and construction carried out for more efficient teaching.

2. New courses recommended: (a) Constitutional Government; (b) Local Government; (c) Philosophical and Religious Ideals; (d) Business Law and Administration.

The past experience of the division with the courses in history and government show that only first-class men should try to teach these courses, which most of the students ought to take, but which must compete in election with the vocational lines of work.

*General Problems.* — 1. To develop "better quality" of work rather than to extend the quantity and number of courses.

2. To build up an atmosphere of scholarship and academic interest within the division and college.

ROBERT J. SPRAGUE,

*Head of the Division.*

#### **Division of Rural Social Science.**

There have been no radical changes in the work of this division. Professor Eyerly's resignation has somewhat broken up the work of the Department of Rural Sociology, but three grad-

uate students, Mr. Russell F. Lund, Mr. Carl J. Strand, and Mr. Charles G. Baird, have carried on certain courses with enthusiasm and skill.

The extension service for boys and girls in the Department of Agricultural Education has grown to enormous proportions under the immediate supervision of Professor Morton, as will be shown by the report of the director of the extension service.

Prof. E. L. Morgan, in his work in stimulating and directing the rural community-building movement, is doing what I regard as perhaps the most significant constructive rural work that is being undertaken in this or in any other country. The rural community must eventually be the unit of rural development. I regard it as a great privilege that our institution should be foremost in recognizing and developing this fundamental principle.

KENYON L. BUTTERFIELD,

*Head of the Division.*

### **General Departments reporting to the President.**

#### **MILITARY DEPARTMENT.**

Capt. George C. Martin reports as follows: —

At the present time and during the past year the regiment has been divided into two battalions of four companies each and band. The companies average about 50 men. During the year all members of the three lower classes have drilled, and 15 members of the senior class, a total of 429.

The general instructions from the War Department have been fully complied with. Three hours of practical work per week during the drill period is required of all students in the department. In addition to this, work in theory is required of the sophomore and freshmen classes for one hour each week during the scholastic year.

Also during the year the professor of military science and tactics has given lectures on such subjects as — Military Instruction in Colleges, Infantry Training, Military Courtesy, the Flag, Patriotism, and Military Policy of the United States.

Great interest is taken in rifle practice. The indoor rifle team won second place in this year's match. This was the greatest year for indoor shooting since the starting of the inter-

collegiate matches. Intercollegiate records were broken several times during the season both by Michigan, the winner, and by this college. That we lost the championship, due to the splendid shooting done by Michigan, does not decrease the interest in indoor shooting. This was shown by the students when they requested the Athletic Board to make indoor shooting part of the class sports for the sophomore and freshman classes, and the winning class will be granted their class numerals.

On the outdoor range this college won the championship from the strong Naval Academy team, both teams beating the intercollegiate record.

An encampment of a week or ten days is one of the greatest needs of the department. A new armory is badly needed; the present one is inadequate in every way for the number of students under instruction. There is a dangerous crush on the dismissal from drill, when the students are in a hurry to put up their arms.

Fifteen men were reported to the adjutant-general of the army and to the Adjutant-General of the Commonwealth of Massachusetts for special aptitude in the military service. The best 7 were recommended for commissions in the United States army.

The equipment of the department is of the best and in fine condition. The spirit of the young men is of the best, and many take great interest in the work of the department. The discipline of the regiment is excellent.

An additional short outdoor range is greatly needed. This should be near the college. As it is now, Saturday is the only day when students can get a chance to practice on the outdoor range, on account of the distance from the college, — about  $2\frac{1}{2}$  miles. If there were a 200-yard range near the college it would materially increase the interest in outdoor shooting, and consequently the number of men to qualify as expert riflemen, sharpshooters, and marksmen would be greatly increased.

The indoor range is inadequate for the number of men who wish to participate in the indoor shooting. It will only accommodate 4 men at a time. At any time in the afternoon during the last month there have been from 2 to 10 men waiting their turn in the gallery.

## DEPARTMENT OF PHYSICAL EDUCATION AND HYGIENE.

Professor Hicks reports as follows:—

The work of the department has been conducted during the past year along the following lines:—

1. The entering class of men were each given a physical examination during the first month of the college year, thus reducing the possibility of any injury arising from ignorance of their own condition. In the examination especial care is taken to detect any defects of the vital organs, sight, and hearing. Each person is given a short talk, following his examination, concerning his condition, the kind of exercise he should have, and the proper care of his body.

2. The freshman class is given a course of lectures and written quizzes on personal hygiene during the first semester.

3. The department during the past three years has been gradually increasing its service to students suffering from minor injuries or illness, advising calling of a physician when necessary, and seeing that ill or injured students are properly cared for. This work has developed until nearly every case of illness in the college is handled through the office of the physical director; we have estimated that during the past year more than 500 cases have received first-aid treatment in the department, and over 100 calls have been made on ill or injured students at their rooms, to see that they are properly cared for and given such assistance as is necessary. We believe that by reaching these men in this way many cases, which have been previously neglected until serious, are now taken care of without any, or at most very little loss of time to the student. The possibility of any contagious disease becoming widespread before detection is also greatly reduced. In this work the department has been constantly in touch with the department of microbiology, through the health committee of the college.

4. During the winter months the department requires three hours of physical exercise per week of each member of the three lower classes. Those men who have been found by examination to be physically normal are permitted to elect one of the several athletic activities; those who have been found to be below normal physically are given individual instruction. Walking trips may be substituted for physical exercise in the gymnasium



and during the past year about 150 students elected this form of exercise. The work of the indoor classes of from 30 to 40 men each consists of gymnastic exercises and such games as basketball and indoor baseball.

The physical director is general manager of athletics, supervising the arrangements for contests with other colleges, buying the supplies for the teams, assisting in the coaching, and having final control of the players and games.

The interest in intercollegiate and intramural athletic activities has been steadily growing. An accurate estimate of the participation in all sports during the year shows that in track 55 men participated; cross country, 25; hockey, 75; baseball (including interfraternity), 175; tennis, 25; football, 90; and basketball (other than required gymnasium), 40. After counting out duplications we find that approximately 45 per cent. of the student body voluntarily took part in some form of supervised athletic sport during the year.

The limited quarters in which the regular gymnasium work is to be carried on during the winter season make it impossible to do indoor gymnastics which compare in anywise favorably with that of other colleges. From December 1 to the coming of spring the drill hall floor is in use until 9 o'clock every night. The need of a larger gymnasium with proper bathing facilities is great.

#### LIBRARY.

Mr. Green reports as follows: —

The very pressing need for a new library building overshadows every library activity, and influences, without question, the work of a good many of the departments in the institution. The lack of adequate accommodations for library workers is so evident that teachers and students alike are discouraged from making good use of our equipment. Lack of room for the proper accommodation of book material debars us from obtaining and making easily available good material which we ought to have on hand. Worse than our poor working accommodations or the impoverished book collection, is the serious absence of a fine library atmosphere — that intangible something so earnestly desired, and which would mean so much to those of our people desiring to use the college library.

There have been 3,337 volumes added during the year, making a total of 44,406 in the college library, 14,197, or nearly 33 per cent. of the books in the library, having been added during the past six years. The work of recataloguing the library continues as rapidly as possible, and is indicated by the new card catalogue in the process of making, which contains 61,413 cards for the 21,587 volumes recatalogued, and the 10,824 new volumes catalogued since this work began in April, 1910.

The regular library extension work in lending books on agriculture and related subjects to the small public libraries in the State continues, and has been supplemented by the publication of eight library leaflets on beekeeping, live stock, forestry, civic improvement, flower gardening, co-operative associations, marketing farm products, and farm and garden papers. Our records show that 760 books and 241 bulletins were loaned out during the past year to 42 borrowing libraries in the State.

### **Director of the Graduate School.**

#### ORGANIZATION OF THE GRADUATE SCHOOL.

##### *General.*

The organization is based upon —

1. The recognition of the department as the unit.
2. The qualified individual instructor or instructors within the department as the directive agents.
3. The apprenticeship system of instruction; that is, the clustering of one, two or three graduate students about every qualified instructor in the department and in the college for intimate study and experience.

##### *Organization.*

4. A committee, consisting of the instructor having the major subject of the graduate student as chairman, and such a number, as may be determined by the director, of the instructors having the minor or minors or supporting courses of the graduate student as associates shall be appointed to advise the student, supervise and control his work, subject to the approval of the "graduate staff."

5. The assignment of a graduate student to an instructor shall be left with the director and head of the department in which he elects his major courses.

6. Should a graduate student be admitted as a candidate for no degree and fail to designate a major course, the director shall appoint a committee to act in the same capacity and to have the same power as if a major and minor had been chosen.

7. The "staff of the graduate school," or the "graduate staff," shall consist of the president of the college, the director of the graduate school, and the instructors who are chairmen of graduate students' committees, or who are in immediate charge of major subjects or courses, and the chairmen of those committees supervising graduate students' work, not candidates for a degree, subject to the approval of the director and president.

8. The staff of the graduate school shall be directly responsible to the president and Board of Trustees, except in those matters which the president may deem desirable to treat conjointly with other staffs and faculties, as general policies, before submitting them to the Board of Trustees.

#### *Some Essential Details and Policies.*

9. Because of the possible value of the work of graduate students to the State, it is urged that no tuition be charged, whether acting as graduate assistants or not. Further, that unless laboratory fees are such as arise in connection with undergraduate subjects, which are outside of major and minor subjects, they also will be remitted.

10. The number of graduate assistants shall be increased to that point where the educational work of the college or the investigations of the station will not be injured.

11. It is urged that the departmental courses of study for graduate work be left with the staff, subject to the approval of the Board of Trustees as formerly.

12. Major and minor courses leading to the degrees of Master of Agriculture and Doctor of Agriculture, or such specific degrees as may hereinafter be determined, shall be formulated in the practical departments of the college. In these courses basic systematic work in the sciences and practices, along with actual technical experience, shall be the distinctive purpose. Proficiency in practice shall be the highest ideal. The formulation of such courses shall emanate from the various technical departments, shall possess uniform requirements and standards, and

shall be submitted to the graduate staff for action, which in turn will transmit them to the Board of Trustees for approval.

13. Since exchange with other institutions is highly beneficial to graduate students, it shall be the duty of the director and staff to foster it in those cases where it is pertinent and valuable so far as is compatible with the interests of our own institution. In case a graduate student cannot secure at this institution what is essential to his work and training, it shall be the duty of the director and staff to arrange for such elsewhere.

14. Every graduate student must satisfy the graduate staff with a certain amount of practical agricultural knowledge and training, the amount, kind and quality to be determined by the staff.

#### *Immediate Needs.*

The most pressing needs of the graduate school are, in general, better facilities and equipment in conducting work of the highest grade. In some instances this lack of equipment is in the direction of the number of highly trained men to give the desired instruction. In other cases the lack is in proper laboratory equipment. Some of the departments are already adequately equipped to carry on work of the proper standard, and an excellent start has been made by them in placing this institution in the forefront with respect to scientific training along certain lines. The number of men that we try to train, however, should not exceed our ability to do our best work in securing the desired results.

#### *Fundamental Problems.*

Some of the fundamental problems which are at present most noticeable are: (a) A clarifying of the atmosphere as to what is agricultural research, graduate and undergraduate instruction, agricultural extension. (b) A development of a real, basis spirit of agricultural research, instruction, and extension as distinct from and in connection with the popular exhortation; in other words, we should not lose sight of the structure from which we unfurl our flag. (c) A possible confluent policy by which graduate theses may be strengthened by experiment station support with graduate requirements.

CHARLES E. MARSHALL,  
*Director of the Graduate School.*

### Supervisor of Short Courses.

All of the short courses given in previous years, except bee-keeping, with some additions, have been held during 1914, increased popularity and enrollment being shown. In fact, the registration in short courses has reached the point where the facilities of the college and satisfactory living accommodations in the village are overtaxed, and careful, immediate consideration must be given to the problems arising from the continually increasing attendance at these courses.

We have had the hearty co-operation of several State and national organizations in arranging programs. Among them are: —

- Massachusetts Board of Education.
- Massachusetts Civic League.
- Massachusetts State Grange.
- State Board of Health.
- Massachusetts Free Public Library Commission.
- Massachusetts Federation of Churches.
- State Forester.
- Massachusetts Forestry Commission.
- State Board of Agriculture.
- Massachusetts Dairymen's Association.

In the near future it is planned to arrange short courses of three or four days in length at the college for such groups as feed dealers, fertilizer agents, milk inspectors, seed dealers, town officers, boards of health, and others whom the college may serve. Programs have been prepared and dates have been set for meetings for feed dealers and property assessors during the coming winter.

Following are some of the problems concerning short courses which I desire to present to you and the trustees for early consideration: —

1. Inasmuch as the college is receiving an increased appropriation each year, and since the short courses are to be considered as a part of the teaching of the college, the cost of maintaining them should be borne by the college. With a stationary appropriation for the next four years it will not be possible to take care of increased enrollment from extension funds. The need of larger appropriations for the summer school and Farmers' Week is especially imperative.

2. We must consider at once the necessity of limiting registration, especially in the ten weeks' courses, or else providing additional instructors in several departments in order to give satisfactory instruction. Since there are large numbers of mature people in the State who want this kind of work, and through the short courses the college has the opportunity to render a distinct service to them, it would be rather unfortunate to deprive these persons of the chance to enroll.

3. The time has come when we should consider the question of enlarging and extending the short courses to cover a period of two and possibly three winters. Those who enter these courses are of various ages, training, and experience. Many are graduates of the best universities of the country; others have had scarcely a grammar school training. It is extremely hard to teach such a cosmopolitan group. This plan would involve considerable addition to the teaching force and laboratory equipment, but would be well worth considering.

4. The directors of county schools of agriculture and the teachers of agriculture in vocational schools have made the request that the college take the students from the last year in these schools into our short courses for special training in dairying, fruit growing, and other subjects. This seems a very natural and proper thing to do, and furnishes the desired articulation between these schools and the college. In four or five years such students will be coming to us in large numbers. If a sufficient teaching force and laboratory equipment are not furnished here at the college, each county school and many towns will be forced to spend large sums of money to equip dairy plants and other branches. It seems to the supervisor that for many reasons every effort should be made to take care of these students.

5. A faculty committee on appointments, to take care of applications for farm superintendents and others, would be most helpful in placing short-course students in desirable positions.

The short courses, reaching as they do more than 3,000 earnest people each year, are well worthy of more careful study, planning and more financial support than we have been giving them during recent years.

WILLIAM D. HURD,  
*Supervisor of Short Courses.*

**DIRECTOR OF THE EXPERIMENT STATION.**

## STAFF.

The experiment station has been fortunate in experiencing but very few changes in staff during the year, and those affecting only one or two minor positions. The staff has been distinctly strengthened by the appointment of Mr. Orton L. Clark to a position in the Department of Plant-Physiology and Pathology.

## PUBLICATION.

The law affecting publication of the reports and results of station work has been amended during the past year. The amended law brings the method of publication into conformity with that recommended by the Association of American Agricultural Colleges and Experiment Stations, and at the same time the new method secures a number of other important advantages: —

1. Results are published promptly in bulletin form instead of being held until the end of the year.

2. As each bulletin is bound by itself it can be circulated with greater economy, being sent only to those especially interested in the subject-matter.

3. The new method avoids sending reports and bulletins in duplicate to individuals whose names are included in the mailing lists both of the station and the State Board of Agriculture, as must frequently have been done under the old law.

4. Under the new law the cost of publication of bulletins is borne by the State instead of being provided for from the general funds of the station.

5. While securing all these advantages and relieving station funds, as indicated under paragraph 4, the cost to the State is materially lessened under the new plan of publication. The saving during the past year has amounted to about \$1,000.

*Bulletins.*

Eight bulletins have been issued during the year, as follows: —

No. 148. Diagnosis of Infection with *Bacterium Pullorum* (white diarrhoea) in the Domestic Fowl.

No. 149. A Study of Variation in Apples.

No. 150. Reports on Experimental Work in Connection with Cranberries.

- No. 151. The Determination of Acetyl Number (Fat Analysis).
- No. 152. The Digestibility of Cattle Foods.
- No. 153. A Summary of Meteorological Records.
- No. 154. Alfalfa.
- No. 155. New Fertilizer Materials and By-products.

The meteorological summary covers twenty-five years of our own observations, and in addition includes observations on temperature and rainfall from 1836 to 1888 (when observations at this station began), which were begun by the late Professor Snell of Amherst College and continued by his daughters. The records thus brought together cover so long a period of time as to make them of very great value for purposes of reference and comparison.

The bulletin on diagnosis of white diarrhoea describes a method whereby fowls which will produce eggs that will hatch into chickens which will become subject to the disease can be detected by a simple test and removed from the flock. The practical test of the method shows it to be, practically speaking, infallible, and in one flock in which it has been tried upon an extensive scale, where losses previous to the introduction of the test included about 2,000 chickens, the loss was reduced to practically nothing.

The bulletin on alfalfa presents a concise account of our long-continued experiments with this crop, and based upon the discussion of these results, conclusions and advice of much practical importance are presented.

The annual bulletin on cranberry work is eagerly looked forward to by practically all growers, who show the keenest interest in the conclusions of Dr. Franklin, and recognize the great value of advice based upon the results of his investigations.

#### STATION PLOTS.

During the past year a considerable number of station plots have been taken as sites for buildings, thus greatly reducing our possibilities in a number of important lines of investigation. Closely connected with this should be mentioned the increasing difficulty of avoiding trespass on other plots, due to the tendency of students to take direct lines in passing from building to building.



### EXTENSION WORK.

The station is still doing a large amount of work which really belongs to the extension service. Every department calls attention to the large number of letters of advice required. In addition, a large amount of time is consumed in diagnosing the causes of injury to crops and the diseases of animals. Work of this kind is highly appreciated and should be continued, but attention is called to the fact that much of it is not investigational in character.

### SEED SEPARATION AND EXAMINATION.

The demands for work of this character have increased materially, and it requires a large amount of time. It is useful work, but is more or less routine in its character, and, except in so far as may be necessary for the purpose of inventing or perfecting methods, is foreign to the work of an experiment station. Seedsmen in increasing numbers are sending large amounts of seeds to the station to be freed from impurities and separated into different grades. This work is clearly outside the province of the experiment station and a change in policy is imperative.

### PRESSING NEEDS.

The most immediate pressing need of the experiment station is more land. I believe that on this point all departments, even those not depending very directly upon the use of land, are in full agreement. The reasons why more land is essential are in part indicated by my statement of what has happened to a number of station plots during the past year. I have made so full a statement of the reasons why more land is needed in the experiment station in my last annual report that I beg leave to refer to my discussion of the land question in that report, which begins on page 11a.

Other special considerations affecting the question of the need of more land are connected with the continuance and development of the work of the Poultry Department. A considerable area to provide for the permanent accommodation of the poultry plant should be secured in the near future, but Professor Graham urges the necessity for the immediate provision of some

three or four acres. He regards this as absolutely essential on account of the fact that the land now occupied is infected with serious diseases which cannot be entirely held in check under existing conditions.

The Poultry Department strongly urges the provision at as early a day as possible of a poultry house in which the environmental conditions can be controlled, this house to be used in the principal line of investigation now in progress. Dr. Goodale points out that the variation in the character of the weather of different years is so great that rigid scientific deductions are impossible when laying fowls are kept in houses of ordinary construction. He points out that satisfactory comparisons between parents and their offspring in successive years are impossible unless conditions be controlled. Since additional room to accommodate the experimental work is an immediate necessity, it would seem to be the part of wisdom to ask for an appropriation sufficiently large to build a house of the character indicated.

In the Department of Meteorology there are two needs which should be met as soon as practicable:—

1. The provision of an automatic rain gauge to insure greater accuracy in the records of precipitation, especially in winter.
2. A safe to contain the records of the department.

#### *Additional Assistants.*

Both the Poultry and the Veterinary departments urge the desirability of an additional assistant. Professor Graham believes he should have a man capable of diagnosing and studying poultry diseases, and if he has such a man he must have also a laboratory and laboratory equipment for pathological work. A considerable share of the time of such a man would be used in examining diseased specimens and answering letters of inquiry pertaining to diseases and their treatment sent to the department.

Dr. Paige of the Veterinary Department strongly urges the desirability of a man qualified to do similar work on live-stock diseases in general. He mentions particularly that there is a demand for the complement fixation test for the diagnosis of contagious abortion in cattle — a demand which cannot be met under present conditions. There can be no doubt that great

service could be rendered to the dairy men of the State if this diagnostic work could be carried out here, as it would constitute a most effective preliminary to the eradication of contagious abortion, now the occasion of enormous annual loss, from our dairy herds. Dr. Paige believes that such an assistant would be able, also, to continue such work as Dr. Gage has carried out on the premises of one of our largest poultry keepers for the diagnosis and consequent prevention of white diarrhoea of fowls — also the occasion of immense annual loss. Dr. Paige believes that such a man would be able to do the work needed in the Poultry Department, and in this belief I concur. I would urge the employment as soon as possible of a single qualified man for the lines of work just mentioned, and such others related to them as his time will allow. It seems to me clear that all work connected with animal pathology should be done in one department, and that the department best fitted to handle it is the Veterinary Department. The employment of a single man rather than two is in line with the policy of maintaining departmental integrity. It is also the course dictated by considerations of business efficiency and economy. The necessary laboratory and equipment for pathological work are found in the Veterinary Department. No considerable additional investment will be required for the additional work in that department, whereas if a pathologist for work in the Poultry Department is to be employed there must be a large expenditure for laboratory and equipment. Dr. Paige suggests that a graduate student might be able to do the class of work under consideration, and I would urge the employment of such a man as soon as a suitable person can be found.

I would, however, in this connection point out that the services to be rendered by such a man are in very considerable measure of the nature of extension rather than experiment, and it would seem to me that the salary of such an assistant should be divided between the extension service and the experiment station.

*Plant Pathologist.*

Dr. Stone and Professor Osmun concur in thinking that an assistant should be employed, especially for diagnostic work in the Department of Plant Physiology and Pathology. There

is a large number of specimens annually sent in to the department. The examination of these, and the diagnosis of the cause of the trouble complained of, require a large expenditure of time, and in many cases a satisfactory explanation of the cause of the trouble, and advice relative to its prevention or cure, cannot be given until an examination on the spot has been made. It is not practicable for either of the assistants now employed to make the necessary trips and spend the amount of time desirable for this line of work, and the best way of providing for it would seem to be the employment of a careful and reliable observer, who should make the necessary trips, investigate conditions, and collect and send material for examination to the department. There is a somewhat insistent demand on the part especially of market gardeners, and those employed in the production of hothouse specialties, that a substation to work in their interests should be established. The establishment of such a station and its maintenance would require the expenditure of relatively large sums of money. The equipment essential for diagnostic work now exists in the department. To duplicate it at another station seems quite unnecessary, as diseased material can readily be sent to the home station. It seems, therefore, that a man, who should spend a considerable share of his time during the growing season of our great truck and hothouse specialties among the growers, going wherever trouble was being experienced to investigate conditions and collect and forward material, would be by far the most economical and at the same time effective means of meeting the needs of the important classes of agricultural specialists referred to. I would, therefore, urge that a man qualified for this kind of work be employed as early as possible.

#### *Salaries.*

Another pressing need is that the salaries of the experiment station staff shall be carefully correlated with those of members of the college staff in other divisions and departments. The salaries in the station are at present in many cases below the institutional standard. It is felt that this condition, which is of course highly unsatisfactory, should be corrected before the scope of the station investigations should be greatly extended.

It further seems highly important that the basis for division of salaries between the station and other departments of the institution should be readjusted to more nearly conform to that of time spent on the part of individuals working in more than one department.

WILLIAM P. BROOKS,

*Director.*

### **DIRECTOR OF THE EXTENSION SERVICE.**

In attempting to render an adequate report of the work of the extension service one faces a discouraging task. A written report may cover bare facts and give statistics, but the spirit which permeates all true extension teaching cannot be represented in a report of this kind. In this connection I desire to commend especially all members of the extension service staff, and many members of the teaching and experimental staffs of the college and station, for their loyalty to and enthusiasm for the work, and for the genuine interest which they have shown in attempting to make themselves and their work helpful to the rural interests of the Commonwealth.

#### **A. GENERAL ADMINISTRATION.**

##### *1. Principal Lines of Endeavor for the Year.*

The administration of the extension work of the college during the past year has been directed along the following lines: (a) an attempt to perfect the organization of an extension service within the college itself, which would be efficient and work harmoniously in the already established plan of organization; (b) the further organization of work already under way rather than the starting of new lines of work; (c) the consummation of the plan proposed about three years ago for co-operative work between the State Board of Education, through county schools of agriculture and departments of agriculture in high schools, the United States Department of Agriculture, and the college; (d) an effort to get farm bureaus and the work of county agents organized in this State on the same plan as has been adopted in other States; (e) working out plans for satisfactory relationships between the United States Department of

Agriculture and the college in the expenditure of co-operative demonstration funds; (f) the working out of plans for the administration of the Lever bill funds, so that they would be of greatest benefit to the State and would meet with the approval of the authorities at Washington.

### 2. *Changes in Staff and Additions.*

Fortunately for the work there have been no resignations or changes in the staff during the past year.

### 3. *Printing and Publications.*

During the year bulletins and circulars of each of the short-course activities have been published. Thirteen numbers of "Facts for Farmers" have been issued. Several have gone into reprints for wider distribution by different organizations. Twenty thousand extra copies of "Redirection of the Rural School" were printed for the United States Bureau of Education. The North Packing Company printed 20,000 of our bulletins on "Swine Feeding" for distribution. For use in the boys' and girls' club work a general bulletin and five primers have been issued. Besides the above there have been large numbers of record blanks, library leaflets, announcement cards, etc. News letters have been sent to the press weekly.

### 4. *Correspondence Courses.*

The correspondence courses have been reorganized during the year. There has been a total registration of 1,059. New courses in home economics and rural sociology have been offered. The courses in soils, fertilizers, dairying, feeding, and fruit growing have been rewritten. Better "follow-up" and instructional methods are being practiced.

### 5. *Itinerant Instruction.*

(a) *Extension Schools.* — The extension schools continue to be the best things offered away from the college. Ten agricultural extension schools, two in community development, and one special school in fruit growing have been held during the year.

(b) *Lectures.* — More than the usual number of lectures have been given by the college faculty this year. Four towns adopted the plan of having courses. At the present time a course of forty-five lectures is being given under the auspices of the Boston Chamber of Commerce, with an enrollment of more than 900. A course in gardening and club work is being given for the Boston Board of Education to 75 picked leaders from the different districts of that city. The college, the Federation of Women's Clubs, and the grange have co-operated in offering a free course of five lectures on home economics during the coming winter to all small communities that desire it.

(c) *Exhibits.* — Educational exhibits, supplemented by lectures and demonstrations, have been made at ten fairs. Two special exhibits were provided for other organizations.

#### 6. *The Massachusetts Agricultural College Agricultural Improvement Association.*

The work of this association has continued along the lines of corn, potato, and pasture improvement. One session during Farmers' Week was under the auspices of this organization. The membership now numbers over 250.

#### 7. *Demonstration Auto Truck.*

The demonstration auto truck, with Mr. McDougall as the very efficient demonstrator in charge, continues to be perhaps our best means of getting into intimate touch with farmers. During the year he has given 77 demonstrations, has made 418 farm visits, and spent from two days to a week in each of 68 towns. Mr. McDougall spent three months during the winter assisting in pomology and farm management work.

#### 8. *Home Economics.*

As might have been expected when this work for women was started, those in charge have been in much demand by various organizations in the State. A large number of lectures and demonstrations have been given. Work for women of the same extent as for men has been given in all extension schools. One separate extension school on homemaking has been held in

Woods Hole. Girls' home economics clubs and a correspondence course have been started. The co-operation of the Federation of Women's Clubs and the grange has been enlisted in an effort to give a course of five lectures in a large number of small towns under our management during the coming year.

### 9. *Farm Bureaus and County Agents.*

(a) *Hampden County.* — The extension service has continued its active relationships in the management of the work of the Hampden County Improvement League during the year. Much progress has been made, under the instruction of advisers of the league, in better cropping systems, dairy and orchard management, buying (coöperatively) lime, fertilizers, feeds and apple barrels, selling fruit, and in the development of work for young people within the county.

(b) *Worcester County.* — A farm bureau was organized in this county in March, 1914, but was inactive until November 10, when Charles H. White (Massachusetts Agricultural College, 1909) was engaged as its agent. He is just entering on his duties, and is depending on the college largely for direction of the work.

(c) *Other Counties.* — Franklin and Hampshire counties have already organized farm bureaus, but have not as yet engaged county agents. Plymouth is in process of organization, and others have the matter under consideration.

### 10. *Demonstration Farms.*

(a) *Barnstable County.* — The Faunce Demonstration Farm at Sandwich continues to be a matter of inspiration, and serves as the center for the dissemination of agricultural information for the people of that region. A plot of ground of less than 8 acres has yielded more than \$1,600 worth of poultry, small fruits, and vegetables during the year. Mr. L. B. Boston, the superintendent, spends a goodly portion of his time as adviser to farmers and district agent for the college.

(b) *The Paige Farm.* — The Paige Demonstration Farm at Hardwick is now under the advisory direction of the college. Mr. Robert D. Lull (Massachusetts Agricultural College, 1911), the superintendent, is proving a very efficient leader in the com-



munity, and besides managing the farm and the farmers' exchange, is also active in the program of work for community development started in the town two years ago.

### 11. *Co-operative Work.*

(a) *The United States Department of Agriculture.* — The college now has with the United States Department of Agriculture a general memorandum of understanding under which all the work of the department within the State is to be done. Under this memorandum the director of the extension service becomes the State leader for the United States Department of Agriculture, and arranges and directs the work. At the present time the United States Department of Agriculture is co-operating in helping to pay the salaries and expenses of Prof. O. A. Morton and Miss Nash in boys' and girls' club work, Professor Ferguson for milk distribution work, Mr. Baker and Mr. Ellis for farm management studies, an appropriation of \$1,200 for county work in each of two counties, all of the salary and expenses of Dr. D. I. Skidmore in hog cholera demonstrations, also co-operating in some pasture demonstration work, and giving some money for supervision and "follow-up" work in tabulating farm records, and boys' and girls' club work.

(b) *State Board of Education.* — The plans considered for the past three years of having teachers of agriculture in vocational schools and county schools of agriculture work under the direction of the college in so far as they deal with adult farmers has been consummated during the year. Co-operative agreements now exist between the Board of Education, the United States Department of Agriculture, and the college. Thirteen teachers in vocational schools, and representatives in the two county schools of agriculture and the Smith's Agricultural School, now act as extension representatives. This plan insures the same types of extension teachings and demonstrations being carried on all over the State, and looks toward economy, efficiency, and harmony in our administration. A special school of instruction for these men, lasting one week, was held at the college last February, and they also attended the summer conference.

(c) *Other Organizations within the State.* — The extension service has continued its policy of attempting to utilize existing.

organizations within the State for its work rather than the creation of new machinery. Organized pieces of work have been carried out with the State Board of Agriculture, the Grange, the State Board of Health, the Massachusetts Civic League, the State Forester, the Federation of Women's Clubs, the Board of Education, the New England Home Economics Association, the Massachusetts Forestry Association, the fairs of the State, the Federation of Churches, city and county Y. M. C. A.'s, boards of trade, and many local and town organizations.

### 12. *The Smith-Lever Bill.*

In May, 1914, Congress passed the Smith-Lever bill, giving an initial appropriation of \$10,000 to the State for demonstration work in agriculture and home economics. Plans were at once made to receive the benefits of the appropriation. Projects were submitted to Washington and were approved. At the present time these funds are being applied toward the support of demonstration work already started in fruit growing, animal husbandry, boys' and girls' clubs, dairying, demonstration auto truck, home economics, farm management, and the printing of practical bulletins and leaflets.

## B. EXTENSION WORK THROUGH DEPARTMENTS AND EXTENSION SPECIALISTS.

### 1. *Pomology.*

At the present time we have nineteen demonstration orchards in different sections of the State. One extension school in fruit growing was held during the year. A large number of single lectures, demonstrations, and farm visits were given and assistance was rendered at fruit shows, fairs, etc.

### 2. *Animal Husbandry.*

During the year Mr. George F. Story was transferred from the Dairy to the Animal Husbandry Department. The organization of Dairy Improvement and Breeding Associations has been encouraged. The Fall River milk campaign, started three years ago, has been continued. Fourteen stock-judging contests for boys have been held in which 234 participated. The usual number of lectures and demonstrations have been given.

### 3. *Boys' and Girls' Club Work.*

Of all lines of work this is no doubt the most far-reaching and significant. More than 42,000 boys and girls have been enrolled during the year. Clubs have been organized in over 250 towns. The work now covers corn, potatoes, gardening, home economics, poultry, and canning. Six boys and one girl made the trip to Washington. Seven of the winners in potato contests took the trip to Aroostook County, Me. Three spent a week at our Boys' Camp. The sum of \$2,000 in extra prize money is now given through the State Board of Agriculture for this work. The club work connects the school and the home in a better manner than I have ever known before. In this work we have the active co-operation of a large majority of school superintendents, teachers, and fair managers of the State. Requests have been made for us to organize fruit, pig, and calf clubs. We do not deem it wise to enlarge the work until more supervision can be given. Fully 100,000 boys and girls in the State would enroll if we could furnish the necessary supervision and follow up the work.

### 4. *Farm Management.*

The work of farm management field studies and demonstrations, in order to determine what are profitable systems for farmers to follow, has been continued during the year. Partial surveys of from 10 to 60 farms have been made in a large number of towns. About 100 demonstration plots, covering fertilizers, grass products, and alfalfa, have been carried on. Plans are under way to carry on complete surveys and annual follow-up work on about 60 farms in each of 8 communities during the coming year. This work is reaching down to fundamental problems with which farmers have to deal, and in time will prove one of our most valuable lines of work.

### 5. *Poultry Extension Work.*

Professor Graham has given a large number of lectures and demonstrations along poultry lines, and has assisted in the organization of several poultry associations during the year. Blue-print plans of poultry houses and appliances have been

freely loaned. Boys' poultry club work and a correspondence course have been started. The poultry convention brought 700 or 800 people to the college. There is an urgent need of adding several extension instructors and demonstrators for work all over the State in combating diseases, planning poultry houses, and on problems of incubation, brooding, mating, feeding, and general care.

#### 6. *Civic Improvement.*

In this line of extension work studies have been made in 20 towns. Plans in many cases have been drawn for improving the commons, the church, school, cemetery, or home grounds. Complete plans have been furnished Sterling for a comprehensive scheme of town development, including parks, recreational centers, etc. A special exhibit of this kind of work was held in the Amherst town hall last April, and a plan for the laying out of a town has been sent to the Chicago exhibition and competition.

#### 7. *Community Service.*

Calls have continued to come in for help along community development lines. Definite long-term projects have been laid out and adopted in 13 towns. Two extension schools covering these subjects have been held during the year. Professor Morgan has attended a large number of conferences and meetings which will no doubt lead several other communities to take up the work later. A detailed study of what has actually been accomplished by such a program of work in the town of Hardwick shows the possibilities of well-directed effort in this direction. Professor Morgan has also rendered valuable service as secretary of the Massachusetts Federation of Rural Progress.

#### 8. *Library Extension Work.*

The college librarian has further developed the plan of sending traveling libraries and selected lots of books to the smaller libraries of the State. About 700 volumes are now available for this work. There have been 760 books and 240 pamphlets loaned to 42 libraries during the year. Eight special library leaflets have been printed and distributed.

### 9. *Extension Work in Dairying.*

Lectures and demonstrations have been given on the subjects of handling and marketing milk. Three of the largest milk shows ever held in the country have been arranged during the year. Clean milk exhibits have been held in cities. In this work fine co-operation has prevailed between the college, the Massachusetts Dairy Men's Association, and the milk inspectors of the State.

### 10. *Co-operation and Marketing.*

During the year the work of assisting in the organization of farmers' co-operative business organizations and in marketing has been started. Co-operative organizations have been formed in 7 towns. Assistance in starting credit unions has been given to 7 towns, and 16 other towns have been visited and conferences held regarding the work. Professor Ferguson has spent approximately one-half of his time in a study of the methods of milk distribution in typical small and medium-sized towns, and in cities for the Office of Markets at Washington. Definite data have been secured which will later be used in an effort to help solve the ever-present, and at the present time decidedly unsatisfactory, situation in which the dairy industry finds itself in this State.

### 11. *Extension Work in Prevention of Hog Cholera.*

Dr. D. I. Skidmore was assigned last July to the State by the United States Bureau of Animal Industry, for demonstration work in the prevention of hog cholera. A careful watch is being kept for the disease, and when found Dr. Skidmore shows proper sanitary measures necessary for its eradication. Demonstrations of the application of the serum treatment to live hogs, and talks on the subject, have been given at all of the larger fairs of the State and at special meetings. During the year Dr. Skidmore will work with the 29 State institutions that have considerable trouble with the disease, and through county agents, vocational instructors, granges, and other organizations, in an effort to institute a campaign which will practically eradicate the disease from the State.

### C. PLANS FOR THE WORK AND NEEDS OF THE COMING YEAR.

1. With an appropriation already fixed for the next three years by the State, and the fact that, due to the reasons already stated, Massachusetts receives but \$2,440 additional each year from Smith-Lever bill funds, no enlargement or expansion of extension activities can be expected. The most that we should try to do is to retain if possible our present excellent force of extension workers, and to perfect within the institution itself a better working organization. The idea that live virile instruction like extension work can stand still is one of the greatest fallacies ever agreed to by the trustees.

2. There is an urgent need of the trustees adopting a definite policy defining what the extension work of a State institution should be, and the relation of all employees of the college to it. The idea is all too prevalent that the extension service is simply a department of the college. The director suggests that the following definition might be used on which to base the policy: "The extension service is the whole institution (every department and individual) at work doing what it can to upbuild the rural life of the Commonwealth, and all employees are expected, in so far as extension work does not interfere with their teaching or research work, to take their part in this movement, and to make themselves and their departments as useful as is possible in the different movements to build up the agricultural industry of the State." The director further suggests that if this is to be the policy of the institution then at least the attitude toward extension work in general of all persons taken on to the staff of the college or station should be considered as well as their other qualifications.

3. While there is probably no chance of our meeting any of the immediate needs for more help, yet these should nevertheless be presented. There are organizations such as the poultry men, and those interested in boys' and girls' club work, and market gardening, who are willing to go before the Legislature and secure funds to carry on the work which they want. It seems to me that under such circumstances no objection should be raised by the college.

The most urgent needs are as follows: —

(a) Extension instruction in market gardening (organized on same plan as county work):—		
College's share of salary, . . . . .	\$2,000	
Community pay salary, . . . . .	1,000	
Travel and transportation, . . . . .	700	
Office expenses, . . . . .	1,000	
	\$4,700	\$2,000 <sup>1</sup>
(b) Extension work in poultry husbandry:—		
Two demonstrators' salaries, . . . . .	\$3,000	
Traveling expenses, . . . . .	1,000	
Equipment, etc., . . . . .	500	
	\$4,500	4,500
(c) For salaries and travel of supervisors of boys' and girls' clubs (college pays one-half and United States Department of Agriculture pays one-half), . . . . .		
	\$6,000	3,000 <sup>1</sup>
(d) Extension work in agronomy:—		
Salary, . . . . .	\$1,500	
Travel, . . . . .	500	
Equipment, . . . . .	200	
	\$2,200	2,200
(e) Adviser for work with State institutions (asked for by them; recommended by Governor):—		
Salary, . . . . .	\$3,000	
Travel and other expenses, . . . . .	1,000	
	\$4,000	4,000
(f) Extension work in fruit growing:—		
Salary, . . . . .	\$1,500	
Travel, . . . . .	500	
Equipment, . . . . .	200	
	\$2,200	2,200
(g) For co-operative work with United States Department of Agriculture: (1) farm management; (2) demonstrations; (3) boys' poultry and fruit clubs (college pays one-half and United States Department of Agriculture pays one-half), . . . . .		
	\$6,000	3,000 <sup>1</sup>
(h) Pay toward the salary of each extension representative in vocational schools and county agricultural schools, \$100, . . . . .		
		1,800
Total, . . . . .		\$22,700

<sup>1</sup> College share.

4. Since the college receives for instructional purposes an automatic increase in its funds, the cost of running the short courses (approximately \$8,000) might be paid from these funds, thus relieving the extension budget to that extent; then some of this much-needed work could be started.

5. Every effort is being made to develop within the college an extension organization which is in line with that advocated by the leaders of the movement in the several States and in the United States Department of Agriculture. It is expected that a good deal of progress can be made during the coming year.

6. Plans have been made to have projects presented soon after December 1 by every man expending Extension Service money, in order that the work may be carefully reviewed at the beginning of the year and checked up at the end.

7. I would recommend that a complete report of the extension service covering the work of the last two years be printed as near January 1 as is possible.

WILLIAM D. HURD,

*Director.*

## TABLES AND STATISTICS.

TABLE I. — *New Appointments.*

*In the Academic Departments.*

POSITION.	Name.	Institution from which graduated and Degrees.
Graduate assistant in microbiology, . . . . .	Roy C. Avery, . . . . .	Connecticut Agricultural College, B.Sc., 1914.
Assistant in dairying, . . . . .	Harold E. Baldinger, . . . . .	Cornell University, B.Sc., 1914.
Associate professor of rural engineering,	Christian I. Gunness,	North Dakota Agricultural College, B.Sc., 1907.
Graduate assistant in chemistry, . . . . .	Franklin C. Gurley, . . . . .	Worcester Polytechnic Institute, B.Sc., 1914.
Instructor in dairying, . . . . .	Ivan McKellip, . . . . .	Nebraska State University, B.Sc.Agr., 1911. Cornell University, M.Sc. Agr., 1912.
Graduate assistant in agronomy, . . . . .	Frederick G. Merkle,	Massachusetts Agricultural College, B.Sc., 1914.
Graduate assistant in chemistry, . . . . .	Stuart P. Miller, . . . . .	Worcester Polytechnic Institute, B.Sc., 1914.
Assistant professor of floriculture, . . . . .	Arno H. Nehrling, . . . . .	Missouri Botanical Garden and Shaw School of Botany, F.H.S., 1909.
Graduate assistant in landscape gardening.	Carl F. Oberhelman, . . . . .	Ohio State University, B.Sc., 1913.
Instructor in poultry husbandry, . . . . .	Loyal F. Payne, . . . . .	Oklahoma Agricultural College, B.Sc., 1912.
Instructor in English, . . . . .	Frank P. Rand, . . . . .	Williams College, A.B., 1912.
Assistant in entomology, . . . . .	William S. Regan, . . . . .	Massachusetts Agricultural College, B.Sc., 1908.
Graduate assistant in floriculture, . . . . .	Arthur S. Thurston, . . . . .	Massachusetts Agricultural College, B.Sc., 1914.
Graduate assistant in animal husbandry,	Warren F. Whittier, . . . . .	Harvard College, A.B., 1909.



*In the Experiment Station.*

POSITION.	Name.	Institution from which graduated and Degrees.
Assistant botanist, . . . . .	Orton L. Clark, . . . . .	Massachusetts Agricultural College, B.Sc., 1908.

*In the Extension Service.*

Extension instructor in farm demonstration.	Benjamin W. Ellis, . . . . .	Massachusetts Agricultural College, B.Sc., 1913.
Extension professor of agricultural economics.	Richard H. Ferguson, . . . . .	Ontario Agricultural College, B.Sc.Agr., 1913.
Extension instructor in home economics.	Harriet J. Hopkins, . . . . .	Teachers College, Columbia University, B.Sc., 1914.
Extension instructor in agricultural education.	Ethel H. Nash, . . . . .	Hyannis State Normal School, 1907.

*In the Clerical Staff.*

POSITION.	Name.
Clerk, Department of Farm Administration, . . . . .	Frances E. Boynton.
Clerk, president's office, . . . . .	Mary E. Horton.
Stenographer, Department of Poultry Husbandry, . . . . .	Elizabeth E. Mooney.
Stenographer, treasurer's office, . . . . .	Gladys P. Moore.
Clerk, treasurer's office, . . . . .	Luther R. Putney.
Stenographer, Division of Horticulture, . . . . .	Helen C. Pomeroy.
Bookkeeper, treasurer's office, . . . . .	Edna M. Sanders.
Stenographer, extension service, . . . . .	Elsa Slattery.
Stenographer, Department of Agricultural Economics, . . . . .	Harriet C. Stevenson.
Stenographer, Division of Agriculture, . . . . .	Aurelia B. Wentworth.

TABLE II. — *Resignations.*

POSITION.	Name.
Clerk, Division of Agriculture, . . . . .	Luliona M. Barker.
Instructor in poultry husbandry, . . . . .	Adrian A. Brown.
Cashier, . . . . .	Harold A. Crane.
Associate professor of rural sociology, . . . . .	Elmer K. Eyerly.
First clerk, experiment station, Department of Chemistry, . . . . .	F. Ethel Felton.
Instructor in market gardening, . . . . .	Bert C. Georgia. <sup>1</sup>
Assistant botanist, experiment station, . . . . .	Edward A. Larrabee.
Instructor in dairying, . . . . .	Ivan McKellip.
Dean emeritus, . . . . .	George F. Mills. <sup>2</sup>
Stenographer, treasurer's office, . . . . .	Gladys P. Moore.
Stenographer, treasurer's office, . . . . .	Dorothy Mudge.
Foreman, poultry experimental yards, . . . . .	John W. Sayer.

<sup>1</sup> Died May 24, 1914.<sup>2</sup> Died Oct. 27, 1914.

TABLE III. — *Change in Title of Officers of the Institution.*

NAME.	Former Title.	Present Title.
Ernest Anderson, . . .	Assistant professor of chemistry,	Associate professor of chemistry.
Robert H. Bogue, . . .	Assistant in chemistry, . . .	Instructor in chemistry.
Mary E. Caldwell, . . .	First clerk, treasurer's office, . . .	Cashier.
C. Robert Duncan, . . .	Instructor in mathematics, . . .	Assistant professor of mathematics.
Burton N. Gates, . . .	Assistant professor of beekeeping.	Associate professor of beekeeping.
Lillian M. Gelinax, . . .	Stenographer, president's office, . . .	Clerk, president's office.
Cora B. Grover, . . .	Stenographer, extension service,	Clerk, extension service.
Helena T. Goessmann, . . .	Assistant in English, . . .	Instructor in English.
Curry S. Hicks, . . .	Assistant professor of physical education and hygiene.	Associate professor of physical education and hygiene.
Alice M. Howard, . . .	Clerk, experiment station, . . .	First clerk, experiment station.
Edward M. Lewis, . . .	Associate dean of the college and professor of literature.	Dean of the college and professor of languages and literature.
F. A. McLaughlin, . . .	Assistant in botany, . . .	Instructor in botany.
William L. Machmer, . . .	Instructor in mathematics, . . .	Assistant professor of mathematics.
George F. Mills, . . .	Dean of the college, . . .	Dean emeritus.
Arno H. Nehrling, . . .	Assistant professor of floriculture.	Associate professor of floriculture.
A. Vincent Osmun, . . .	Assistant professor of botany,	Associate professor of botany.
Elvin L. Quaife, . . .	Instructor in animal husbandry,	Assistant professor of animal husbandry.
F. H. VanSuchtelen, . . .	Assistant professor of microbiology.	Associate professor of microbiology.
Ralph J. Watts, . . .	Secretary to the president, . . .	Secretary of the college.
Henrietta Webster, . . .	Bookkeeper, treasurer's office, . . .	First clerk, treasurer's office.

TABLE IV. — *Speakers for the Year.*A. *Speakers at Wednesday Assembly for Year ending Nov. 30, 1914.*

## 1913.

- Dec. 10. — Hon. Frank H. Pope, Boston, "Persistence of Opportunity."  
 Dec. 17. — Dr. Charles Fleischer, Boston, "Democracy."

## 1914.

- Jan. 21. — Dr. William Burdick, Baltimore, Md., "Loyalty and College Athletics."  
 Feb. 11. — Mr. William H. Lewis, Boston, "Race and Democracy."  
 Feb. 18. — Mr. Sydney H. Coleman, Albany, N. Y., "The American Humane Association."  
 Feb. 25. — Prof. Paul C. Phillips, Amherst College, "The Olympic Games at Stockholm."  
 Mar. 4. — Dr. Shosuke Sato, Japan, "Japan."  
 Mar. 11. — Mr. Albert D. Taylor, Boston, "Personal Experience in Business."  
 Mar. 18. — Rev. E. B. Robinson, Holyoke, Mass., "Becoming a Neighbor."  
 Mar. 25. — Prof. Kenneth McKenzie, Yale University.  
 Apr. 15. — Mr. Wilfrid Wheeler, Boston, "The Work of the State Board of Agriculture."  
 Apr. 22. — Mr. Ora S. Gray, Amherst, "The Animals of Ephesus."  
 May 13. — Pres. Kenyon L. Butterfield, "The Southwest."  
 May 20. — Mr. John A. Scheuerle, Springfield, Mass., "The Work of the Hampden County Improvement League."  
 May 27. — Mr. Henry Lasker, Springfield, Mass., "Patriotism in Times of War and of Peace."  
 Sept. 16. — Prof. Robert J. Sprague, M. A. C., "The Roots of the War."  
 Sept. 23. — Pres. E. T. Fairchild, New Hampshire State College, "Success and Failure."  
 Sept. 30. — Prof. Frank A. Waugh, M. A. C., "Civic Art."  
 Oct. 7. — Pres. Kenyon L. Butterfield, "The College as a Leader."

- Oct. 14. — Prof. John M. Tyler, Amherst College, "Leadership."  
 Oct. 21. — Dr. Edwin D. Mead, Boston, "The United States and the United World."  
 Oct. 28. — Dr. Henry Wallace, Des Moines, Ia., "Leadership."  
 Nov. 4. — Pres. Kenyon L. Butterfield, "The College Man as a Leader."  
 Nov. 11. — Prof. Lewis Perry, Phillips Exeter Academy, "Education and the Drama."  
 Nov. 18. — Mr. W. J. Campbell, Springfield Y. M. C. A. College, "The Work of the County Secretary of the Y. M. C. A."

*B. Speakers at Sunday Chapel for Year ending Nov. 30, 1914.*

**1913.**

- Dec. 7. — Rev. R. H. M. Augustine, Hanover, N. J., "Three Essential Elements in the New Rural Civilization."  
 Dec. 14. — Rev. Samuel A. Eliot, Boston, "The Uses of Adversity."

**1914.**

- Jan. 11. — Mr. Albert E. Roberts, New York City, "The Cost of Leadership."  
 Jan. 18. — Dr. Charles R. Brown, Yale University, "The Man and Inner Man."  
 Feb. 8. — Dr. Albert P. Fitch, Cambridge, Mass., "Three Marks of Genius in Youth."  
 Feb. 15. — Rev. Theodore Sedgwick, New York City, "Who Hath Warned You?"  
 Mar. 1. — Rev. Herbert J. White, Hartford, Conn., "The Salvation of a Christian."  
 Mar. 8. — Rev. Anson P. Stokes, Yale University, "Christianity."  
 Mar. 15. — Prof. John F. Russell, Williams College, "How to make Life Worth Living."  
 Mar. 22. — Rev. Paul R. Frothingham, Boston, "The Significance of Tools."  
 Apr. 12. — Rev. Willard Scott, Brookline, Mass., "The Excelling Life."  
 Apr. 26. — Rev. Nehemiah Boynton, Brooklyn, N. Y., "Prosperity — An Affair of Spirit."  
 Sept. 13. — Pres. Kenyon L. Butterfield, "Character Building."  
 Nov. 8. — Mr. Albert E. Roberts, New York City, "The Abundant Life."  
 Nov. 15. — Rev. E. B. Robinson, Holyoke, Mass., "The Unsuspected Purpose of God."  
 Nov. 22. — Rev. Clarence F. Swift, Fall River, Mass., "The Cord of Blue."

**TABLE V. — Attendance.**

*A. In Work of College Grade.*

	Registration Nov. 30, 1913.	Registration Nov. 30, 1914.
Senior class, . . . . .	98	103
Junior class, . . . . .	103	113
Sophomore class, . . . . .	140	142
Freshman class, . . . . .	201	168
	<hr/> 542	<hr/> 526
Graduate students, . . . . .	39	52
Unclassified students, . . . . .	24	32
Total doing work of college grade, . . . . .	<hr/> 605	<hr/> 610

*B. Short-course Enrollment and Convention Registration.*

	1913.	1914.
Winter school, . . . . .	153	182
Summer school, . . . . .	133	146
Apple-packing school, . . . . .	25	30
School for tree wardens, . . . . .	44	22
Beekeepers' school, . . . . .	6	—
Farmers' Week, . . . . .	950	1,563
School for rural social service, . . . . .	—	22
Boys' Camps, . . . . .	33	47
Polish farmers' day, . . . . .	—	86
Poultry convention, . . . . .	362	586
Conference on rural community planning, . . . . .	247	329
Beekeepers' convention, . . . . .	115	—
Convention of county agents and agricultural instructors, . . . . .	—	28
Total, . . . . .	<hr/> 2,068	<hr/> 3,041

TABLE VI. — *Legislative Budget, 1914.*

ITEMS.	Amount asked.	Amount granted.
Special appropriations:—		
Agricultural building, including equipment, . . . . .	\$210,000	\$210,000
Student dormitory, . . . . .	35,000	—
Minor additions, . . . . .	10,000	—
	\$255,000	\$210,000

TABLE VII. — *Statistics of Freshmen entering Massachusetts Agricultural College, September, 1914.**A. Home Addresses of Students (classified by Towns and Cities).*

Adams, . . . . . 1	Hartford, Conn., . . . . . 1	Paterson, N. J., . . . . . 3
Amesbury, . . . . . 1	Haverhill, . . . . . 1	Peabody, . . . . . 3
Amherst, . . . . . 6	Hingham, . . . . . 3	Pittsfield, . . . . . 2
Andover, . . . . . 1	Holyoke, . . . . . 4	Plainfield, N. J., . . . . . 1
Arlington, . . . . . 1	Hopkinton, . . . . . 1	Plainville, Conn., . . . . . 1
Ashfield, . . . . . 1	Hyde Park, . . . . . 2	Plymouth, . . . . . 1
Attleborough, . . . . . 1	Ipswich, . . . . . 1	Putnam, Conn., . . . . . 1
Ayer, . . . . . 1	Keene, N. H., . . . . . 1	Quincy, . . . . . 1
Barre, . . . . . 1	Kinderhook, N. Y., . . . . . 1	Revere, . . . . . 2
Bedford, . . . . . 1	Lawrence, . . . . . 2	Rockland, . . . . . 1
Belchertown, . . . . . 1	Lima, N. Y., . . . . . 1	Salem, . . . . . 4
Berlin, . . . . . 1	Lowell, . . . . . 1	Scitio, Conn., . . . . . 1
Beverly, . . . . . 2	Lynn, . . . . . 5	Sharon, . . . . . 2
Blackstone, . . . . . 1	Malden, . . . . . 1	Sheffield, . . . . . 1
Blauvelt, N. Y., . . . . . 1	Marlborough, . . . . . 2	Sherborn, . . . . . 1
Bolton, . . . . . 1	Maynard, . . . . . 1	South Hadley Falls, . . . . . 1
Boston, . . . . . 11	Medford, . . . . . 2	Somerville, . . . . . 2
Brimfield, . . . . . 2	Melrose, . . . . . 1	Springfield, . . . . . 3
Brockton, . . . . . 1	Middleborough, . . . . . 1	Stow, . . . . . 1
Brooklyn, N. Y., . . . . . 1	Milford, . . . . . 2	Sudbury, . . . . . 1
Byfield, . . . . . 1	Montpelier, Vt., . . . . . 1	Uxbridge, . . . . . 1
Cambridge, . . . . . 1	Nantucket, . . . . . 1	Wakefield, . . . . . 2
Canton, . . . . . 1	Needham, . . . . . 2	Waltham, . . . . . 1
Chelsea, . . . . . 1	New Bedford, . . . . . 1	Ware, . . . . . 1
Dalton, . . . . . 1	New Braintree, . . . . . 1	Warren, . . . . . 1
Danvers, . . . . . 1	Newburyport, . . . . . 1	Wellesley, . . . . . 1
Deerfield, . . . . . 1	New Canaan, Conn., . . . . . 1	Wenham, . . . . . 1
Durham, Conn., . . . . . 1	Newington, Conn., . . . . . 1	West Tisbury, . . . . . 1
Everett, . . . . . 2	New Milford, Conn., . . . . . 1	Wilmette, Ill., . . . . . 1
Fairhaven, . . . . . 2	Newport, R. I., . . . . . 1	Windsor, Conn., . . . . . 1
Fall River, . . . . . 5	New Rochelle, N. Y., . . . . . 1	Winsted, Conn., . . . . . 1
Falmouth, . . . . . 2	Newton, . . . . . 5	Worcester, . . . . . 7
Gloucester, . . . . . 1	Newtown, Conn., . . . . . 1	Yalesville, Conn., . . . . . 1
Great Barrington, . . . . . 2	Norwood, . . . . . 1	
Groton, . . . . . 1	Palmer, . . . . . 2	

*B. Home Addresses (classified by States).*

	Number.	Per Cent.		Number.	Per Cent.
Connecticut, . . .	12	7.14	New York, . . .	5	2.97
Illinois, . . .	1	.60	Rhode Island, . . .	1	.60
Massachusetts, . . .	143	85.11	Vermont, . . .	1	.60
New Hampshire, . . .	1	.60			
New Jersey, . . .	4	2.38		168	100.00

*C. Home Addresses (classified by Counties of Massachusetts).*

	Number.	Per Cent.		Number.	Per Cent.
Barnstable, . . .	2	1.40	Middlesex, . . .	27	18.88
Berkshire, . . .	7	4.90	Nantucket, . . .	1	.70
Bristol, . . .	9	6.29	Norfolk, . . .	10	6.99
Dukes, . . .	1	.70	Plymouth, . . .	7	4.90
Essex, . . .	27	18.88	Suffolk, . . .	14	9.79
Franklin, . . .	2	1.40	Worcester, . . .	16	11.19
Hampden, . . .	11	7.69			
Hampshire, . . .	9	6.29		143	100.00

*D. Nativity of Parents.*

	Number.	Per Cent.
Neither parent foreign born, . . . . .	130	77.38
Both parents foreign born, . . . . .	25	14.88
Father (only) foreign born, . . . . .	5	2.98
Mother (only) foreign born, . . . . .	7	4.17
No statistics, . . . . .	1	.60
	168	100.01

*E. Education of Father.*

	Number.	Per Cent.
Common school, . . . . .	78	46.43
High school, . . . . .	45	26.79
Business school, . . . . .	15	8.93
College or university, . . . . .	26	15.48
No statistics, . . . . .	4	2.38
	168	100.01

*F. Religious Census.*

	MEMBERSHIP.		PREFERENCE.		TOTALS.	
	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.
Baptist, . . . . .	10	5.95	6	3.57	16	9.52
Catholic, . . . . .	10	5.95	1	.60	11	6.55
Congregationalist, . . . . .	38	22.62	21	12.50	59	35.12
Episcopal, . . . . .	15	8.93	3	1.79	18	10.71
Hebrew, . . . . .	5	2.98	-	-	5	2.98
Lutheran, . . . . .	3	1.79	1	.60	4	2.38
Methodist, . . . . .	16	9.52	3	1.79	19	11.31
Presbyterian, . . . . .	2	1.19	1	.60	3	1.79
Unitarian, . . . . .	11	6.55	10	5.95	21	12.50
Universalist, . . . . .	2	1.19	2	1.19	4	2.38
Miscellaneous, . . . . .	4	2.38	4	2.38	8	4.76
	116	69.05	52	30.97	168	100.00

*G. Occupation of Father.*

	Number.	Per Cent.
Agriculture and horticulture, . . . . .	42	25.00
Artisans, . . . . .	33	19.64
Business, . . . . .	46	27.38
Deceased or no statistics, . . . . .	11	6.55
Miscellaneous, . . . . .	14	8.33
Professional, . . . . .	21	12.50
Retired, . . . . .	1	.60
	168	100.00

*H. Intended Vocations of Students.*

	Number.	Per Cent.
Agriculture or horticulture (practical), . . . . .	72	42.84
Agriculture or horticulture (professional), . . . . .	61	36.31
Miscellaneous, . . . . .	5	2.98
Professions, . . . . .	4	2.38
Undecided or no statistics, . . . . .	26	15.48
	168	99.99

*I. Farm Experience.*

	Number.	Per Cent.
Brought up on a farm, . . . . .	53	31.55
Not brought up on a farm, and having had no, or practically no, farm experience, . . . . .	60	35.71
Not brought up on a farm, but having had some farm experience, . . . . .	55	32.74
	168	100.00

*J. Miscellaneous Statistics.*

Average age, . . . . .	19.06 years.
Number signifying their intention to seek student labor, . . . . .	100 (59.52 per cent.)
Number boarding at the college dining hall, . . . . .	153 (91.07 per cent.)

TABLE VIII. — *Entrance Statistics of Freshmen Class.*

Number of applications, . . . . .	273
Admitted, . . . . .	200
Matriculated, . . . . .	168
Failed to report, . . . . .	32
	<hr/>
Total, . . . . .	200
Rejected, . . . . .	73
	<hr/>
Total, . . . . .	273
Admitted on certificate, . . . . .	183
Admitted on examination, . . . . .	3
Admitted on certificate and examination, . . . . .	14
	<hr/>
	200
Admitted without condition, . . . . .	145
Admitted with condition, . . . . .	-55
	<hr/>
	200

TABLE IX. — *Official Visits by Outside Organizations.*

- Connecticut Valley Breeders' Association.
- Garden and Club Workers.
- Holyoke and Northampton Florists' and Gardeners' Club.
- M. A. C. Improvement Association.
- M. A. C. Short Course Association.
- Massachusetts Dairymen's Association.
- Massachusetts Federation for Rural Progress.
- Massachusetts State Branch of the American Poultry Association.
- Massachusetts State Grange.
- Massachusetts State Poultry Association.
- Massachusetts State Swine Breeders' Association.
- New England Home Economics Association.
- Western Massachusetts Library Club.
- Worcester County Holstein Club.

## REPORT OF THE TREASURER

FOR THE FISCAL YEAR ENDING NOV. 30, 1914.

## BALANCE SHEET.

	Dr.	Cr.
<b>1913.</b>		
Dec. 1. To balance on hand, . . . . .	\$40,983 30	
<b>1914.</b>		
Nov. 30. To receipts for fiscal year (see Schedule A), . . . . .	625,937 16	\$615,951 14
Expenditures for fiscal year (see Schedule B), . . . . .		50,969 32
Balance on hand, . . . . .		
	\$666,920 46	\$666,920 46

## STATEMENT OF THE FIRST NATIONAL BANK OF AMHERST WITH THE MASSACHUSETTS AGRICULTURAL COLLEGE.

	Dr.	Cr.
<b>1913.</b>		
Dec. 1. Balance on hand, . . . . .	\$61,004 37 <sup>1</sup>	
<b>1914.</b>		
Nov. 30. Deposits for year, . . . . .	616,504 87	
Interest, . . . . .	2,491 75	\$614,618 25
Disbursements as per warrants, . . . . .		65,382 74 <sup>1</sup>
Balance on hand, . . . . .		
	\$680,000 99	\$680,000 99

<sup>1</sup> These amounts are greater Dec. 1, 1913, by \$29,841.81, and Nov. 30, 1914, by \$37,396.40, on account of outstanding checks.

## SCHEDULE A. — INCOME.

	Items.	Totals.
Income from students and others, . . . . .		\$120,311 68
Tuition fees, . . . . .	\$2,267 00	
Laboratory fees, . . . . .	5,188 27	
Rents, . . . . .	5,152 70	
Dining hall, . . . . .	57,812 19	
Department sales, . . . . .	43,935 01	
Department transfers, . . . . .	2,440 19	
Miscellaneous, . . . . .	3,516 32	



SCHEDULE A. — INCOME — *Concluded.*

	Items.	Totals.
Income from grants by nation and State: —		
State aid, . . . . .		\$356,820 86
Income from endowment, . . . . .	\$3,313 32	
Appropriation for current expenses, . . . . .	210,000 00	
Administration, . . . . .	\$30,000 00	
Maintenance, . . . . .	85,000 00	
Instruction, . . . . .	85,000 00	
Graduate school, . . . . .	2,000 00	
Improvements, . . . . .	8,000 00	
Appropriation for extension service, . . . . .	50,000 00	
Appropriation for experiment station, . . . . .	26,000 00	
Maintenance, . . . . .	\$20,000 00	
Feed law, . . . . .	6,000 00	
Receipts from special appropriations, . . . . .	67,507 54	
Federal aid, . . . . .		75,633 33
Income from land grant of 1862, . . . . .	\$7,300 00	
Income from Hatch fund of 1887, . . . . .	15,000 00	
Income from Adams fund of 1906, . . . . .	15,000 00	
Income from Nelson fund of 1907, . . . . .	16,666 67	
Income from Morrill fund of 1890, . . . . .	16,666 66	
Income from Smith-Lever fund of 1914, . . . . .	5,000 00	
Income from other sources: —		
Income from experiment station, . . . . .		26,722 87
Fertilizer receipts, . . . . .	\$11,112 00	
Agricultural receipts, . . . . .	2,494 49	
Cranberry receipts, . . . . .	2,676 86	
Chemical receipts, . . . . .	10,013 33	
Miscellaneous, . . . . .	426 19	
Income from extension service, . . . . .		5,023 27
Winter school receipts, . . . . .	\$1,308 85	
Summer school receipts, . . . . .	738 45	
Correspondence course receipts, . . . . .	832 86	
Itinerary instruction receipts, . . . . .	905 25	
Miscellaneous, . . . . .	1,237 86	
Received on account of student trust funds, . . . . .		41,425 15
		\$625,937 16

## CLASSIFICATION OF INCOME FROM STUDENTS AND OTHERS.

	Laboratory Fees.	Department Sales.	Transfers.	Rents.	Income.	Miscellaneous.	Dining Hall.	Tuition.	Total.
Astronomy,	\$161 00	\$16 70	-	-	-	-	-	-	\$177 70
Agricultural education,	-	58 00	-	-	-	-	-	-	58 00
Animal husbandry,	173 00	3 50	-	-	-	-	-	-	176 50
Beekeeping,	-	8 15	-	-	-	-	-	-	8 15
Botany,	599 40	22 05	-	-	-	-	-	-	621 45
Chemistry,	2,588 14	19 53	\$37 47	-	-	-	-	-	2,655 14
Dairy,	98 00	12,307 59	890 79	-	-	-	-	-	13,296 38
Equipment, 1914,	-	115 00	-	-	-	-	-	-	115 00
Entomology,	119 00	6 47	-	-	-	-	-	-	125 47
Farm,	-	20,083 19	1,128 17	-	-	-	-	-	21,211 36
Farm administration,	-	2 94	-	-	-	-	-	-	2 94
Floriculture,	-	2,994 81	36 43	-	-	-	-	-	2,991 24
Forestry,	-	14 40	50 70	-	-	-	-	-	65 10
General horticulture,	-	-	178 84	-	-	-	-	-	1,681 26
Grounds,	-	-	1 24	-	-	-	-	-	30 16
Improvements, 1914,	-	28 92	64 44	-	-	-	-	-	64 44
Landscape gardening,	385 90	-	1 77	-	\$417 09	-	-	-	397 67
Library,	-	124 67	28 97	-	-	-	-	-	570 73
Market gardening,	-	1,601 37	3 17	-	-	-	-	-	1,604 54
Microbiology,	235 00	64 50	1 60	-	-	-	-	-	301 10
Physical education,	119 00	4 50	-	-	-	-	-	-	123 50
Pomology,	231 75	1,231 67	1 25	-	-	-	-	-	1,464 67
Poultry,	108 00	3,094 65	12 35	-	-	-	-	-	3,215 00
Veterinary,	-	11 82	3 00	-	-	-	-	-	14 82
Zoology,	346 00	5 17	-	-	-	-	-	-	351 17
Operating and maintenance,	-	-	12 60	-	-	\$3,555 72	-	\$2,267 00	5,835 32
North dormitory,	-	-	-	\$2,094 17	-	-	-	-	2,094 17
South dormitory,	-	-	-	2,327 65	-	-	-	-	2,327 65
College residences,	-	-	-	678 88	-	-	-	-	678 88
Executive order,	-	2 50	-	-	-	-	-	-	2 50
President's office,	-	50	-	-	-	-	-	-	50
Treasurer's office,	-	17	-	-	-	-	-	-	17
Salaries,	-	236 81	-	-	-	-	-	-	236 81
Dining hall,	-	-	-	-	-	-	\$57,812 19	-	57,812 19
Totals,	\$5,184 19	\$43,522 00	\$2,452 79	\$5,100 70	\$417 09	\$3,555 72	\$57,812 19	\$2,267 00	\$120,311 68

## SCHEDULE B. — EXPENDITURES FOR FISCAL YEAR.

	Items.	Totals.
College expenses, . . . . .		\$316,752 76
Administration, . . . . .	\$31,067 12	
Maintenance, . . . . .	162,584 99	
Instruction, . . . . .	123,100 65	
Experiment station, . . . . .		81,587 92
Administration, . . . . .	\$1,416 13	
Feed inspection, . . . . .	5,897 93	
Fertilizer law, . . . . .	9,744 92	
Salaries, . . . . .	36,202 83	
Departments, . . . . .	28,326 11	
Extension service, . . . . .		56,104 76
Salaries, . . . . .	\$28,614 13	
Travel, . . . . .	9,361 54	
Department, . . . . .	18,129 09	
Special appropriation, . . . . .		58,307 54
Student trust funds, . . . . .		44,797 09
Dining hall, . . . . .		58,401 07
		\$615,951 14

## ANALYSIS OF COLLEGE EXPENDITURES.

ADMINISTRATION.	Office Expense.	Salaries and Labor.	Travel.	Minor Equipment.	Building Supplies.	Publicity and Lectures.	Student Activity.	Comme-ment.	Miscel-laneous.	Total.
Dean's office, . . . . .	\$165 08	\$296 56	—	\$49 60	—	\$1,689 47	—	—	—	\$511 24
Executive order, . . . . .	—	—	\$1,616 20	—	—	—	\$773 24	\$502 35	\$1,615 21	6,196 47
President's office, . . . . .	682 92	104 24	66 85	—	\$18 48	—	—	—	—	872 49
Registrar's office, . . . . .	323 61	77 63	15 20	19 92	2 89	—	—	—	—	489 25
Treasurer's office, . . . . .	549 92	366 53	220 83	56 01	29 66	—	—	—	30 45	1,253 40
Administration (salaries), . . . . .	—	21,794 27	—	—	—	—	—	—	—	21,794 27
Totals, . . . . .	\$1,721 53	\$22,639 23	\$1,919 08	\$125 53	\$51 03	\$1,689 47	\$773 24	\$502 35	\$1,645 66	\$31,067 12

MAINTENANCE.	Office Expense.	Labor.	Laboratory Supplies.	Refunds.	Minor Equipment.	Building Supplies.	Travel.	General Expense.	Miscel-laneous.	Salaries.	Totals.
Academic maintenance: —											
Agricultural economics, . . . . .	\$62 75	\$18 90	\$14 88	—	\$0 48	—	\$6 15	—	—	—	\$103 16
Agricultural education, . . . . .	110 86	87 75	139 15	—	3 61	—	38 90	—	—	—	386 65
Agronomy, . . . . .	62 00	61 42	182 33	\$15 50	81	—	22 85	—	—	—	294 91
Animal husbandry, . . . . .	69 80	152 73	69 81	10 00	24 58	—	269 82	—	—	—	593 44
Beekeeping, . . . . .	133 42	1,196 33	171 96	—	116 62	\$56 15	1 62	—	—	—	1,676 10
Botany, . . . . .	196 18	631 75	480 29	74 70	30 51	48 00	—	—	—	—	1,461 43
Chemistry, . . . . .	184 83	1,023 10	2,457 03	649 45	85 27	94 81	5 30	—	—	—	4,499 79
Dairying, . . . . .	127 94	1,083 72	14,909 14	13 50	290 53	80 24	41 45	—	—	—	16,549 52
Economics and sociology, . . . . .	30 76	—	1 09	—	80	—	—	—	—	—	32 65
Entomology, . . . . .	37 67	260 68	159 20	6 00	51 46	134 71	14 31	—	—	—	664 03
Farm administration, . . . . .	174 47	55 32	39 08	—	73 68	34 57	37 12	—	—	—	377 12
Floriculture, . . . . .	120 51	2,614 89	1,002 79	—	42 02	124 87	100 39	—	—	—	4,005 47
Forestry, . . . . .	72 46	49 49	154 25	—	108 37	—	18 03	—	—	—	402 60
History and government, . . . . .	5 17	—	27	—	—	—	5 17	—	—	—	10 61
Landscape gardening, . . . . .	15 91	9 57	310 00	5 50	—	—	19 20	—	—	—	394 56
Language and literature, . . . . .	50 19	64 00	143 21	—	20 28	2 91	—	—	—	—	286 59



CURRENT ACCOUNTS.  
*Disbursements and Receipts.*

ACCOUNTS.	Disbursements from Dec. 1, 1913, to Nov. 30, 1914.	Receipts from Dec. 1, 1913, to Nov. 30, 1914.	Apportionment for Year ending Nov. 30, 1914.	Balance to Credit.
Administration:—				
Dean's office, . . . . .	\$511 24	—	\$500 00	—\$11 24
Executive order, . . . . .	6,196 47	\$2 50	5,700 00	—493 97
President's office, . . . . .	872 49	50	1,000 00	128 01
Registrar's office, . . . . .	439 25	—	400 00	—39 25
Salaries, . . . . .	21,794 27	236 81	21,000 00	—557 46
Treasurer's office, . . . . .	1,253 40	17	900 00	—353 23
State Treasurer, . . . . .	—	30,000 00	—	—
Maintenance:—				
Agricultural economics, . . . . .	103 16	—	125 00	21 84
Agricultural education, . . . . .	386 65	58 00	300 00	—28 65
Agronomy, . . . . .	294 91	177 70	175 00	57 79
Animal husbandry, . . . . .	593 44	176 50	200 00	—216 94
Beekeeping, . . . . .	1,676 10	8 15	1,600 00	—67 95
Botany, . . . . .	1,461 43	621 45	700 00	—139 98
Chemistry, . . . . .	4,499 79	2,655 14	1,800 00	—44 65
Dairying, . . . . .	16,549 52	13,296 38	2,300 00	—953 14
Economics and sociology, . . . . .	32 65	—	50 00	17 35
Entomology, . . . . .	664 03	125 47	750 00	211 44
Farm administration, . . . . .	377 12	2 94	325 00	—49 18
Floriculture, . . . . .	4,005 47	2,991 24	800 00	—214 23
Forestry, . . . . .	402 60	65 10	450 00	112 50
History and government, . . . . .	10 61	—	50 00	39 39
Landscape gardening, . . . . .	394 56	397 67	440 00	443 11
Language and literature, . . . . .	286 59	—	400 00	113 41
Market gardening, . . . . .	3,763 96	1,604 54	1,700 00	—459 42
Mathematics, . . . . .	172 83	—	200 00	27 17
Microbiology, . . . . .	901 10	301 10	600 00	—
Military science, . . . . .	1,326 46	—	1,350 00	23 54
Physical education, . . . . .	715 90	123 70	500 00	92 40
Physics, . . . . .	645 52	—	500 00	—145 52
Pomology, . . . . .	3,847 29	1,464 67	1,800 00	—582 62
Poultry husbandry, . . . . .	5,080 67	3,215 00	2,000 00	134 33
Rural engineering, . . . . .	96 33	—	200 00	103 67
Rural sociology, . . . . .	40 76	—	25 00	—15 76
Veterinary science, . . . . .	996 53	14 82	750 00	—231 71
Zoölogy and geology, . . . . .	772 70	351 17	250 00	—171 53
Maintenance, general:—				
Equipment, 1914, . . . . .	11,271 71	115 00	12,000 00	\$43 29
Farm, . . . . .	28,869 16	21,211 36	4,500 00	—3,157 80
General horticulture, . . . . .	4,316 98	1,681 26	2,300 00	—335 72
Graduate school, . . . . .	90 99	—	100 00	9 01
Grounds, . . . . .	3,026 66	30 16	3,250 00	253 50
Improvement, 1914, . . . . .	8,508 96	64 44	8,000 00	—444 52
Library, . . . . .	6,761 82	570 73	5,550 00	—641 09
Operating and maintenance, . . . . .	49,640 03	10,936 02	50,000 00	359 97
State Treasurer, maintenance, . . . . .	—	93,000 10	—	—
Endowment fund, . . . . .	—	10,613 32	—	—
Instruction:—				
Salaries, . . . . .	123,100 65	—	—	—
United States Treasurer:—				
Morrill fund, . . . . .	—	16,666 66	—	—
Nelson fund, . . . . .	—	16,666 67	—	—
State Treasurer:—				
Instruction, . . . . .	—	85,000 00	—	—
Graduate school, . . . . .	—	2,000 00	—	—
	\$316,752 76	\$316,446 14	—	—
Balance beginning fiscal year, Dec. 1, 1913, . . . . .	—	16,379 05	—	—
Balance on hand Nov. 30, 1914, . . . . .	16,072 43	—	—	—
	\$332,825 19	\$332,825 19	—	—

## COLLEGE ACCOUNTS.

*Comparative Disbursements and Receipts for 1913-14.*

ACCOUNTS.	DISBURSEMENTS.		RECEIPTS.	
	1913.	1914.	1913.	1914.
Agricultural economics, . . . . .	\$182 82	\$103 16	—	—
Agricultural education, . . . . .	678 94	356 65	\$250 99	\$58 00
Agronomy, . . . . .	405 86	294 91	109 08	177 70
Animal husbandry, . . . . .	315 10	593 44	30	176 50
Beekeeping, . . . . .	—	1,676 10	—	8 15
Botany, . . . . .	1,643 99	1,461 43	734 19	621 45
Chemistry, . . . . .	4,420 90	4,499 79	2,734 75	2,655 14
Dairying, . . . . .	6,611 35	16,549 52	4,549 40	13,296 38
Dean's office, . . . . .	491 84	511 24	—	—
Economics and sociology, . . . . .	79 36	32 65	—	—
Entomology, . . . . .	1,573 09	664 03	191 97	125 47
Equipment, . . . . .	15,421 90	11,271 71	—	115 00
Executive order, . . . . .	6,297 82	6,196 47	—	2 50
Farm administration, . . . . .	366 29	377 12	33 85	2 94
Farm, . . . . .	24,830 70	28,869 16	20,858 81	21,211 36
Floriculture, . . . . .	4,047 00	4,005 47	3,320 64	2,991 24
Forestry, . . . . .	221 81	402 60	—	65 10
General horticulture, . . . . .	3,735 20	4,316 98	1,425 67	1,681 26
Graduate school, . . . . .	33 25	90 99	—	—
Grounds, . . . . .	2,937 01	3,026 66	3 08	30 16
History and government, . . . . .	37 54	10 61	—	—
Hospital, . . . . .	4,379 20	—	26 50	—
Improvements, 1914, . . . . .	—	8,508 96	—	64 44
Landscape gardening, . . . . .	337 03	394 56	489 10	397 67
Language and literature, . . . . .	300 69	286 59	—	—
Library, . . . . .	6,523 60	6,761 82	561 25	570 73
Market gardening, . . . . .	3,633 23	3,763 96	2,131 12	1,604 54
Mathematics, . . . . .	161 48	172 83	—	—
Military, . . . . .	1,647 19	1,326 46	5 50	—
Microbiology, . . . . .	449 31	901 10	210 00	301 10
Physical education, . . . . .	754 88	715 90	142 50	123 70
Physics, . . . . .	403 43	645 52	2 30	—
Pomology, . . . . .	3,638 96	3,847 29	1,855 82	1,464 67
Poultry husbandry, . . . . .	4,104 22	5,080 67	2,159 18	3,215 00
President's office, . . . . .	934 99	872 49	4 20	50
Registrar's office, . . . . .	401 15	439 25	—	—
Rural engineering, . . . . .	—	96 33	—	—
Rural sociology, . . . . .	27 86	40 76	—	—
Salaries, . . . . .	129,642 00	144,894 92	250 00	236 81
Treasurer's office, . . . . .	1,118 53	1,253 40	11 27	17
Veterinary, . . . . .	1,917 50	996 53	21 65	14 82
Zoölogy and geology, . . . . .	581 09	772 70	333 10	351 17
Operating and maintenance, . . . . .	48,742 64	49,640 03	9,757 60	10,936 02
State Treasurer:—	—	—	—	—
Endowment fund, . . . . .	—	—	10,613 32	10,613 32
Graduate school, . . . . .	—	—	—	2,000 00
Maintenance, . . . . .	—	—	80,000 00	93,000 00
Instruction, . . . . .	—	—	75,000 00	85,000 00
Administration, . . . . .	—	—	30,000 00	30,000 00
United States Treasurer:—	—	—	—	—
Morrill fund, . . . . .	—	—	16,666 66	16,666 66
Nelson fund, . . . . .	—	—	16,666 67	16,666 67
	\$284,080 75	\$316,752 76	\$281,171 18	\$316,446 14
Balance beginning fiscal year, . . . . .	—	—	19,288 62	16,379 05
Balance on hand at close of fiscal year, . . . . .	16,379 05	16,072 43	—	—
	\$300,459 80	\$332,825 19	\$300,459 80	\$332,825 19

COLLEGE ACCOUNTS — *Concluded.**Summary.*

	Disbursements.	Credits.
Cash on hand Dec. 1, 1913, . . . . .	-	\$16,379 05
Institution receipts Nov. 30, 1914, . . . . .	-	62,499 49
State Treasurer receipts Nov. 30, 1914, . . . . .	-	220,613 32
United States Treasurer's receipts Nov. 30, 1914, . . . . .	-	33,333 33
Total disbursements, . . . . .	\$316,752 76	-
	\$316,752 76	\$332,825 19
Bills receivable Dec. 1, 1913, deducted, . . . . .	-	3,827 63
Bills payable Dec. 1, 1913, deducted, . . . . .	2,496 39	-
	\$314,256 37	\$328,997 56
Bills receivable Nov. 30, 1914, . . . . .	-	6,855 03
Bills payable Nov. 30, 1914, . . . . .	2,893 65	-
Balance, . . . . .	18,702 57	-
	\$335,852 59	\$335,852 59

## COLLEGE EQUIPMENT, 1914.

	Disbursements Fiscal Year.		Disbursements Fiscal Year.
Farm, . . . . .	\$678 30	Landscape gardening, . . . . .	\$140 00
Microbiology, . . . . .	2,540 30	Mathematics, . . . . .	75 00
O. and M. power plant, . . . . .	885 91	Farm dairy, . . . . .	388 19
Dairy, . . . . .	873 30	Physical education, . . . . .	265 00
President's office, . . . . .	903 57	Physics, . . . . .	377 63
Dean's office, . . . . .	102 90	Pomology, . . . . .	226 50
Treasurer's office, . . . . .	480 28	Poultry husbandry, . . . . .	218 93
General horticulture, . . . . .	190 93	Veterinary, . . . . .	36 83
Library, . . . . .	125 00	Zoölogy, . . . . .	76 50
Dining hall, . . . . .	750 00	Beekeeping, . . . . .	55 86
Agricultural education, . . . . .	-	South College, . . . . .	115 00
Agronomy, . . . . .	151 40	Experiment station, . . . . .	150 00
Animal husbandry, . . . . .	750 00	Chapel, . . . . .	246 81
Chemistry, . . . . .	314 70	Agricultural economics, . . . . .	36 50
Entomology, . . . . .	102 75		
Farm administration, . . . . .	13 62		\$11,271 71
Forestry, . . . . .	-		



## FARM DISBURSEMENTS.

	Labor.	Equipment.	Feed.	Fertilizer.	Seeds.	Miscellaneous.	Supplies.	Improvements.	Totals.
Dairy, . . . . .	\$1,610 79	\$129 15	—	—	—	\$2,013 10	\$2,030 79	—	\$3,770 73
Cattle, . . . . .	4,567 93	—	\$5,200 43	—	—	—	—	—	11,781 55
Horses, . . . . .	1,533 53	—	1,285 16	—	—	—	451 61	—	3,270 30
Swine, . . . . .	114 79	—	270 12	—	—	50 90	—	—	435 81
Sheep, . . . . .	134 12	—	—	—	—	34 83	—	—	168 95
Field crops, . . . . .	2,795 56	—	—	\$1,168 40	\$307 85	36 14	—	—	4,307 95
Tools and machinery, . . . . .	—	—	—	—	—	533 46	—	—	533 46
Miscellaneous, . . . . .	3,737 98	—	—	—	—	—	73 25	\$789 18	4,600 41
	\$14,494 70	\$129 15	\$6,755 71	\$1,168 40	\$307 85	\$2,668 52	\$2,555 65	\$789 18	\$28,869 16

## FARM CREDITS.

	Milk.	Stock.	Sundry.	Miscellaneous.	Hogs.	Wool.	Corn.	Hay.	Roots.	Labor.	Potatoes.	Totals.
Dairy, . . . . .	\$5,697 81	—	\$6 57	—	—	—	—	—	—	—	—	\$5,704 38
Cattle, . . . . .	11,958 95	—	262 74	—	—	—	—	—	—	—	—	12,221 69
Horses, . . . . .	—	\$50 00	922 21	—	—	—	—	—	—	—	—	972 21
Swine, . . . . .	—	—	—	\$1 50	\$115 50	—	—	—	—	—	—	117 00
Sheep, . . . . .	—	30 00	—	—	—	\$24 66	—	—	—	—	—	54 66
Feed crops, . . . . .	—	—	—	—	—	—	\$1 75	\$425 13	\$241 55	—	—	1,035 23
Tools and machinery, . . . . .	—	—	—	—	—	—	—	—	—	—	—	\$366 80
Miscellaneous, . . . . .	—	—	283 62	—	—	—	—	—	—	\$822 57	—	1,106 19
	\$17,656 76	\$80 00	\$1,475 14	\$1 50	\$115 50	\$24 66	\$1 75	\$425 13	\$241 55	\$822 57	\$366 80	\$21,211 36

## AGRICULTURAL DIVISION.

*Disbursements and Receipts.*

	Disbursements.	Receipts.
Agronomy, . . . . .	\$294 91	\$177 70
Animal husbandry, . . . . .	593 44	176 50
Dairying, . . . . .	16,549 52	13,296 38
Farm, . . . . .	28,869 16	21,211 36
Farm administration, . . . . .	377 12	2 94
Poultry husbandry, . . . . .	5,080 67	3,215 00
Division totals, . . . . .	\$51,764 82	\$38,079 88

*Summary.*

	DR.	CR.
By total division receipts, . . . . .		\$38,079 88
By bills receivable, . . . . .		5,071 70
By net apportionment, . . . . .		9,500 00
To total disbursements, . . . . .	\$51,764 82	
To bills payable, . . . . .	236 11	
Balance, . . . . .	650 65	
	\$52,651 58	\$52,651 58

*Inventory of Quick Assets.*

	Nov. 30, 1913.	Nov. 30, 1914.
Inventory of produce, . . . . .	\$6,431 98	\$8,938 35
Inventory of cattle, . . . . .	11,935 00	13,645 00
Inventory of swine, . . . . .	286 00	375 00
Inventory of horses, . . . . .	5,150 00	5,450 00
Inventory of poultry, . . . . .	1,598 70	941 25
Inventory of sheep, . . . . .	443 00	647 00
	\$25,844 68	\$29,996 60

## HORTICULTURAL DIVISION.

*Disbursements and Receipts.*

	Disbursements.	Receipts.
Floriculture, . . . . .	\$4,005 47	\$2,991 24
Forestry, . . . . .	402 60	65 10
General horticulture, . . . . .	4,316 98	1,681 26
Grounds, . . . . .	3,026 66	30 16
Landscape gardening, . . . . .	394 56	397 67
Market gardening, . . . . .	3,763 96	1,604 54
Pomology, . . . . .	3,847 29	1,464 67
Division totals, . . . . .	\$19,757 52	\$8,234 64

HORTICULTURAL DIVISION — *Concluded.*

*Summary.*

	DR.	CR.
By total division receipts, . . . . .		\$8,234 64
By bills receivable, . . . . .		486 16
By apportionment, . . . . .		10,300 00
To total division disbursements, . . . . .	\$19,757 52	
To bills payable, . . . . .	162 81	
By balance, . . . . .		899 53
	\$19,920 33	\$19,920 33

*Inventory of Quick Assets.*

	Nov. 30, 1913.	Nov. 30, 1914.
Floriculture, . . . . .		\$523 50
Market gardening, . . . . .		107 50
Pomology, . . . . .		612 50
General horticulture (live stock), . . . . .	\$1,935 00	1,625 00
Inventory of supplies, . . . . .	713 25	
	\$2,648 25	\$2,868 50

## EXPENSE OPERATING AND MAINTENANCE.

	Salaries.	Labor.	Fuel and Water.	Repairs.	Supplies.	Tools.	Architect.	Engineer.	Miscellaneous.	Totals.
General:—										
General superintendent,	\$2,281 84	—	—	—	—	—	—	—	—	\$2,281 84
Office,	—	\$1,112 84	—	—	—	—	—	—	—	1,112 84
General expenses,	—	—	—	—	\$2,788 22	—	—	—	—	2,788 22
Power plant:—										
Heat,	—	4,001 19	\$18,195 97	\$673 58	148 73	—	—	—	—	23,019 17
Light,	—	655 98	101 34	455 44	66 87	—	—	—	—	1,279 23
Tools,	—	—	—	—	—	\$380 86	—	—	—	380 86
Waiting station janitor,	—	23 84	—	—	—	—	—	—	—	23 84
Amherst Water Company,	—	—	1,529 02	—	—	—	—	—	—	1,529 02
Night watch,	—	1,263 82	—	—	—	—	—	—	—	1,263 82
Mail service,	—	338 53	—	—	—	—	—	—	—	338 53
Water main,	—	660 73	—	—	—	—	—	—	—	660 73
Steam main,	—	319 53	—	—	—	—	—	—	—	319 53
Sewers and cesspools,	—	6 75	—	—	—	—	—	—	—	6 75
Amherst Gas Company,	—	—	37 87	—	—	—	—	—	—	37 87
Electric light circuit,	—	434 29	—	—	—	—	—	—	—	434 29
Expert services,	—	—	—	—	—	—	\$733 52	—	—	733 52
Walks,	—	234 84	—	—	—	—	—	—	—	234 84
Emergency maintenance,	—	1,594 92	—	—	—	—	—	—	—	1,594 92
Drains,	—	84 26	—	—	—	—	—	—	—	84 26
Fire department,	976 20	129 67	—	—	115 77	—	—	—	—	\$9 98
Sundry,	—	—	—	—	—	—	—	—	2,002 28	2,002 28
Totals,	\$3,258 04	\$10,861 09	\$19,864 50	\$1,129 02	\$3,119 59	\$380 86	\$733 52	—	\$2,012 26	\$41,358 88

## EXPENSE OPERATING AND MAINTENANCE — Continued.

COLLEGE BUILDINGS.		Electric Repairs.	Plumbing Repairs.	Heat Repairs.	C. and M. Repairs.	Janitor.	Bell Ringing.	Sundry.	Totals.
Animal husbandry,	.		\$5 97	\$44 69	\$5 60	—	—	—	\$56 26
Horse barn,	.	\$0 62	24 49	—	57 62	—	—	—	82 73
Dairy barn,	.	62	33 32	17 26	88 69	—	—	—	139 89
Young stock barn,	.	36 01	30 56	—	36 88	—	—	—	103 45
Power building,	.	5 36	18 76	58 82	94 77	\$156 35	—	—	334 06
Chemical building,	.	2 70	50 10	69 10	10 90	—	—	—	132 80
Foultry building,	.	4 59	11 94	—	62 97	—	—	—	79 20
Dairy building,	.	19 68	106 61	24 45	65 74	—	—	—	216 48
Dining hall,	.	—	—	—	20 70	—	—	—	20 70
Drill hall,	.	3 44	39 26	47 13	76 95	—	—	—	166 78
Veterinary,	.	1 06	10 06	37	8 64	—	—	—	20 13
Apary,	.	20 64	20 01	88 38	55 84	—	—	—	184 87
Mathematics building,	.	5 27	17 24	11 74	69 62	—	—	—	103 87
Entomology,	.	1 65	37 47	69 80	273 37	—	—	—	382 20
Clark Hall,	.	1 33	25 93	104 37	113 65	—	—	—	245 28
French Hall,	.	3 14	2 75	19 31	9 41	—	—	—	34 61
Wilder Hall,	.	7 34	4 78	37	18 76	—	—	—	31 25
Old Durfee range,	.	67	—	5 38	35 38	—	—	—	41 43
Horticulture barns,	.	30	37	—	2 52	—	—	—	3 19
Physics building,	.	53	39 07	4 32	351 77	—	—	—	395 69
East experiment station,	.	92	13 78	50 81	37 37	—	—	—	102 88
West experiment station,	.	2 70	13 43	9 24	41 82	—	—	—	67 19
Experiment station barn,	.	—	6 05	—	160 08	—	—	—	166 13
P. and A. chemistry barn,	.	1 25	5 89	23 77	23 77	—	—	—	32 04
Microbiology,	.	10 50	123 99	153 68	195 66	—	—	\$500 00	983 83
Farm cottage,	.	—	1 74	—	38 02	—	—	—	39 76
North College,	.	44 48	40 59	8 45	193 73	447 98	—	140 57	875 80
South College,	.	141 88	197 06	53 51	633 18	572 06	—	119 68	1,717 37
Chapel,	.	27 94	11 88	38 40	48 08	245 82	\$100 00	—	472 72
Total,	.	\$344 62	\$833 10	\$880 71	\$2,831 79	\$1,422 21	\$100 00	\$760 25	\$7,232 68



EXPERIMENT STATION.  
*Disbursements and Receipts.*

ACCOUNTS.	Disbursements from Dec. 1, 1913, to Nov. 30, 1914.	Receipts from Dec. 1, 1913, to Nov. 30, 1914.	Apportionment for Year ending Nov. 30, 1914.	Balance to Credit.
Administration, . . . . .	\$1,416 13	\$4 92	\$1,800 00	\$388 79
Agriculture, . . . . .	5,058 48	2,494 49	2,100 00	—463 99
Asparagus, . . . . .	757 60	—	700 00	—57 60
Botanical, . . . . .	1,895 80	50 00	1,500 00	—345 80
Chemical, . . . . .	10,252 46	10,013 33	1,100 00	860 87
Cranberry, . . . . .	2,886 76	2,676 86	3,000 00	2,790 10
Entomology, . . . . .	556 56	4 50	700 00	147 94
Feed inspection, . . . . .	5,897 93	6,018 67	—	1,018 14
Fertilizer inspection, . . . . .	9,744 92	11,112 00	—	2,853 70
Freight and express, . . . . .	532 56	24 55	300 00	—208 01
Graves orchard, . . . . .	789 08	129 25	800 00	140 17
Horticultural, . . . . .	1,936 83	11 46	1,350 00	—575 37
Library, . . . . .	248 75	—	300 00	51 25
Meteorology, . . . . .	374 24	—	375 00	76
Poultry, . . . . .	1,066 63	4 17	900 00	—162 46
Publications, . . . . .	912 47	—	1,700 00	787 53
Salaries, . . . . .	36,202 83	18 67	37,015 86	831 70
Treasurer's office, . . . . .	364 44	—	350 00	—14 44
Veterinary, . . . . .	597 15	—	725 00	127 85
Hatch fund, . . . . .	—	15,000 00	—	—
Adams fund, . . . . .	—	15,000 00	—	—
State fund, . . . . .	—	20,000 00	—	—
Miscellaneous, . . . . .	96 30	160 00	—	—
Totals, . . . . .	\$81,587 92	\$82,722 87	\$54,715 86	\$8,171 13
Balance on hand beginning fiscal year Dec. 1, 1913, . . . . .	—	7,151 90	—	—
Balance on hand Nov. 30, 1914, . . . . .	8,298 67	—	—	—
	\$89,874 77	\$89,874 77	\$54,715 86	\$8,171 13

*Comparative Disbursements and Receipts, 1913-14.*

ACCOUNTS.	DISBURSEMENTS.		RECEIPTS.	
	1913.	1914.	1913.	1914.
Administration, . . . . .	\$860 79	\$1,416 13	\$4 54	\$4 92
Agriculture, . . . . .	4,841 79	5,058 48	2,746 36	2,494 49
Asparagus, . . . . .	483 27	757 60	—	—
Botanical, . . . . .	1,672 90	1,895 80	—	50 00
Chemical, . . . . .	9,362 54	10,252 46	9,129 76	10,013 33
Cranberry, . . . . .	3,135 53	2,886 76	5,884 50	2,676 86
Entomology, . . . . .	425 96	556 56	3 20	4 50
Feed inspection, . . . . .	6,184 05	5,897 93	6,000 00	6,018 67
Fertilizer inspection, . . . . .	10,560 77	9,744 92	10,580 00	11,112 00
Freight and express, . . . . .	248 24	532 56	56	24 55
Graves orchard, . . . . .	466 93	789 08	399 04	129 25
Horticultural, . . . . .	1,492 20	1,936 83	78 20	11 46
Library, . . . . .	64 00	248 75	—	—
Meteorology, . . . . .	299 27	374 24	—	—
Poultry, . . . . .	910 51	1,066 63	—	4 17
Publications, . . . . .	978 37	912 47	—	—
Salaries, . . . . .	32,679 14	36,202 83	—	18 67
Treasurer's office, . . . . .	373 27	364 44	—	—
Veterinary, . . . . .	718 02	597 15	—	—
Hatch fund, . . . . .	—	—	15,000 00	15,000 00
Adams fund, . . . . .	—	—	15,000 00	15,000 00
State fund, . . . . .	—	—	15,000 00	20,000 00
Miscellaneous, . . . . .	—	96 30	—	160 00
Totals, . . . . .	\$75,757 55	\$81,587 92	\$79,825 16	\$82,722 87
Balance beginning fiscal year, . . . . .	—	—	3,084 29	7,151 90
Balance on hand at close of fiscal year, . . . . .	7,151 90	8,298 67	—	—
	\$82,909 45	\$89,874 77	\$82,909 45	\$89,874 77

EXPERIMENT STATION — *Concluded.*  
*Analysis of Experiment Station Accounts.*

	Adams Fund.	Fertilizer Law.	Feed Law.	Hatch Fund.	State Fund.	Totals.
Salaries, . . . . .	\$13,905 26	\$6,354 35	\$3,778 30	\$12,828 95	\$9,468 62	\$46,335 48
Labor, . . . . .	564 29	762 94	128 77	930 56	14,087 37	16,473 93
Publication, . . . . .	—	813 27	1,048 96	92 14	570 09	2,524 46
Postage and stationery, . . . . .	12 52	120 42	28 60	2 53	1,207 15	1,371 22
Freight and express, . . . . .	—	39 93	9 87	—	549 05	598 85
Heat, light, water and power, . . . . .	—	191 60	38 38	8 63	202 31	440 92
Chemistry and laboratory supplies, . . . . .	139 07	554 88	177 55	115 06	456 41	1,442 97
Seeds, plants and sundry supplies, . . . . .	302 23	49 28	18 23	65 65	1,682 10	2,117 49
Fertilizers, . . . . .	123 33	50	—	675 16	373 72	1,172 71
Feeding stuffs, . . . . .	—	—	—	—	1,402 18	1,402 18
Library, . . . . .	20 34	6 00	—	12 71	698 53	737 58
Tools, machinery and ap- pliances, . . . . .	—	3 00	—	29 60	546 66	579 26
Furniture and fixtures, . . . . .	3 36	—	35 00	—	508 48	546 84
Scientific apparatus and specimens, . . . . .	36 51	38 23	20 50	11 75	634 48	741 47
Live stock, . . . . .	—	—	—	41 00	175 55	216 55
Traveling expenses, . . . . .	82 06	752 01	488 18	—	2,075 24	3,397 49
Contingent expenses, . . . . .	—	—	80 00	—	97 77	177 77
Buildings and land, . . . . .	19 65	58 51	45 59	—	1,087 01	1,210 76
Miscellaneous, . . . . .	—	—	—	—	99 99	99 99
	\$15,208 62	\$9,744 92	\$5,897 93	\$14,813 74	\$35,922 71	\$81,587 92

*Summary.*

	Disbursements.	Receipts.
Cash on hand Dec. 1, 1913, . . . . .	—	\$8,298 67
Receipts from State Treasurer, . . . . .	—	26,000 00
Receipts from United States Treasurer, . . . . .	—	30,000 00
Receipts from other sources, . . . . .	—	26,722 87
Total disbursements, . . . . .	\$81,587 92	—
Bills receivable Nov. 30, 1914, . . . . .	\$81,587 92	\$91,021 44
Bills payable Nov. 30, 1914, . . . . .	1,002 33	945 25
Balance, . . . . .	9,376 39	—
	\$91,966 60	\$91,966 69

EXTENSION SERVICE.

*Disbursements and Receipts.*

ACCOUNTS.	Disburse- ments.	Receipts.	Apportion- ment.	Balance.
Administration, . . . . .	\$2,321 53	\$34 14	\$2,400 00	\$112 61
Agricultural education, . . . . .	3,351 27	121 55	2,500 00	—729 72
Agricultural economics, . . . . .	1,029 13	139 84	800 00	—89 29
Animal husbandry, . . . . .	625 05	64 80	683 33	123 08
Auto. Dem. outfit, . . . . .	813 30	15 56	1,150 00	352 26
Apple packing school, . . . . .	65 70	280 00	100 00	314 30
Beekeeping, . . . . .	49 47	—	200 00	150 53
Boys' camp, . . . . .	804 51	393 00	200 00	—211 51
Civic improvement, . . . . .	734 02	132 49	600 00	—1 53



EXTENSION SERVICE — *Continued.*  
*Disbursements and Receipts — Concluded.*

ACCOUNTS.	Disbursements.	Receipts.	Apportionment.	Balance.
Community service, . . . . .	\$672 69	\$7 70	\$600 00	—\$64 99
Conference rural social workers, . . . . .	563 48	—	500 00	—63 48
Correspondence courses, . . . . .	1,264 86	832 86	400 00	—32 00
County agents, . . . . .	166 83	—	200 00	33 17
Dairying, . . . . .	305 57	—	283 33	—22 24
Director's office, . . . . .	1,810 42	70 82	1,900 00	160 40
Farm management, . . . . .	1,131 49	34 33	1,276 67	179 51
Farmers' week, . . . . .	1,082 16	84 85	900 00	—97 31
Home economics, . . . . .	707 28	79 85	912 50	285 07
Itinerary instruction, . . . . .	2,481 01	905 25	1,600 00	24 24
Library extension, . . . . .	199 43	—	200 00	57
M. A. C. Improvement Association, . . . . .	132 65	71 46	100 00	38 81
Pomology, . . . . .	902 73	7 30	1,083 33	187 90
Poultry convention, . . . . .	328 92	12 00	200 00	—116 92
Poultry husbandry, . . . . .	132 65	8 02	200 00	75 37
Physical education, . . . . .	427 74	—	208 34	—219 40
Salaries, . . . . .	28,614 13	45 00	28,807 21	238 08
Summer school, . . . . .	3,316 78	738 45	2,500 00	—78 33
Ten weeks' school, . . . . .	1,942 16	944 00	1,500 00	501 84
Tree warden's school, . . . . .	127 80	—	100 00	—27 80
Publishing and printing, . . . . .	—	—	208 34	208 34
Furniture and fixtures, . . . . .	—	—	208 33	208 33
Contingent expenses, . . . . .	—	—	98 62	98 62
From State Treasurer, . . . . .	—	50,000 00	—	—
From United States Treasurer, . . . . .	—	5,000 00	—	—
Smith-Lever balance, . . . . .	—	—	—	833 33
Unapportioned balance, . . . . .	—	—	—	8,323 88
Totals, . . . . .	\$56,104 76	\$60,023 27	\$52,620 00	\$10,695 72
Balance beginning fiscal year Dec. 1, 1913, . . . . .	—	6,777 21	—	—
Balance on hand Nov. 30, 1914, . . . . .	10,695 72	—	—	—
	\$66,800 48	\$66,800 48	—	—

*Summary.*

	Disbursements.	Receipts.
Balance Dec. 1, 1913, . . . . .	—	\$6,777 21
Receipts Nov. 30, 1914, . . . . .	—	5,023 27
Received from State Treasurer, . . . . .	—	50,000 00
Received from U. S. Treasurer, . . . . .	—	5,000 00
Disbursements to Nov. 30, 1914, . . . . .	\$56,104 76	—
Bills receivable Dec. 1, 1913, deducted, . . . . .	\$56,104 76	\$66,800 48
Bills payable Dec. 1, 1913, deducted, . . . . .	505 96	133 29
	\$56,610 72	\$66,667 19
Bills receivable Nov. 30, 1914, . . . . .	—	899 26
Bills payable Nov. 30, 1914, . . . . .	468 87	—
Balance, . . . . .	10,486 86	—
	\$67,566 45	\$67,566 45

EXTENSION SERVICE — Concluded.  
Analysis of Extension Service Disbursements.

	Travel.	Equipment.	Laboratory Expense.	Printing.	Office Supplies.	Instruction and Lectures.	Salaries.	Miscellaneous.	Totals.
Administration, . . . . .	\$1,042 65	\$101 45	—	\$884 25	—	—	\$28,614 13	\$293 18	\$30,935 66
Agricultural education, . . . . .	743 99	1,337 66	—	—	\$14 66	—	—	1,254 96	3,351 27
Agricultural economics, . . . . .	686 70	342 43	—	—	—	—	—	—	1,029 13
Animal husbandry, . . . . .	406 71	218 34	—	—	—	—	—	—	625 05
Auto. Dem. outfit, . . . . .	514 10	101 51	—	—	2 00	—	—	—	813 30
Apple packing school, . . . . .	3 44	—	—	—	—	—	—	—	65 70
Beekeeping, . . . . .	—	27 30	—	—	—	—	—	—	49 47
Boys' Camp, . . . . .	70 47	275 49	—	—	—	—	—	—	804 51
Civic improvement, . . . . .	195 82	538 20	—	—	—	—	—	—	734 02
Community service, . . . . .	593 20	79 49	—	—	—	—	—	—	672 69
Conference rural social workers, . . . . .	300 49	262 99	—	—	—	—	—	—	563 48
Correspondence courses, . . . . .	106 12	201 02	—	—	674 93	—	—	—	1,264 86
County agents, . . . . .	166 83	—	—	—	—	—	—	—	166 83
Dairying, . . . . .	158 29	147 28	—	—	—	—	—	—	305 57
Director's office, . . . . .	20 00	476 63	—	—	1,094 39	—	—	—	1,810 42
Farm management, . . . . .	716 80	414 63	—	—	704 20	—	—	—	1,131 49
Farmer's Week, . . . . .	377 96	—	—	—	—	—	—	—	1,082 16
Home economics, . . . . .	478 18	229 10	—	—	—	—	—	—	707 28
Itinerant instruction, . . . . .	1,442 14	1,038 87	—	—	—	—	—	—	2,481 01
Library extension, . . . . .	—	199 43	—	—	—	—	—	—	199 43
M. A. C. Improvement Association, . . . . .	21 35	110 85	—	—	—	—	—	—	132 65
Pomology, . . . . .	485 88	416 85	—	—	—	—	—	—	902 73
Poultry convention, . . . . .	64 42	264 50	—	—	—	—	—	—	328 92
Poultry husbandry, . . . . .	103 15	29 50	—	—	—	—	—	—	132 65
Physical education, . . . . .	357 74	70 00	—	—	—	—	—	—	427 74
Summer school, . . . . .	220 81	—	—	225 98	68 50	\$2,259 48	—	542 01	3,316 78
Ten weeks' school, . . . . .	36 17	—	\$47 15	253 96	2 70	1,538 86	—	63 32	1,942 16
Tree warden's school, . . . . .	148 07	—	—	—	—	—	—	79 73	127 80
	\$9,361 54	\$6,883 52	\$47 15	\$1,364 19	\$2,561 38	\$3,798 34	\$28,614 13	\$3,474 51	\$56,104 76

SPECIAL APPROPRIATIONS.

NAME OF APPROPRIATION.	Date made.	Amount of Apportionment.	Amount previously expended.	Amount expended during Fiscal Year.	Amount expended to Date.	Amount received from State Treasurer.	Balance on Hand with State Treasurer.
Sewers, . . . . .	1912	\$10,000 00	\$9,240 55	\$749 45	\$10,000 00	\$10,000 00	-
Miscellaneous improvements and repairs, . . . . .	1913	26,000 00	16,550 55	9,449 45	26,000 00	26,000 00	-
Addition to French Hall, . . . . .	1913	35,000 00	4,753 86	29,966 37	34,720 23	34,720 23	\$279 77
Sewers, . . . . .	1914	9,200 00	-	-	-	9,200 00	-
Hospital, . . . . .	1913	15,000 00	-	1,947 52	1,947 52	1,947 52	13,852 48
Agricultural building, . . . . .	1914	210,000 00	-	16,194 75	16,194 75	16,194 75	133,805 25
		\$305,200 00	\$30,554 96	\$58,307 54	\$87,862 50	\$98,062 50	\$207,937 50

## INVENTORY — REAL ESTATE.

*Land (Estimated Value).*

Baker place, . . . . .	\$2,500 00
Bangs place, . . . . .	2,350 00
Clark place, . . . . .	4,500 00
College farm, . . . . .	37,000 00
Cranberry land, . . . . .	11,025 00
Harlow farm, . . . . .	3,284 63
Kellogg farm, . . . . .	5,868 45
Louisa Baker place, . . . . .	5,636 91
Old creamery place, . . . . .	1,000 00
Pelham quarry, . . . . .	500 00
Westcott place, . . . . .	2,250 00
Allen place, . . . . .	500 00
Charmbury place, . . . . .	450 00
Loomis place, . . . . .	415 00
Hawley & Brown place, . . . . .	675 00
Newell farm, . . . . .	2,800 00
	<hr/>
	\$80,754 99

*College Buildings (Estimated Value).*

Apiary, . . . . .	\$3,000 00
Animal husbandry building, . . . . .	10,000 00
Chemical laboratory, . . . . .	8,000 00
Clark hall, . . . . .	67,500 00
Cold-storage laboratory, . . . . .	12,000 00
Dairy building, . . . . .	75,000 00
Dairy barn and storage, . . . . .	30,000 00
Dining hall, . . . . .	60,000 00
Drill hall and gun shed, . . . . .	10,000 00
Durfee range and glass houses, old, . . . . .	10,000 00
Durfee range and glass houses, new, . . . . .	15,000 00
Entomology building, . . . . .	80,000 00
Farm bungalow, . . . . .	2,100 00
Farmhouse, . . . . .	2,500 00
French Hall, . . . . .	50,000 00
Horse barn, . . . . .	5,000 00
Horticultural barn, . . . . .	2,500 00
Horticultural tool shed, . . . . .	2,000 00
Machinery barn, . . . . .	4,000 00
Mathematical building, . . . . .	6,000 00
North dormitory, . . . . .	25,000 00
Physics laboratory, . . . . .	5,500 00
Piggery, . . . . .	3,000 00
Poultry breeding houses, . . . . .	1,600 00
Poultry brooder house, . . . . .	1,000 00
Poultry incubator cellar and demonstration building, . . . . .	1,400 00
Poultry laboratory, . . . . .	1,300 00
Poultry laying house, . . . . .	1,800 00
Poultry mechanics and storage building, . . . . .	1,900 00
Power plant and storage building, . . . . .	18,500 00
President's house, . . . . .	12,000 00

Quarantine barn, . . . . .	\$200 00
Sheep shed, . . . . .	1,400 00
Small plant house, with vegetable cellar and cold grapery, . . . . .	4,700 00
South dormitory, . . . . .	35,000 00
Stone chapel, . . . . .	30,000 00
Three houses on Stockbridge road, . . . . .	5,000 00
Veterinary laboratory and stable, . . . . .	23,500 00
Waiting station, . . . . .	500 00
Wilder Hall, . . . . .	37,500 00
Young stock barn, . . . . .	6,500 00
	<hr/>
	\$671,900 00

*College Equipment (Estimated Value).*

Administrative division: —

Dean's office, . . . . .	\$606 55
President's office, . . . . .	1,548 00
Registrar's office, . . . . .	861 00
Treasurer's office, . . . . .	2,458 41

Agricultural division: —

Agronomy, . . . . .	1,598 14
Animal husbandry, . . . . .	913 47
Dairy, . . . . .	11,904 89
Farm administration, . . . . .	1,158 34
Farm department, . . . . .	35,199 89
Poultry, . . . . .	3,752 59
Rural engineering, . . . . .	199 49

Dining hall, . . . . .	6,305 48
Extension, . . . . .	6,340 53

General science: —

Apiary, . . . . .	1,691 34
Botanical, . . . . .	9,818 63
Chemical, . . . . .	12,298 05
Entomology, . . . . .	6,406 18
Microbiology, . . . . .	4,585 75
Mathematics, . . . . .	2,543 70
History and political science, . . . . .	20 75
Physics, . . . . .	3,905 77
Veterinary, . . . . .	9,361 40
Zoölogical laboratory, . . . . .	9,449 52
Zoölogical museum, . . . . .	6,511 05

Graduate school, . . . . .	78 28
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Horticultural division: —

Floriculture, . . . . .	6,989 72
Forestry, . . . . .	1,546 57
General horticulture, . . . . .	8,830 50
Grounds, . . . . .	760 47
Landscape gardening, . . . . .	5,071 21
Market gardening, . . . . .	1,144 33
Pomology, . . . . .	4,797 62

Humanities, division of: —

Economics and sociology, . . . . .	97 87
Language and literature, . . . . .	248 15

Library, . . . . .	77,795 85
Military, . . . . .	1,492 42

## Operating and maintenance:—

College supply, . . . . .	\$610 41
Fire apparatus, . . . . .	1,673 80
General maintenance, . . . . .	85,951 53
Equipment, . . . . .	\$77,857 10
Carpentry and masonry supplies, . . . . .	2,748 62
Electrical supplies, . . . . .	1,408 89
Heating and plumbing supplies, . . . . .	3,192 40
Painting supplies, . . . . .	744 52
Janitors' supplies, . . . . .	368 92
Sewer line, . . . . .	10,000 00
Water mains, . . . . .	10,545 39
Physical education, . . . . .	2,729 98
Rural social science:—	
Agricultural economics, . . . . .	350 00
Agricultural education, . . . . .	856 94
Rural social service, . . . . .	101 75
Textbooks, . . . . .	565 31
Trophy room, . . . . .	1,647 10
	<hr/>
	\$363,693 04

*Experiment Station Buildings (Estimated Value).*

Agricultural laboratory, . . . . .	\$15,000 00
Agricultural barns, . . . . .	5,000 00
Agricultural farmhouse, . . . . .	1,500 00
Agricultural glass house, . . . . .	500 00
Cranberry buildings, . . . . .	2,800 00
Plant and animal chemistry laboratory, . . . . .	30,000 00
Plant and animal chemistry barns, . . . . .	4,000 00
Plant and animal chemistry dairy, . . . . .	2,000 00
Six poultry houses, . . . . .	600 00
Entomological laboratory and glass house, . . . . .	850 00
	<hr/>
	\$62,250 00

*Experiment Station Equipment (Estimated Value).*

Agricultural laboratory, . . . . .	\$6,406 70
Botanical laboratory, . . . . .	5,879 40
Chemical laboratory, . . . . .	17,304 08
Cranberry station, . . . . .	3,075 74
Director's office, . . . . .	4,313 61
Entomological laboratory, . . . . .	24,881 28
Horticultural laboratory, . . . . .	2,006 00
Meteorology laboratory, . . . . .	1,010 00
Poultry department, . . . . .	2,242 35
Treasurer's office, . . . . .	766 50
Veterinary laboratory, . . . . .	150 00
	<hr/>
	\$68,035 66

*Inventory Summary.*

Land, . . . . .	\$80,754 99
College buildings, . . . . .	671,900 00
College equipment, . . . . .	363,693 04
Experiment station buildings, . . . . .	62,273 00
Experiment station equipment, . . . . .	68,035 66
	<hr/>
	\$1,246,656 69

## STUDENTS' TRUST FUND ACCOUNTS.

	Disbursements for Year ending Nov. 30, 1914.	Receipts for Year ending Nov. 30, 1914.	Balance on Hand.	Balance brought forward Dec. 1, 1913.
Athletic, . . . . .	\$10,737 45	\$9,221 03	\$789 27	\$2,305 69
College signal, . . . . .	2,381 75	2,206 81	241 01	415 95
Dining hall, . . . . .	58,401 07	57,812 19	—365 37	223 51
Keys, . . . . .	67 75	66 75	68 25	69 25
Students' deposits, . . . . .	11,952 46	11,195 69	1,720 88	2,477 65
Social Union, . . . . .	900 72	864 16	495 21	531 77
Textbooks, . . . . .	4,630 85	4,896 68	732 05	466 22
Athletic field, . . . . .	8,137 80	8,129 31	—8 49	—
Uniforms, . . . . .	4,391 41	3,281 25	3,025 24	4,135 40
1913 index, . . . . .	—	—	7 42	7 42
1914 index, . . . . .	16 36	11 00	—	5 36
1915 index, . . . . .	1,201 89	1,173 75	8 78	36 92
1916 index, . . . . .	378 65	378 72	07	—
Totals, . . . . .	\$103,198 16	\$99,237 34	\$6,714 32	\$10,675 14
Balance on hand Dec. 1, 1913, . . . . .	—	10,675 14	—	—
Balance on hand Nov. 30, 1914, . . . . .	6,714 32	—	—	—
	\$109,912 48	\$109,912 48	—	—

## DETAILED STATEMENT OF DINING HALL.

	Liabilities.	Resources.
Dec. 1, 1913, credit balance, . . . . .	—	\$223 51
Nov. 30, 1914, total disbursements, . . . . .	\$58,401 07	—
Nov. 30, 1914, outstanding bills, . . . . .	2,410 25	—
Nov. 30, 1914, total collections, . . . . .	—	57,812 19
Nov. 30, 1914, accounts outstanding, . . . . .	—	235 40
Nov. 30, 1914, inventory, . . . . .	—	2,883 71
Nov. 30, 1914, balance, . . . . .	343 49	—
	\$61,154 81	\$61,154 81

ENDOWMENT FUND. <sup>1</sup>

	Principal.	Income.
United States grant (5 per cent.), . . . . .	\$219,000 00	\$7,300 00
Commonwealth grant (3½ per cent.), . . . . .	142,000 00	3,313 33
	—	\$10,613 32

<sup>1</sup> This fund is in the hands of the State Treasurer, and the Massachusetts Agricultural College receives two-thirds of the income from the same.

## BENEFICIARY FUNDS.

*Burnham Emergency Fund.*

	Market Value Dec. 1, 1914.	Par Value.	Income.
Two bonds American Telephone and Telegraph Company 4s, at \$875, . . . . .	\$1,750 00	\$2,000 00	\$80 00
Two bonds Western Electric Company 5s, at \$1,000, . . . . .	2,000 00	2,000 00	100 00
	\$3,750 00	\$4,000 00	\$180 00
Overdraft Dec. 1, 1913, . . . . .	-	-	-39 45
Cash on hand Dec. 1, 1914, . . . . .	-	-	\$140 55

## LIBRARY FUND.

Five bonds New York Central & Hudson River Railroad Company 4s, at \$880, . . . . .	\$4,400 00	\$5,000 00	\$200 00
Five bonds Lake Shore & Michigan Southern Railroad Company 4s, at \$900, . . . . .	4,500 00	5,000 00	200 00
Two shares New York Central & Hudson River Railroad Company stock, at \$88, . . . . .	176 00	200 00	10 00
Amherst Savings Bank, deposit, . . . . .	167 77	167 77	7 09
	\$9,243 77	\$10,367 77	\$417 09
Nov. 28, 1914, transferred to college library account, . . . . .	-	-	417 09

## SPECIAL FUNDS.

*Endowed Labor Fund (the Gift of a Friend of the College).*

Two bonds American Telephone and Telegraph Company 4s, at \$875, . . . . .	\$1,750 00	\$2,000 00	\$80 00
Two bonds Lake Shore & Michigan Southern Railroad Company 4s, at \$900, . . . . .	1,800 00	2,000 00	80 00
One bond New York Central Railroad debenture 4s, . . . . .	880 00	1,000 00	40 00
Amherst Savings Bank, deposit, . . . . .	143 39	143 39	6 07
One bond Metropolitan Street Railway, Kansas City Company 5s, at . . . . .	950 00	1,000 00	60 00
	-	\$6,143 39	\$266 07
Unexpended balance Dec. 1, 1913, . . . . .	-	-	758 83
Cash on hand Dec. 1, 1914, . . . . .	-	-	\$1,024 90

*Whiting Street Scholarship Fund.*

One bond New York Central debenture 4s, . . . . .	\$880 00	\$1,000 00	\$40 00
Amherst Savings Bank, deposit, . . . . .	271 64	271 64	11 51
	-	\$1,271 64	\$51 51
Unexpended balance Dec. 1, 1913, . . . . .	-	-	84 65
Cash on hand Dec. 1, 1914, . . . . .	-	-	\$136 16



SPECIAL FUNDS — *Continued.**Hills Fund.*

	Market Value Dec. 1, 1914.	Par Value.	Income.
One bond American Telephone and Telegraph Company 4s, at	\$875 00	\$1,000 00	\$40 00
One bond New York Central & Hudson River Railroad debenture 4s, at	880 00	1,000 00	40 00
One bond New York Central & Hudson River Railroad debenture 3½s, at	800 00	1,000 00	35 00
Two bonds Metropolitan Street Railway of Kansas City 5s, at \$950,	1,900 00	2,000 00	120 00
Three bonds Pacific Telephone and Telegraph Company 5s, at \$950,	2,850 00	3,000 00	150 00
One bond Western Electric Company 5s, at	950 00	1,000 00	50 00
Boston & Albany Railroad stocks, 3½% shares, at \$180,	652 50	362 50	31 68
Amherst Savings Bank, deposit,	72 75	72 75	3 06
Electric Securities Company bonds, 1½%, at \$1,000,	1,121 00	1,180 00	59 00
	\$10,101 25	\$10,615 25	\$528 74
Unexpended balance Dec. 1, 1913,	—	—	544 34
	—	—	\$1,073 08
Disbursements by the Botanical Department for fiscal year ending Nov. 30, 1914,	—	—	47 20
Cash on hand Dec. 1, 1914,	—	—	\$1,025 88

*Mary Robinson Fund.*

Boston & Albany Railroad stock, ¾ share, at \$180,	\$67 50	\$38 00	\$3 32
Electric Securities Company bonds, 1½% share, at \$1,000,	779 00	820 00	41 00
	\$846 50	\$858 00	\$44 32
Unexpended balance Dec. 1, 1913,	—	—	125 32
	—	—	\$169 64
Disbursements for fiscal year ending Nov. 30, 1914,	—	—	13 75
Cash on hand Dec. 1, 1914,	—	—	\$155 89

*Grinnell Prize Fund.*

Ten shares New York Central & Hudson River Railroad stock, at \$82,	\$820 00	\$1,000 00	\$50 00
Unexpended balance Dec. 1, 1913,	—	—	195 74
	—	—	\$245 74
Disbursements for prizes,	—	—	50 00
Cash on hand Dec. 1, 1914,	—	—	\$195 74

*Gassett Scholarship Fund.*

One bond New York Central & Hudson River Railroad debenture 4s,	\$880 00	\$1,000 00	\$40 00
Amherst Savings Bank, deposit,	—	11 64	46
	—	\$1,011 64	\$40 46
Unexpended balance Dec. 1, 1913,	—	—	71 39
	—	—	\$111 85
Disbursements for fiscal year ending Nov. 30, 1914,	—	—	10 00
Cash on hand Dec. 1, 1914,	—	—	\$101 85

SPECIAL FUNDS — *Concluded.**Massachusetts Agricultural College (Investment).*

	Market Value Dec. 1, 1914.	Par Value.	Income.
One share New York Central & Hudson River Railroad stock,	\$88 00	\$100 00	\$5 00
Unexpended balance Dec. 1, 1913, . . . . .	-	-	65 45
Cash on hand Dec. 1, 1914, . . . . .	-	-	\$70 45

*Danforth Keyes Bangs Fund.*

Two bonds Pacific Telephone and Telegraph Company 5s, at \$950,	\$1,900 00	\$2,000 00	\$100 00
Two bonds Union Electric Light and Power Company 5s, at \$950,	1,900 00	2,000 00	100 00
Two bonds American Telephone and Telegraph Company 4s, at \$875,	1,750 00	2,000 00	80 00
Interest from student loans, . . . . .	-	-	29 86
Unexpended balance Dec. 1, 1913, . . . . .	-	\$6,000 00	\$309 86
Total loans made to students during fiscal year,	\$1,688 00	-	380 35
Cash received on account of student loans,	1,379 00	-	\$690 21
Excess of loans made, over accounts paid by students, . . . . .	-	-	309 00
Cash on hand Dec. 1, 1914, . . . . .	-	-	\$381 21

*John C. Cutter Fund.*

One bond Pacific Telephone and Telegraph Company 5s,	\$950 00	\$1,000 00	\$50 00
Unexpended balance Dec. 1, 1913, . . . . .	-	-	13 12
Disbursements for fiscal year to date, . . . . .	-	-	\$63 12
Cash on hand Dec. 1, 1914, . . . . .	-	-	32 87
			\$30 25

SUMMARY OF BALANCES ON HAND OF THE INCOME FROM FUNDS HELD IN  
TRUST BY THE MASSACHUSETTS AGRICULTURAL COLLEGE.

Burnham emergency, . . . . .	\$140 55
Endowed labor fund, . . . . .	1,024 90
Whiting Street scholarship fund, . . . . .	136 16
Hills fund, . . . . .	1,025 88
Mary Robinson fund, . . . . .	155 89
Grinnell Prize fund, . . . . .	195 74
Gassett scholarship fund, . . . . .	101 85
Massachusetts Agricultural College investment fund, . . . . .	70 45
Danforth Keyes Bangs fund, . . . . .	381 21
John C. Cutter fund, . . . . .	30 25
	\$3,262 88

I hereby certify that I have this day examined the Massachusetts Agricultural College account, as reported by the treasurer, Fred C. Kenney, for the year ending Nov. 30, 1914. All bonds and investments are as represented in the treasurer's report. All disbursements are properly vouched for, and all cash balances are found to be correct.

CHARLES A. GLEASON,

*Auditor.*

HISTORY OF SPECIAL FUNDS.

Burnham emergency fund:—

A bequest of \$5,000 from T. O. H. P. Burnham of Boston, made without any conditions. The trustees of the college directed that \$1,000 of this fund should be used in the purchase of the Newell land and Goessmann library. The fund now shows an investment of . . . . . \$4,000 00

Library fund:—

The library of the college at the present time contains about 41,000 volumes. The income from the fund raised by the alumni and others is devoted to its increase, and additions are made from time to time as the needs of the different departments require. Dec. 27, 1883, William Knowlton gave \$2,000; Jan. 1, 1894, Charles L. Flint gave \$1,000; in 1887 Elizur Smith of Lee, Mass., gave \$1,215. These were the largest bequests and now amount to . . . . . 10,000 00

Endowed labor fund:—

Gift of a friend of the college in 1901, income of which is to be used for the assistance of needy and deserving students, . . . . . 5,000 00

## Whiting Street scholarship:—

Gift of Whiting Street of Northampton, for no special purpose, but to be invested and the income used.

This fund is now used exclusively for scholarship, . \$1,000 00

## Hills fund:—

Gift of Leonard M. and Henry F. Hills of Amherst, Mass., in 1867, to establish and maintain a botanic garden, . . . . . 10,000 00

## Mary Robinson fund:—

Gift of Miss Mary Robinson of Medfield, in 1874, for scholarship, . . . . . 1,000 00

## Grinnell prize fund:—

Gift of Hon. Wm. Claffin, to be known as the Grinnell agricultural prize, to be given to the two members of the graduating class who may pass the best oral and written examination in theory and practice of agriculture, given in honor of George B. Grinnell of New York, . . . . . 1,000 00

## Gassett scholarship fund:—

Gift of Henry Gassett of Boston, the income to be used for scholarship, . . . . . 1,000 00

## Massachusetts Agricultural College investment fund:—

Investment made by vote of trustees in 1893; to purchase one share of New York Central & Hudson River Railroad stock. The income from this fund has been allowed to accumulate, . . . . . 100 00

## Danforth Keyes Bangs fund:—

Gift of Louisa A. Baker, of Amherst, Mass., April 14, 1909, the income thereof to be used annually in aiding poor, industrious and deserving students to obtain an education in said college, . . . . . 6,000 00

## John C. Cutter fund:—

Gift of Dr. John C. Cutter, of Worcester, Mass., an alumnus of the college, who died in August, 1909, to be invested by the trustees, and the income to be annually used for the purchase of books on hygiene, . . . . . 1,000 00

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\$41,000 00

## PRIZES.

Special prize, given by the Western Alumni Association to that member of the sophomore class who during his first two years has shown the greatest improvement in scholarship, character and example, . . . . . \$25 00

Animal husbandry. The F. Lothrop Ames prize, given by F. Lothrop Ames, Langwater Farms, North Easton, Mass., consisting of \$150 a year, offered for a period of five years, to be given to the three students standing highest in the work of advanced live stock judging, and to be used in defraying their expenses incurred by participation in the students' judging contest at the National Dairy Show, Chicago. Given in May, 1912, available first in autumn of 1912, and for the four succeeding years, .	\$150 00
Entomology. Special prize in entomology, given by Prof. H. T. Fernald of the Department of Entomology to that member of the class taking Entomology 2, who presents the best collection of insects, . . . . .	5 00
	\$180 00

FRED C. KENNEY,  
*Treasurer.*









The  
Massachusetts Agricultural College  
SHORT COURSES

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ANNOUNCEMENT  
OF  
AGRICULTURAL  
**BOYS' CAMPS**  
In  
Connection with the Regular  
Summer School of Agriculture  
and Country Life



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Vol. VII, No. 3. THE M. A. C. BULLETIN March, 1915

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AMHERST, MASS.

1915

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**ANNOUNCEMENT**  
OF  
**BOYS' CAMPS**

HELD BY  
**THE MASSACHUSETTS  
AGRICULTURAL COLLEGE**

**Amherst, Massachusetts**

July 6 to 30, 1915

**The M. A. C. Bulletin, Volume VII, Number 3**

Published six times a year by  
The Massachusetts Agricultural College  
January, February, March, May, September, October  
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at the Post Office, Amherst, Massachusetts

# APPLICATION—BOYS' CAMP

GIVEN IN CONNECTION WITH THE

## Summer School of Agriculture and Country Life

I hereby apply for admission to the M. A. C. Boys' Camp, to be held,..... Enclosed find \$8.00 to cover cost for the week. In making this application, I agree to abide by any rules laid down for the government of the Camp, and to conduct myself in a gentlemanly manner.

Name.....Date of birth.....

Address: Town.....County.....

Street.....

Do you play a musical instrument?.....What?.....

Can you sing?.....

Have you a camera?.....Can you swim?.....How far?.....

Do you play tennis?.....Baseball?.....What position?.....

What is your hobby?.....

Do you belong to any agricultural club?.....

My height is.....Weight.....

Name of parent or guardian.....

Address of parent or guardian.....

Name of person responsible for your coming.....

Profession.....Address.....

Reference.....Address.....

This application has my approval and consent.

Signed.....

Parent or Guardian.

Date Received.....

Fee.....

Accepted.....



## ANNOUNCEMENT

During the month of July, 1915, the Massachusetts Agricultural College will conduct three agricultural camps for boys in connection with the regular Summer School of Agriculture and Country Life. Each

camp will be of one full week's duration. The college feels it has a direct duty to the boys of the state whose inclinations draw them toward agricultural pursuits. In addition to instruction along agricultural lines there will be a well balanced program of instruction in some of the vital problems of life, and periods will be devoted to athletics and other forms of recreation as shown in the tentative outline of a day's activities. The main purpose of these camps is fourfold:

1. To interest the boy in agriculture and country life. This is the primary object.
2. To impress on the boy his responsibilities as a member of society.
3. To teach the boy clean, wholesome sports, recreation, and proper spirit in competitive contests.
4. To demonstrate the value of a Boys' Camp as an educational factor.

### DATES OF THE CAMPS

**First Camp.**—July 6–July 14.

Registration closes July 1.

**Second Camp.**—July 14–July 22.

Registration closes July 8.

**Third Camp.**—July 22–July 30.

Registration closes July 14.

NOTE.—Those boys who were in the 1913 or 1914 Camps may register for the second camp only.

Only agricultural club prize winners will be admitted to the third camp.



## FACULTY AND SUPERVISORS OF THE BOYS' CAMPS

WILLIAM D. HURD: Director of the Extension Service and Supervisor of Short Courses, M. A. C.

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### Camp Staff

HAROLD M. GORE: M. A. C. 1913: Assistant Physical Director, M. A. C. (In charge of Camps).

SAMUEL R. PARSONS: M. A. C. 1911: Former Colonel M. A. C. Regiment and Instructor in Military Science, M. A. C. Now Instructor Pennsylvania State College.

LEONE E. SMITH: M. A. C. 1914: Supt. Colchester Boys' Club, Colchester, Conn.

JOHN B. MINOR, JR.: M. A. C. 1918: Students Military Instruction Camp, Burlington, Vt., Season 1914.

JOHN J. LEE: Ordnance Sergeant, U. S. Army, retired: Camp Inspector.

PROFESSOR CURRY S. HICKS: Head of the Department of Physical Education, M. A. C., will have general supervision of health and athletics.

The Agricultural Instruction will be given by members of the regular M. A. C. Faculty.

Well-known non-resident lecturers and leaders in boys' work will be secured for other exercises.



*Off for a "Hike"*

### ORGANIZATION OF THE CAMP

#### Selection of Boys

The selection of boys who are to receive the advantages of these camps will be left to the individuals in various organizations which may be interested. Granges,

Y. M. C. A.'s, Churches, Clergymen, Scout Masters, Superintendents and Teachers are urged to select boys who might be benefited by a week of this kind, and to see that they are provided with necessary means in order to attend.

Each camp will be limited to fifty boys.

Boys between the ages of 12 and 17 years only will be admitted.

## Discipline

The camps will be under military discipline. Only those boys who are willing to conduct themselves in the proper manner and observe the rights and comforts of others are invited to join the camp. All members of the camp are required to attend and participate in all meetings on the schedule unless prevented by illness. There are only a few definite rules in connection with the camps.

1. There shall be no firearms in camp.
2. There shall be no smoking.
3. No camper is allowed to leave the college campus without permission.
4. A gentleman always.

## Expenses

Eight dollars will be charged each boy for the week. This registration fee is used primarily for board, to help defray the cost of maintaining the camp and of instruction and supervision.



*"Whittling"*



*"The Bunch"*



*"Champs"*

## What to Bring

The following list is merely offered as a suggestion. Check off each article as you pack up.

Wear to camp your second best clothes. Bring a change of old outer clothing, two heavy double woolen blankets or four heavy single blankets, an old comfortable or heavy quilt. It is necessary to bring the "comfort" as the bunks are made up on wire cots and an old quilt makes an admirable mattress. A rubber poncho, raincoat or oil skins, change of underwear and stockings, a gymnasium suit, running suit or bathing suit, a thick shirt or sweater, towels, comb and brush, toothbrush, handkerchiefs, pajamas or nightgown, notebooks and pencils.

You may also bring sneakers or tennis shoes, baseball equipment, tennis racquet and balls, camera, musical instruments and music, if you have them.

### LOCATION OF THE CAMP

The camp is situated on the M. A. C. College campus just south of the College Armory. The boys sleep in a large tent, 40 by 70 feet, made of army duck. Each boy is provided with a spring wire cot. These cots are grouped into units of six, designated as "tents" and a leader is selected for each.

A smaller tent is used for the commandant's office. The medical outfit of the physical director's office is readily accessible.

Meals are obtained at the College Dining Hall.

### AGRICULTURE

The mornings are given over to practical instruction in Agriculture, Hygiene, Citizenship, etc. The regular instructors of the college give practical talks on various agricultural specialties, these talks being followed by demonstrations and by inspection of the departmental equipment, such as the Dairy, Poultry Plant, Orchards, etc.



*Stock Judging*

Features of the agricultural work are the stock-judging contests, corn-judging contests, operation of the Babcock milk test and similar specialties. The talks by the different instructors are made very practical and the boys are given every opportunity to participate in the various lines of agriculture which are outlined.

### AGRICULTURAL PRIZE WINNERS' WEEK

The Camp which will open Thursday evening, July 22, 1915, and close Friday morning, July 30, 1915, is the Prize Winners' Camp. Those who won third prizes in the hay, corn, potato, market garden, poultry and home economics clubs will be members of this camp as guests of the state and all their expenses will be paid as their reward for club achievement.

Each forenoon and some of the evenings will be devoted to special lines such as poultry husbandry, market gardening, potato



and corn culture, stock judging, illustrated lectures, moving pictures, etc. The afternoons will be largely devoted to recreation.

Thursday, July 29, will be Champions' Day. The first and second prize winners in the same clubs will be present. Champions in the 1911, 1912, and 1913 clubs will be invited to be present and participate in the exercises. There will be a Field Meet with athletic events in the afternoon. In the evening a mass meeting will be held at which some of the club members will speak and short addresses will be made by men from State and National Departments. At this meeting diplomas of merit will be presented by President Kenyon L. Butterfield of the College. The officers for 1915 and 1916 will be announced.

The girls who have won prizes in the club work during the past year will be organized into a separate camp under the supervision of Miss Ethel H. Nash on the same plan as the Boys' Camp, July 22-July 30.

### ATHLETICS

While the forenoons are given over to study the afternoons are taken up with games and recreation. Every boy is encouraged to take part and emphasis is laid on the principles of fair play and true sportsmanship. The campers are divided into three groups according to weight, and competition among the boys is thus made fair and equal.

The events in the field and track meet are the 100 yard dash and the 50 yard dash (for juniors); the broad jump, 60 yard hurdles, high jump, discus throwing, potato race, and the shot put (for seniors and intermediates only). Ribbons are awarded for the first three places. The camp baseball teams have had enviable records the last two years in games with the Amherst Boy Scouts, Summer School team and other local teams. Campers should bring gloves, masks, and baseballs with them. There are two tennis courts in close proximity to the camp which are reserved for the use of the boys. The college baseball diamond is also available and it is very probable that a part at least of the new athletic field can be used this summer.

Open handicap tennis tournaments are conducted during each camp.



### SWIMMING AND AQUATICS

Aquatic meets are held during each camp and include the following events: 30 yard dash, fancy swimming, dive for form, and plunge for distance.

Several trips are made to Hollow Pond, North Amherst, during the week. Every precaution against accident is observed and the swimming trips are thoroughly supervised. Instruction in swimming is given to those desiring it. A volunteer life saving corp is organized among the best swimmers of each camp. Practice and demonstration work is given in life saving, and in the various methods of resuscitation.

### HIKES AND TREKS

The over-night hike to the Boy Scout Bungalow in South Amherst has proved very popular. Out of each camp a selected few are given an opportunity of "roughing" it for a day. Instruction is given in camp cookery. One all-day tramp is arranged for each camp, either over the Mount Holyoke Range, to Mount Toby or to Mount Lincoln.



*"Setting Up" Exercises*

### SPECIALTIES

Opportunities are given for those interested to receive instruction under special teachers in basketry, photography, stock judging, whittling, surveying and map reading, wireless telegraphy, wig-wagging, shop work, first aid, rope tying and splicing, seed testing, military drill, bird study, etc.

### CAMPFIRES

Campfire talks by prominent men interested in boys' work form a feature of the evenings in camp. Some of the most prominent men in this kind of work have been secured during the past two years to address the boys. These talks have been one of the most attractive features of the week.

## TENTATIVE PROGRAM OF A DAY AT "BOYS' CAMPS"

- 6.00 A. M. "Reveille"—Setting up exercises, shower baths, dress.  
7.00 A.M. Flag Raising.  
7.15 A.M. Breakfast—Chapel exercises at table, announcements for the day.  
8.00 A.M. Camp Duties—"picking up."  
8.20 A.M. Agricultural Lesson.  
10.00 A.M. "Prepare for Inspection"—Make beds.  
10.20 A.M. Morning Talk.  
12.00 M. Tent Inspection.  
12.30 P.M. Dinner.  
1.00 P.M. "Quiet Hour"—Rest in tent, read, write letters home, study in library.  
2.00 P.M. Games and Recreation—Tennis, baseball, track, swims.  
4.30 P.M. Afternoon Specialties—Basketry, surveying, photography, stock judging, etc.  
6.00 P.M. Supper.  
6.45 P.M. "Colors."  
7.00 P.M. Evening Specialty—Games, wig-wagging, "Weatherman," rope-tying, etc.  
7.30 P.M. Evening Lecture or Open Night—Campfire, roasts, vaudevilles, etc.  
9.15 P.M. "Tattoo"—Everybody in tents.—"Camp Newspaper."  
9.30 P.M. "Taps"—Lights out.



*"First-Aid" Instruction*

## SPECIAL EVENTS

Opening of camp	Debates and mock trial
Stock-judging contest	Corn-judging contest
Tennis tournament	Camp vaudeville
Field Day and Track Meet	Tent baseball championship
Camp newspaper	Campfires
Illustrated talks	Camp elections
Over-night hike	Tramps to Mt. Toby and Mt. Lincoln
Camp Minstrels	
Aquatics and Swimming Meet	Circus
Photography contest	Closing night

## WINNERS OF 1914 EVENTS

### Stock-Judging Contest

First camp—RALPH DENNISON—Reading.

Second camp—GORDON NIGHTINGALE—Petersham.

### "Best All-Round Camper"

First camp—WALTER M. HATCH, JR.—Quincy.

Second camp—RUFUS P. CUSHMAN, JR.—Monson.

### Senior Field Meet

First camp—FRANCIS CASWELL—Salem

Second camp—ROBERT HARWOOD—Littleton.

### Intermediate Field Meet

Second camp—HAROLD HASKINS—North Amherst.

### Tennis Tournament

Both camps—WALTER M. HATCH, JR.—Quincy.

### Senior Aquatics

First camp—FRANCIS CASWELL—Salem.

Second camp—ALBERT KNIGHTS—Littleton.

### Intermediate Aquatics

Second camp—ROBERT HOWES

### Junior Aquatics

Second camp—SHERMAN HARDY—Littleton.

## THE REGION SURROUNDING AMHERST

Amherst is one of the most delightful towns in New England, and has long been noted for the natural scenic beauties surrounding it, and as an educational center. It is located in the heart of the Connecticut Valley. The Holyoke range, Mt. Tom, Mt. Holyoke, Mt. Toby, Orient Springs, the Connecticut River, Rattlesnake Gutter, Whately Glen, Old Deerfield, and other places of great scenic beauty and historic interest are within easy walking, trolley or driving distance. The Berkshire and Hampshire Hills country is easily accessible.

The climate is good and usually not excessively warm during the Camps.

## LOCATION OF AND DIRECTIONS FOR REACHING AMHERST

Amherst is ninety-seven miles west of Boston and twenty-five miles from Springfield. It can be reached from Boston over the Boston and Maine Railroad (Southern Division from North Station) or by the Boston and Albany Railroad from South Terminal Station via Palmer, thence to Amherst over the Central Vermont Railroad. Special directions will be sent to all boys who register.

## MISCELLANEOUS INFORMATION

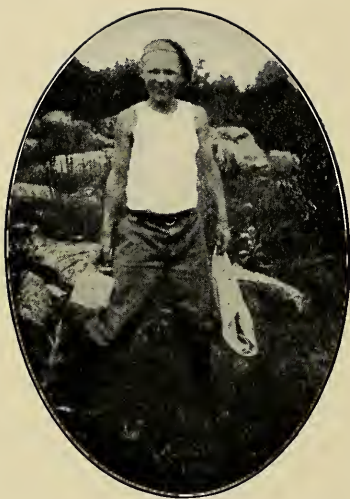
A letter giving more complete information, time at which boys are expected to arrive and various other essential details will be sent to all those who register, a few days prior to the opening of the camp.

For further information relative to the Boys' Camps or the Summer School, address,

WILLIAM D. HURD,  
Supervisor of Short Courses,  
M. A. C., Amherst, Mass.



*"The Round-up"*









# The Massachusetts Agricultural College

SHORT COURSES

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## SUMMER SCHOOLS

1915



AMHERST, MASSACHUSETTS

“THE AMHERST MOVEMENT”



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**SUMMER SCHOOLS**

**1915**

**The Summer School of Agriculture and Country Life**

June 28—July 27

**School for Rural Social Service**

July 13—July 27



**Boys' Agricultural Camps**

First Camp	. . . . .	July 6—July 14
Second Camp	. . . . .	July 14—July 22
Third Camp	. . . . .	July 22—July 30

**School for Library Workers**

July 19—24 Inclusive

**The Poultry Convention**

July 21—23 Inclusive

**Conference on Rural Organization**

July 27—31 Inclusive

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"THE AMHERST MOVEMENT"

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**FACULTY OF THE SUMMER SCHOOLS  
1915**

KENYON L. BUTTERFIELD, A. M., LL. D.

*President of the College*

WILLIAM D. HURD, M. AGR.

*Director of The Extension Service and Supervisor of Short Courses.*

CHARLES R. GREEN, B. AGR.

*Librarian of the College*

F. JOSEPHINE HALL, A. M.

*Adviser for Women*

JOHN L. BYARD Superintendent of Apiary.	<i>Beekeeping</i>
ADA M. CHANDLER, B. A. Library Assistant.	<i>Library School</i>
WALTER W. CHENOWETH Assistant Professor of Pomology.	<i>Pomology</i>
WILLIAM D. CLARK, A. B., M. F. Professor of Forestry.	<i>Forestry</i>
LAURA COMSTOCK Extension Professor of Home Economics.	<i>Home Economics</i>
SAMUEL COONS Instructor in Dairying.	<i>Dairying</i>
PHILIP H. ELWOOD, JR., B. SC. AGR. Extension Instructor in Civic Improvement.	<i>Civic Improvement</i>
REV. WM. F. ENGLISH, PH. D. Pastor, East Windsor, Conn.	<i>Rural Church</i>
R. HAY FERGUSON, B. SC. AGR. Extension Professor of Agricultural Economics.	<i>Agricultural Economics</i>
HENRY T. FERNALD, PH. D. Professor of Entomology.	<i>Entomology</i>
JAMES A. FOORD, M. SC. AGR. Professor of Farm Administration.	<i>Farm Administration</i>
BURTON N. GATES, PH. D. Associate Professor of Beekeeping.	<i>Beekeeping</i>
HELENA T. GOESSMANN, M. PH. Instructor in English.	<i>Library School</i>
HAROLD M. GORE, B. SC. Assistant in Physical Education.	<i>Boys' Camps</i>
JOHN C. GRAHAM, B. SC. Professor of Poultry Husbandry.	<i>Poultry Husbandry</i>

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**“THE AMHERST MOVEMENT”**

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**FACULTY OF THE SUMMER SCHOOLS—Continued**

IDA E. HALL, LL.B. Waltham, Mass.	<i>Plays and Pageants</i>
HARRIET J. HOPKINS, B.Sc. Extension Instructor in Home Economics.	<i>Home Economics</i>
WILLIAM P. B. LOCKWOOD, M.Sc. Professor of Dairying.	<i>Dairying</i>
FREDERICK A. McLAUGHLIN, B.Sc. Instructor in Botany.	<i>Botany</i>
CHARLES J. MAYNARD Naturalist and Lecturer, West Newton, Mass.	<i>Ornithology</i>
ORION A. MORTON Extension Professor of Agricultural Education.	<i>Boys' and Girls' Clubs</i>
EZRA L. MORGAN, A.M. Extension Professor of Community Planning.	<i>Community Planning</i>
ETHEL H. NASH Extension Instructor in Agricultural Education.	<i>Boys' and Girls' Clubs</i>
ARNO H. NEHRLING Associate Professor of Floriculture.	<i>Floriculture</i>
A. VINCENT OSMUN, M.Sc. Associate Professor of Botany.	<i>Botany</i>
SAMUEL R. PARSONS, B.Sc. Instructor, Pennsylvania State College.	<i>Boys' Camps</i>
CHARLES A. PETERS, PH.D. Associate Professor of Inorganic and Soil Chemistry.	<i>Chemistry</i>
ELVIN L. QUAIFFE, B.Sc.AGR. Assistant Professor of Animal Husbandry.	<i>Animal Husbandry</i>
WALTER RUETSCHI Assistant Director of Athletics, New Jersey Public Schools.	<i>Organized Recreation</i>
FREDERICK W. RIED Director of Practical Arts, Framingham (Mass.) Normal School.	<i>Handicrafts</i>
HENRY K. ROWE, PH.D. Newton (Mass.) Theological Seminary.	<i>Rural Church</i>
FRED C. SEARS, M.Sc. Professor of Pomology.	<i>Pomology</i>
HAROLD F. TOMPSON, B.Sc. Acting Head, Department of Market Gardening.	<i>Market Gardening</i>
LEONE E. SMITH, B.Sc. Superintendent Colchester (Conn.) Boys' Club.	<i>Boys' Camps</i>
FRANK A. WAUGH, M.Sc. Professor of Landscape Gardening.	<i>Landscape Gardening</i>

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“THE AMHERST MOVEMENT”

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COMMITTEES OF THE FACULTY OF THE  
SUMMER SCHOOL OF AGRICULTURE  
AND COUNTRY LIFE

Course of Study

PROFESSORS PETERS, GRAHAM, FERNALD, HURD.

Excursions

PROFESSORS OSMUN, WAUGH, HURD.

Social Evenings

PROFESSORS SEARS, HART, RIED, HURD, MISS F. JOSEPHINE HALL.

Athletics and Recreation

PROFESSORS LOCKWOOD, MORGAN, HURD.

So far as possible, the members of the faculty of the Summer Schools are selected from the regular faculty of the College. Where instructors are engaged from other institutions, great care is taken to secure men and women eminent in their respective lines of work.



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## "THE AMHERST MOVEMENT"

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### 1915 SUMMER SCHOOLS

#### CALENDAR

- Monday, June 28.** Registration for Summer School of Agriculture and Country Life.
- June 29.** Classes begin.  
7.30 P.M. Informal Reception.
- June 30.** Afternoon Excursion to "The Orient."
- July 1.** Afternoon Class Excursions and Recreation.  
7.30 P.M. Lecture. Prof. Dallas Lore<sup>1</sup> Sharp, Boston University. Author and Farmer.
- July 2.** 8—11 P.M. Social Evening.
- July 3.** Afternoon Excursion to Mt. Toby.
- July 4.** 5.00 P.M. Vesper Service.
- Monday, July 5.** Community Fourth of July Celebration.
- July 6.** First Boys' Agricultural Camp begins.  
Afternoon Class Excursions and Recreation.  
8—10 P.M. Social Evening.
- July 7.** Afternoon Excursion to The Notch, Bear Mountain, Holyoke Range.
- July 8.** Afternoon Class Excursions and Recreation.  
7.30 P.M. Lecture. "Rural Health Service" (Illustrated). Dr. Frank Overton, Sanitary Supervisor, New York State Department of Health.
- July 9.** 8—11 P.M. Social Evening.
- July 10.** All Day Excursion to Old Deerfield.
- July 11.** 5.00 P.M. Vesper Service.
- Monday, July 12.** Afternoon Class Excursions and Recreation.
- July 13.** 12.00 M. Classes for first two weeks end.  
Registration for School for Rural Social Service.
- July 14.** Classes for second two weeks begin.  
School for Rural Social Service begins.  
First Boys' Camp ends and second camp begins.  
Afternoon Excursion to Sugar Loaf Mountain.
- July 15.** Organized Play and Recreation.  
7.30 P.M. Lecture (Illustrated).  
"Some interesting facts in bird study and bird protection." Edward Howe Forbush, Massachusetts State Ornithologist.



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## "THE AMHERST MOVEMENT"

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- July 16.** Class Excursions and Recreation.  
8—10 P.M. Social Evening.
- July 17.** All-Day Excursion to Mt. Holyoke College,  
Holyoke Paper Mills and Mt. Tom.
- July 18.** 5.00 P.M. Vesper Service.
- Monday, July 19.** Afternoon Class Excursions and Recreation.
- July 20.** Organized Play and Recreation.  
8—10 P.M. Social Evening.
- July 21.** Afternoon Excursion by barges or autos to Whately Glen, Rattlesnake Gutter, or Mt. Lincoln.  
1.30 P.M. Poultry Convention begins.
- July 22.** Poultry Convention all day and evening.  
Second Boys' Camp ends.  
Agricultural Camps for Club Winners begin.  
7.30 P.M. Lecture (see Poultry Convention program).
- July 23.** Poultry Convention.  
8—10 P.M. Social Evening.
- July 24.** All-Day Excursion. (To be announced.)
- July 25.** 5.00 P.M. Vesper Service.
- Monday, July 26.** Afternoon Class Excursions and Recreation.
- July 27.** 12.00 M. All Classes of the Summer School end.  
2.00 P.M. Conference on Rural Organization begins. Reports of Actual Achievements in Massachusetts Towns.
- July 28.** Conference on Rural Organization.  
Subject for the day—Town Policies.
- July 29.** Conference on Rural Organization.  
Subject for the day—County Policies.
- July 30.** Conference on Rural Organization.  
Subject for the day—State Policies.





## SUMMER SCHOOL OF AGRICULTURE AND COUNTRY LIFE

### ANNOUNCEMENT



THE Summer School of Agriculture and Country Life of the Massachusetts Agricultural College will open June 28, for a term of four weeks, and will close July 27. This will be the eighth session of the Summer School. The experience of the past seven years will aid in making material improvements for the session of 1915. The work of the Summer School was designed originally for school teachers, and the attendance has been largely of that class. Special attention will be given to the needs of teachers again this year. It has been found, however, that there are many persons who seek a general knowledge of theoretical and practical agriculture who can come to the college conveniently during the summer season. Extended courses will be offered for

the benefit of such persons also. The courses offered for the current year may be grouped as follows:

1. Courses in practical agriculture and horticulture.
2. Courses in elementary sciences bearing on agriculture and horticulture.
3. Courses in agricultural education.
4. Courses in agricultural economics and rural sociology.
5. Courses in play and recreation.
6. Courses in domestic economy and household science.
7. Groups of courses, arranged especially for rural social workers, but open also to others interested in community development.

From these courses it will be possible to make up programs of work especially suitable to the needs of school teachers, principals, superintendents, school committeemen, farm owners, suburban residents, clergymen, social workers, and those who have only a general interest in agriculture. Persons who are in doubt as to what courses

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## "THE AMHERST MOVEMENT"

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will best suit their needs should correspond with the Supervisor of Short Courses, who will gladly advise in all such matters.

### GROUP A

#### GENERAL AGRICULTURE, ANIMAL HUSBANDRY, DAIRYING

##### 1. Soil Fertility.

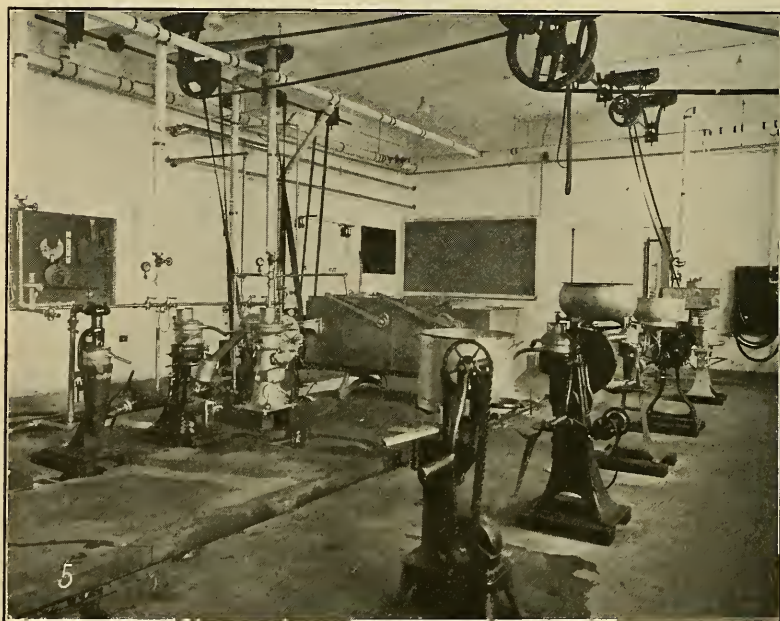
*(Instructor to be announced)*

A systematic study of the factors governing crop production. This course includes a field study of soils of different formations and different textures; a study of tillage, tillage methods, and tillage implements; a study of soil fertility as affected by crop rotations and green manures; and of the economical use of manures, lime and commercial fertilizer. A large part of the work consists of field exercises. Five exercises a week; four weeks.

##### 2. Breeds and Types of Live Stock.

*Professor Quaipe*

As detailed a study as is possible of the different breeds and types of farm animals. The characteristics of draft, coach, roadster and saddle horses are studied with a brief review of the several breeds adapted to each class. The history, characteristics and adaptations of the leading dairy and beef breeds of cattle are discussed. Feeding, especially of dairy cattle for economic milk production and care and management consistent with the successful growing of live stock, receive attention. Time is given to the judging of horses and dairy cattle. The work is made practical throughout. Five exercises a week; four weeks.



*Separator Room—Dairying Laboratory*

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## "THE AMHERST MOVEMENT"

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### 3. Modern Dairying.

*Professor Lockwood*

This course is designed to give an idea of modern dairying. It is practical rather than theoretical, and covers briefly: composition and secretion of milk; principles and methods of creaming; abnormal milk and causes; proper handling of milk and cream on the farm; value of milk as food; relation of milk to public health; handling and care of milk in the home; methods used in production of sanitary and certified milk. Five exercises a week; four weeks.

### 4. Dairy Laboratory.

*Mr. Coons*

Consists of

First week—Two 2-hour periods in Babcock testing.

Second week—Two 2-hour " Market milk work.

Third week—Two 2-hour " Separator work.

Fourth week—Two 2-hour " Butter making.

Students taking this course are required to take Course 3.

### 5. Poultry Breeding and Management.

*Professor Graham*

This covers: Poultry house construction; incubation and brooding; care of poultry in summer; winter egg production; marketing eggs and poultry; poultry diseases. Laboratory work consists of caring for incubators and brooders and managing young chicks, killing, picking, dressing and caponizing. As much practical work as possible is given; this includes poultry carpentry, caring for breeders and layers, also some elementary work in judging. Four lectures and one laboratory period a week; four weeks.

### 6. Farm Management and Farm Accounts.

*Professor Foord*

This course consists largely of a discussion of some of the problems that confront the farmer, and the factors which govern successful farm management. The principles of farm accounting. Five exercises a week; first two weeks.

### 7. Farmers' Exchanges.

*Professor Ferguson*

Consists of ten lectures on the possibilities, methods and benefits of farmers' exchanges for purchasing supplies, selling milk, eggs, poultry, fruit and other farm products; for building storages, for utilizing surplus and unmarketable products and for forming community breeding associations, boys' marketing clubs, and the like; how to form them and run them successfully. Five exercises a week; second two weeks.

## GROUP B

### HORTICULTURE, FORESTRY, LANDSCAPE GARDENING

### 8. Fruit Growing.

*Professor Sears*

A study of modern methods of propagating, planting, cultivating, pruning, fertilizing and spraying fruit trees; planning and managing orchards; selling fruit. Lectures, demonstrations and field exercises. Five exercises a week; four weeks.

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## "THE AMHERST MOVEMENT"

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### 9. Practical Gardening.

*Mr. Tompson*

This course consists almost wholly of practical field exercises in planting, training and cultivating vegetables, and while no special effort is made to put the work into common school form, the exer-

cises are especially valuable to school garden teachers. Limited to twenty pupils. Two lectures and three laboratory exercises a week; four weeks.



### 10. Amateur Floriculture. *Professor Nehrling*

Covers the growing of flowers in the home and school garden. The

course is designed to familiarize the student with the subjects of containers, potting and potting soils, fertilizers, insecticides, and the propagation and culture of plants suitable for the window garden. Lectures and demonstrations. Five exercises a week; first two weeks.

### 11. Garden Flowers.

*Professor Nehrling*

A rather detailed study of the several varieties, propagation and culture of bulbs, annuals, herbaceous perennials, and bedding plants. The work is supplemented with discussions on the planting of formal flower gardens and informal borders. Lectures, demonstrations, and field trips. Five exercises a week; second two weeks.

### 12. Dendrology.

*Professor Clark*

A number of short field trips are made to identify and study the habits of growth of our native and commonly introduced species of trees. Five exercises a week; first two weeks.

### 13. Silviculture.

*Professor Clark*

A rather general study of forests, forestry practices, and woodlot management. Field trips and lectures. A knowledge of trees is presupposed. Five exercises a week; second two weeks.

### 14. Garden Making.

*Professor Waugh*

Devoted chiefly to ornamental garden planning and the ways of making garden life popular and enjoyable, with such practical instruction as is necessary in the simpler forms of gardening. Five exercises a week; first two weeks.

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### 15. Civic Improvement.

*Mr. Elwood*



Instruction as to how best to organize and carry on civic betterment; the various technical problems involved, the principles on which they are to be solved, with special reference to rural conditions. Five exercises a week; second two weeks.

### GROUP C SCIENCES RELATED TO AGRICULTURE

No course in elementary chemistry is offered, and the two half-session courses in chemistry are strictly agricultural in character. While no definite prerequisite is necessary some knowledge of chemistry is desirable.

### 16. Inorganic Agricultural Chemistry.

*Professor Peters*

- (a) Fertilizers
- (b) Insecticides.
- (c) Soils.

Intended for teachers of science in agricultural high schools, and for those working with orchards or soils. The work is correlated with that in the courses on fruits and on soils. All the principal salts used in making fertilizers are handled, and superphosphate, ammonium sulfate and potassium sulfate are prepared from their natural sources. The following insecticides and fungicides are made by each student: lead arsenate, lime-sulfur, Bordeaux mixture, Paris green. Some work is done to show the retention by the soil of the important constituents of plant food. The lectures are, for the most part, informal talks grouped about the preparations in hand. Five two-hour exercises a week; first two weeks.

### 17. Organic Agricultural Chemistry, Plants and Animals.

*Professor Peters*

Intended primarily for teachers of agriculture and science in secondary schools. Supplementary to Course 16. Plants are studied as to their composition and their relation to

- (a) soil and climate as affecting their composition,
- (b) manufactured products, such as alcohol, vinegar, sugar, starch, cellulose, dynamite, etc.
- (c) animals as animal food.

Five two-hour exercises a week; second two weeks.

### 18. Plant Experiments and School Demonstration Material.

*Mr. McLaughlin*

A lecture course illustrated by simple experiments in plant life, with home-made apparatus and methods of preparing plant material

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## "THE AMHERST MOVEMENT"

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useful in schools, such as seeds and seedlings, common plant diseases, etc. A useful course for science teachers and others interested in plant life. Five exercises a week; first two weeks.

### 19. General Botany.

*Professor Osmun*

An outline of the anatomy, morphology, and physiology of higher plants. This course is especially suited to the needs of teachers of science and nature study and to amateur botanists. Previous training in the subject is not required. Five exercises a week; second two weeks.

### 20. Cryptogamic Botany.

*Professor Osmun*

As outlined, this is very largely a laboratory course, consisting of microscopic and field study of lower forms of plant life, including algæ, fungi, mosses and ferns. The major portion of the time may be devoted to some special group, such as the ferns, if desired by the class. Previous training in botany is required. Limited to twenty pupils. Three two-hour exercises; second two weeks.

### 21. Bird Life.

*Mr. Maynard*

A first-hand study of the local bird fauna, conducted largely in the field. Special attention is given to economic relations of the birds and to nesting habits. Five exercises a week; four weeks.

### 22. Insect Life.

*Professor Fernald*

An introductory course which has been arranged with particular reference to the needs of teachers in grade schools and high schools who are expected to treat of insects in their classes, either as a part of nature study or in their relation to agriculture. The course is also planned for persons, not teachers, who wish a general knowledge of insect pests and methods of control. A part of the time is spent in the field, studying living insects, their habits, the injuries they cause, and their identification. Five exercises a week; four weeks.

### 23. Methods of Collecting in Entomology.

*Professor Fernald*

In order to at least partially meet the increasing desire to obtain collections for use in schools, for nature study teaching, etc., this course is arranged to cover the subjects of collecting, preserving, mounting and preparing collections of the common insects. The work is largely in the field and the collections prepared may be kept by those making them. Besides making the collections, the work and habits of insects are studied. Materials furnished at cost. Four two hour periods a week; four weeks.

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*Entomology Building*

### **24. Beekeeping.**

*Professor Gates and Mr. Byard*

This course is designed particularly for school teachers or beginners in the subject. Comprises the elementary and practical features of the beekeeping industry, including equipment, handling and manipulation of bees, essential apparatus, a discussion of the diseases and races of the honey bee, the utilization of bees as nature study material in the lecture and schoolroom, as well as for pleasure. Five lectures and such laboratory periods as can be arranged each week; second two weeks.

## **GROUP D**

### **HOME ECONOMICS, PRACTICAL ARTS**

### **25. Foods and Household Administration.**

*Professor Comstock and Miss Hopkins*

A definite study outlining the several food principles governing normal and special diets; the planning of menus; cost of materials and preparation are discussed during the first two weeks. Lectures are given on house construction and remodeling, sanitation and decoration during the third week. General topics pertaining to household administration, labor saving appliances, budget making and account keeping are discussed during the fourth week. Demonstrations are given in the preparation and serving of milk, eggs, cheese, cereals, vegetables, fruits, meats, bread, baking powder mixtures, salads, desserts, pastry and invalid foods. Three lectures and two demonstrations a week; four weeks.

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### 26. Cookery.

*Miss Hopkins*

A study in fundamental principles of cookery and balanced ration, and a consideration of three meals a day from the dietetic, æsthetic and economic standpoints. The demonstrations in Course 25 are open to women taking this work. Three exercises a week; second two weeks.



*Beginning at the Right Age*

### 27. Practical Nursing.

*Professor Comstock*

This covers the subjects, personal hygiene, sick room and its appointments, bed making, bandaging, fumigation, contagious diseases and emergencies in their home connection. Two exercises a week; four weeks.

### 28. General Home Economics.

*Professor Comstock*

A rather general and comprehensive course planned to acquaint students with the history, work and literature of Home Economics and its value as a part of a girl's education. Three exercises a week; four weeks.



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### 29. Home Economics for Rural and Small Village Schools.

*Professor Comstock and Miss Hopkins*

Designed primarily to assist teachers in adapting home economics lessons to rural needs. Methods of presenting work form a large feature of the course. Three weeks given to the discussion of food and nutrition and one week to sanitation and handwork. A study is made of necessary equipment for cookery in small schools. Demonstrations are given in the preparation of cereals, milk, eggs, cheese, vegetables, fruit, bread, baking powder mixtures, meat and meat substitutes, salads, simple desserts, cake, canning of fruits and vegetables, school lunches, table setting and serving. Five lectures and three demonstrations a week; four weeks.

### 30. Correlation of Home Economics.

*Miss Nash*

Designed for rural teachers. Treats of the relationship between home economics and such subjects as schoolhouse decoration, school grounds, school gardens and the three R's. Work in the Home Economics Club will be considered. Five lectures beginning July 14.

### 31. Design and Practical Arts.

*Mr. Ried*

1—DESIGN—Lectures and laboratory work developing the value of design as a rural school asset. Those taking this work should bring 9" x 12" drawing paper, carbon paper, scissors, ruler, eraser, knife and pencils.

2—PRACTICAL ARTS—Lectures and laboratory work in binding and its various problems, basketry, elementary weaving, thin and thick cardboard construction, leather work, bagging projects and rural dyeing; also other phases of rural pre-vocational subject matter, also rural avocational craft-work.

Five exercises a week; four weeks.

## GROUP E

### ORGANIZED PLAY AND RECREATION

#### 32. Organized Play and Recreation.

*Mr. Ruetschi*

A study of rural recreation and a résumé of the place which organized play may take in community development. Methods of organizing and directing games, athletics, festivals and pageantry are taken up. Demonstrations form a feature of the work. Three lectures a week with extra afternoon demonstrations; four weeks.

#### 33. Plays and Pageantry.

*Miss Ida Hall*

A study in which dramatic principles are applied to schools, rural communities and city neighborhoods in such a way as to develop self-expression, good taste, morality and social good will. Simple pageants and short dramas give an opportunity for students to practice stage management and costuming. This course should be helpfully suggestive to teachers and social workers who are inex-

(Continued on page 18.)

# Summer School

	8.25—9.15	9.25—10.15
<b>Monday</b>	<ul style="list-style-type: none"> <li>1 Soil Fertility 4 weeks</li> <li>10 Amateur Floriculture 1st 2 weeks</li> <li>11 Garden Flowers 2nd 2 weeks</li> <li>16 Inorganic Chemistry 1st 2 weeks</li> <li>17 Organic Chemistry 2nd 2 weeks</li> <li>22 Insect Life 4 weeks</li> <li>28 General Home Economics 4 weeks</li> <li>29 Home Economics (Laboratory) 4 weeks</li> <li>32 Organized Play 4 weeks</li> <li>33 Plays and Pageants 2nd 2 weeks</li> <li>38 The New Rural Church 2nd 2 weeks</li> </ul>	<ul style="list-style-type: none"> <li>2 Breeds and Types 4 weeks</li> <li>8 Fruit Growing 4 weeks</li> <li>16 Inorganic Chemistry 1st 2 weeks</li> <li>17 Organic Chemistry 2nd 2 weeks</li> <li>18 Plant Experiments 1st 2 weeks</li> <li>19 General Botany 2nd 2 weeks</li> <li>29 Home Economics (Laboratory) 4 weeks</li> <li>34 Home and School Garden Supervision 4 weeks</li> <li>37 Small Fruit Growing 2nd 2 weeks</li> <li>31 Practical Arts and Design 4 weeks</li> </ul>
<b>Tuesday</b>	<ul style="list-style-type: none"> <li>1 Soil Fertility</li> <li>10 Amateur Floriculture</li> <li>11 Garden Flowers</li> <li>16 Inorganic Chemistry</li> <li>17 Organic Chemistry</li> <li>22 Insect Life</li> <li>27 Nursing 4 weeks</li> <li>32 Organized Play</li> <li>33 Plays and Pageants</li> <li>38 The New Rural Church</li> </ul>	<ul style="list-style-type: none"> <li>2 Breeds and Types</li> <li>8 Fruit Growing</li> <li>16 Inorganic Chemistry</li> <li>17 Organic Chemistry</li> <li>18 Plant Experiments</li> <li>19 General Botany</li> <li>31 Practical Arts and Design</li> <li>34 Home and School Garden Supervision</li> <li>37 Small Fruit Growing</li> </ul>
<b>Wednesday</b>	<ul style="list-style-type: none"> <li>1 Soil Fertility</li> <li>10 Amateur Floriculture</li> <li>11 Garden Flowers</li> <li>16 Inorganic Chemistry</li> <li>17 Organic Chemistry</li> <li>22 Insect Life</li> <li>28 General Home Economics</li> <li>29 Home Economics (Laboratory)</li> <li>32 Organized Play</li> <li>33 Plays and Pageants</li> <li>38 The New Rural Church</li> </ul>	<ul style="list-style-type: none"> <li>2 Breeds and Types</li> <li>8 Fruit Growing</li> <li>16 Inorganic Chemistry</li> <li>17 Organic Chemistry</li> <li>18 Plant Experiments</li> <li>19 General Botany</li> <li>29 Home Economics (Laboratory)</li> <li>31 Practical Arts and Design</li> <li>34 Home and School Garden Supervision</li> <li>37 Small Fruit Growing</li> </ul>
<b>Thursday</b>	<ul style="list-style-type: none"> <li>1 Soil Fertility</li> <li>10 Amateur Floriculture</li> <li>11 Garden Flowers</li> <li>16 Inorganic Chemistry</li> <li>17 Organic Chemistry</li> <li>22 Insect Life</li> <li>27 Nursing</li> <li>32 Organized Play</li> <li>33 Plays and Pageants</li> <li>38 The New Rural Church</li> </ul>	<ul style="list-style-type: none"> <li>2 Breeds and Types</li> <li>8 Fruit Growing</li> <li>16 Inorganic Chemistry</li> <li>17 Organic Chemistry</li> <li>18 Plant Experiments</li> <li>19 General Botany</li> <li>31 Practical Arts and Design</li> <li>34 Home and School Garden Supervision</li> <li>37 Small Fruit Growing</li> </ul>
<b>Friday</b>	<ul style="list-style-type: none"> <li>1 Soil Fertility</li> <li>10 Amateur Floriculture</li> <li>11 Garden Flowers</li> <li>16 Inorganic Chemistry</li> <li>17 Organic Chemistry</li> <li>22 Insect Life</li> <li>28 General Home Economics</li> <li>29 Home Economics (Laboratory)</li> <li>32 Organized Play</li> <li>33 Plays and Pageants</li> <li>38 The New Rural Church</li> </ul>	<ul style="list-style-type: none"> <li>2 Breeds and Types</li> <li>8 Fruit Growing</li> <li>16 Inorganic Chemistry</li> <li>17 Organic Chemistry</li> <li>18 Plant Experiments</li> <li>19 General Botany</li> <li>29 Home Economics (Laboratory)</li> <li>31 Practical Arts and Design</li> <li>34 Home and School Garden Supervision</li> <li>37 Small Fruit Growing</li> </ul>
<b>Saturday</b>	All day excursions	

# Schedule, 1915

10.25—11.15			11.25—12.15			Afternoon		
3	Modern Dairying	4 weeks	6	Farm Management and Accounts	1st 2 weeks	4	Dairying (Laboratory)	1.30—3.30 4 weeks
5	Poultry	4 weeks	7	Farmers' Exchanges	2nd 2 weeks			
9	Practical Gardening (Laboratory)	4 weeks	9	Practical Gardening (Laboratory)	4 weeks			
14	Garden Making	1st 2 weeks	12	Dendrology	1st 2 weeks			
15	Civic Improvement	2nd 2 weeks	13	Silviculture	2nd 2 weeks		Educational Trips	
20	Cryptogamic Botany	2nd 2 weeks	20	Cryptogamic Botany	2nd 2 weeks			
23	Methods of Collecting in Entomology	4 weeks	21	Bird Life	4 weeks			
25	Foods and Household Administration	4 weeks	23	Methods of Collecting in Entomology	4 weeks		Class Conferences	
26	Cookery	2nd 2 weeks	24	Beekeeping	2nd 2 weeks			
30	Correlation of Home Economics	3rd week	29	Home Economics	4 weeks			
34	Home and School Garden Supervision	4 weeks	39	Rural Community Planning	4th week			
35	Co-operation in Agriculture	3rd week	40	Rural Organization	3rd week			
36	Economic Aspects of N. E. Agric.	4th week						
3	Modern Dairying		6	Farm Management and Accounts		4	Dairying (Laboratory)	1.30—3.30
5	Poultry		7	Farmers' Exchanges				
9	Practical Gardening		12	Dendrology				
14	Garden Making		13	Silviculture				
15	Civic Improvement		21	Bird Life				
23	Methods of Collecting in Entomology		23	Methods of Collecting in Entomology			Organized Play and Recreation 3.30	
25	Foods and Household Administration (Lab.)		24	Beekeeping				
26	Cookery (Laboratory)		25	Foods and Household Administration (Lab.)				
30	Correlation of Home Economics		26	Cookery (Laboratory)				
34	Home and School Garden Supervision		29	Home Economics				
35	Co-operation in Agriculture		39	Rural Community Planning				
36	Economic Aspects of N. E. Agriculture		40	Rural Organization				
3	Modern Dairying		6	Farm Management and Accounts				
5	Poultry		7	Farmers' Exchanges				
9	Practical Gardening (Laboratory)		9	Practical Gardening (Laboratory)				
14	Garden Making		12	Dendrology				
15	Civic Improvement		13	Silviculture				
20	Cryptogamic Botany		20	Cryptogamic Botany				
23	Methods of Collecting in Entomology		21	Bird Life				
25	Foods and Household Administration		23	Methods of Collecting in Entomology				
26	Cookery		24	Beekeeping				
30	Correlation of Home Economics		29	Home Economics				
34	Home and School Garden Supervision		39	Rural Community Planning				
35	Co-operation in Agriculture		40	Rural Organization				
36	Economic Aspects of N. E. Agriculture							
3	Modern Dairying		6	Farm Management and Accounts				
5	Poultry		7	Farmers' Exchanges				
9	Practical Gardening		9	Practical Gardening (Laboratory)				
14	Garden Making		12	Dendrology				
15	Civic Improvement		13	Silviculture				
20	Cryptogamic Botany		20	Cryptogamic Botany				
23	Methods of Collecting in Entomology		21	Bird Life				
25	Foods and Household Administration (Lab.)		23	Methods of Collecting in Entomology				
26	Cookery (Laboratory)		24	Beekeeping				
30	Correlation of Home Economics		25	Foods and Household Administration (Lab.)				
34	Home and School Garden Supervision		26	Cookery (Laboratory)				
35	Co-operation in Agriculture		29	Home Economics				
36	Economic Aspects of N. E. Agriculture		39	Rural Community Planning				
			40	Rural Organization				
3	Modern Dairying		6	Farm Management and Accounts				
5	Poultry (Laboratory)		7	Farmers' Exchanges				
9	Practical Gardening (Laboratory)		9	Practical Gardening (Laboratory)				
14	Garden Making		12	Dendrology				
15	Civic Improvement		13	Silviculture				
20	Cryptogamic Botany		20	Cryptogamic Botany				
25	Foods and Household Administration		21	Bird Life				
26	Cookery		24	Beekeeping				
30	Correlation of Home Economics		29	Home Economics				
34	Home and School Garden Supervision		39	Rural Community Planning				
35	Co-operation in Agriculture		40	Rural Organization				
36	Economic Aspects of N. E. Agriculture							

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*Flint Laboratory*

perienced in the use of the stage and the platform and to mothers of young children. Ten lectures July 14—27, supplemented by plays and pageants given at the social evenings during the term.

### **34. Home and School Garden Supervision.** *Professor Morton*

A course based upon actual experience and planned for teachers and others who are looking forward to positions as supervisors of boys' and girls' home and school garden work. The following points are emphasized: (1) selecting, preparing, planting and caring for the backyard garden; (2) conducting work with groups of children in community and school gardens; (3) organizing clubs for home work, sources and uses of literature, and methods of establishing co-operative relations between the home and school; (4) and practical work in the theory and practice of canning greens, fruits and vegetables by the "cold pack method." It is recommended that course 1, Soil Fertility, or course 29, Home Economics for Rural Schools, be taken with this course. Supervisors of experience will present their methods of organizing and supervising these lines of work. Among those who will assist are Misses Burke of Brockton, Turner of Milton, Fay of Waltham, Hill of Groton, Messrs. Burke of Hadley, Hamlin of Everett, Professor Ingalls, state leader of Vermont, Professors Farrell and Benson of the U. S. Department of Agriculture, Mr. Wilfrid Wheeler of the State Board of Agriculture, and Dr. Rufus W. Stimson of the State Board of Education. Five two-hour exercises a week; four weeks.

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### GENERAL PLAN OF THE SUMMER SCHOOL WORK

The formal instruction in the Summer School is given in definite courses herein described. From these each pupil may elect courses of not less than ten nor more than fifteen exercises a week, unless a larger or smaller amount of work is especially allowed by the Supervisor. These courses include a large amount of field work, observation trips, outdoor exercises and laboratory experiments.

Besides these, general field exercises are arranged for one afternoon of each week. These are on topics of interest to all. Excursions are arranged for every Wednesday afternoon, and more extended excursions for the whole school are planned for every Saturday. All excursions are in charge of an instructor.

Round table and special discussions are arranged by various instructors as their courses require.

A course of evening lectures on popular topics relating to the work of the school forms a feature of the general program. Like everything else connected with the Summer School, this lecture course is entirely free to all students.

### COLLEGE EQUIPMENT

The Massachusetts Agricultural College is maintained by the Federal government and by the State of Massachusetts for teaching and investigation in agriculture in the broadest sense. The College has over 500 acres of land most of which is in a high state of cultivation and illustrates most of the leading agricultural industries of Massachusetts and some of the best agricultural specialties. There is a large range of greenhouses of the most modern and approved type; there is a modern dairy barn with dairy cattle; there are good

horses, pure-bred swine, sheep and poultry; there are fields of corn, potatoes, clover and grass in season; orchards of apple, peach, plum and pear trees; tracts of good forest land, nurseries, market gardens; in addition, a good school garden, maintained co-operatively by the College and the Amherst schools, will be in operation.



*One of the College Orchards*

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There are also considerable tracts devoted to experiments, many of which are of unusual interest. Then there are well-equipped departments of botany, entomology and chemistry, dealing in the most thorough manner with these special sciences. All of this equipment (much more than can be described or even named) is placed at the service of the Summer Schools.

### THE LIBRARY

The college library occupies the entire lower floor of the Chapel building and contains nearly 45,000 volumes in addition to a large number of pamphlets. The equipment is such that the library ranks extremely well with the agricultural libraries of the country. Summer School students are able to find splendid material in every line of college work, especially in agriculture, horticulture, botany, entomology, and sociology. The reading room is provided with a variety of magazines, encyclopedias, and reference books, in addition to the newspapers and agricultural weeklies.

The library hours are from eight a. m. to twelve m. and from one to five p. m. every week day, and from nine a. m. to two p. m. on Sundays. The librarian and his assistants are constantly on hand, ready and willing to be of assistance to the Summer School students.

### ELECTION OF COURSES

Election of courses should be made at the time of registration. Every election is subject to the approval of the Supervisor and of the instructor whose course is elected. As it is necessary to schedule several courses against each other, certain combinations of courses are made unavailable. It should be specially noticed that certain courses are offered to a limited number of pupils only, and as a rule pupils are accepted in these courses in the order of application. Each pupil should choose such combinations of courses as will keep two or three subjects in hand at the same time. This will meet the requirement that each one must take at least ten and not more than fifteen exercises a week, unless permitted to take more or less by special order of the Supervisor. See Schedule of Courses and hours at which they come on pages 16 and 17.



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### GROUPING OF COURSES

Those desiring work in general agriculture and animal husbandry should elect from courses Nos. 1, 2, 3, 4, 5, 6, 7.

Those desiring work in horticulture and forestry should elect from courses, Nos. 1, 6, 7, 8, 9, 10, 11, 12, 13, 14, 24, 37.

Those wishing to make desirable combinations of the home economics courses should elect from Nos. 25, 26, 27, 28, 29, 30, 31.

Those desiring to train themselves for supervising playgrounds and gardens from Nos. 1, 9, 10, 11, 14, 15, 21, 22, 29, 30, 31, 32, 33, 34, 37.

Those interested in high school science should elect from Nos. 1, 16, 17, 18, 19, 20, 23, 34.

Those interested in rural sociology, agricultural economics and leadership in country life should elect from Nos. 29, 30, 32, 33, 35, 36, 38, 39, 40.

### REGISTRATION, ATTENDANCE, ETC.

Those who expect to attend should register as early as possible. **Registration fee for the Summer School of Agriculture and Country Life is \$5, payable at the time application is made.** No tuition fee is charged. Remittance should accompany application blank and should be made payable to the College Treasurer. A Summer School registration blank will be found in the back part of this bulletin. Registration fees will be refunded to those who find it impossible to attend the school.

Attendance is required in the courses elected. Some sort of examination, test or permanent note book will be required in each course. Those who complete at least three courses in a satisfactory manner, including practically perfect attendance, will be given certificates at the close of the term.

There are no rules or regulations. This absence of rules has worked admirably in the past, and it gives everyone a sense of freedom based on personal responsibility, the basis of all proper government, whether in school, college or the community.

**Tuition is absolutely free**, and there are no incidental charges. The College is supported by the State and the Federal governments, and receives no payments whatever from Summer School pupils except for room, board, and the registration fee.

### ROOMS AND BOARD

Rooms will be provided in the College dormitories and in private homes adjoining the College grounds. In general, the dormitory rooms are in suites of two bedrooms, opening into one study room, the bedrooms furnished with single beds. These rooms are located in two dormitories known as North College and South College and are reserved for women students exclusively. The toilet and bathrooms are in the basements; water is not provided in the rooms.

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While the appointments in general are not those of a high-priced summer hotel, they are sanitary and comfortable, and have been found pleasant to men students for many years and by the women students of the Summer School during the summer. A uniform rate of \$1.25 a week for each person will be charged for these rooms, and each pupil will be expected to supply her own blankets, sheets, pillow cases, towels, etc. Convenient arrangements for laundry work may be made in Amherst.

All requests for dormitory rooms must be made to, and rooms will be assigned by, the College Treasurer. A deposit of \$2.00 is required in order to have a room in a dormitory reserved. This deposit is not refunded to those who find it impossible to attend.

The College will also supply a limited number of first-class United States army wall tents for those who wish them. Each tent will accommodate two persons. The tents will be placed in a pleasant and convenient location on the College campus, and every reasonable provision will be made for the comfort of the occupants. This form of domicile has been found very acceptable in other summer schools, chautauquas and camps. Those who care for real outdoor life at its best will find these arrangements genuinely enjoyable. The charge for these tents will be \$1.00 a week for each person.

Rooms outside the College vary considerably in their accommodations and somewhat in price, the charge ranging from \$1.50 to \$2.50 a week for each person. A list of available rooms in the village will be furnished Summer School students at the time of registration. Every effort will be made by those in charge to see that everyone has comfortable accommodations.



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## "THE AMHERST MOVEMENT"

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The Phi Sigma Kappa Fraternity has built, during the year, a new house just at the entrance to the College grounds. Arrangements have been made to utilize this for women students during the Summer School. Accommodations for seventeen. Rates \$1.75 a week per person, bedding, towels, etc., to be furnished by Summer School students.

A few furnished houses are usually available in Amherst during July and August at reasonable rentals.

Good meals are served in Draper Hall, on the College grounds. Meals will be served on an à la carte basis at very low cost and should not amount to more than \$4.00 or \$4.50 a week. Good boarding places can be secured outside the College if desired.

### ATHLETICS AND RECREATION

Athletics and sports of various kinds occupy a prominent place in the Summer School. Tennis tournaments for both men and women are held and baseball teams are organized. Contests with teams from nearby towns are held, subject to the approval of the proper committee. This year, under competent supervision, demonstrations of organized play, recreation, folk dancing, and so forth will be given. Late afternoon and early evening periods will be used for this purpose.

The region around Amherst is especially rich in attractive places for tramping, excursions and picnics. The management of the Summer School usually arranges a suitable amount of this form of recreation.

### EVENING LECTURES AND SOCIAL LIFE

The management of the Summer School provides at least one evening lecture each week. These lectures are usually given by men of national repute and deal with practical, social and economic subjects related to rural life.

One or two social evenings are arranged for each week. These social evenings are under the direction of a committee of the faculty, working with the Summer School students. These events together with evening lectures, the regularly scheduled Wednesday and Saturday excursions, the afternoon field trips for study, make life at the Summer School extremely enjoyable as well as profitable.

(For Summer School application blank see last page of bulletin.)

(For Schedule see pages 16 and 17.)

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## "THE AMHERST MOVEMENT"

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### SCHOOL FOR RURAL SOCIAL SERVICE

JULY 13—JULY 27, INCLUSIVE

This year special emphasis will be laid upon the group of courses given especially for those who might be classed as rural social workers. These courses are intended for clergymen, teachers, librarians, town officers, grange workers and others who devote a considerable portion of their time to problems of community development.

From all these courses a group of studies may be easily arranged which will present the rural problem from several standpoints, and will serve to show the relationships of the workers in the different lines to their respective fields and to the larger community problems which are constantly being presented to them.

#### COURSES IN THE SCHOOL FOR RURAL SOCIAL SERVICE

**34. Home and School Garden Supervision** *Professor Morton*

This is a four-weeks course. The last two weeks, however, will be especially adapted to the needs of those who register in the School for Rural Social Service. For full description see page 18.

**35. Co-operation in Agriculture.** *Professor Ferguson*

The principles and practice, methods and benefits of organized agriculture. Co-operative buying and selling, co-operative production and co-operative rural credit will be considered. A thoroughly practical discussion based on studies in Europe and the United States. Five lectures, beginning July 14.

**36. Economic Aspects of New England Agriculture.** *Professor Ferguson*

A study of the characteristics of agriculture as an industry, the New England market for farm products, better methods of disposing of produce, the farmers' market, the problem of transportation and the supply of farm labor. Five lectures, beginning July 21.

**37. Small Fruit Growing.** *Professor Chenoweth*

A very direct and practical discussion of the best methods of growing, harvesting and marketing strawberries, raspberries, blackberries, currants and gooseberries. Ten lectures, beginning July 14.

**38. The New Rural Church.\*** *Professor Rowe and Dr. English*

A course which is especially adapted to actual conditions and problems in New England. Based on thorough study, combined with practical experience. Ten lectures, beginning July 14.

**39. Rural Community Planning.** *Professor Morgan*

This course is planned to cover a study of the principles and methods involved in practical community building; The Community Planning Idea; The Community Survey; The Community Council; The Community Program—what it is, how to get it, how to get results with it. Five lectures, beginning July 21.

\* This course is being maintained by the Massachusetts Federation of Churches.

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## "THE AMHERST MOVEMENT"

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### 40. Rural Organization.

*President Butterfield*

This course includes an analysis of the rural problem; organization as a principle of rural progress; the organization of public and voluntary agencies of rural improvement; regional organization,—local, county, state, national, world. Five lectures, beginning July 14.

The courses suggested for ministers, grange workers, community engineers, librarians, teachers and others are as follows.

8.25—9.15 The New Rural Church or Garden Flowers.

9.25—10.15 Small Fruit Growing.

10.25—11.15 Choice of:

Civic Improvement; Co-operation in Agriculture; Economic Aspects of New England Agriculture; Cookery; Correlation of Home Economics.

11.25—12.15 Rural Organization and Rural Community Planning.

Other courses beginning July 14 are:

Course 7, Farmers' Exchanges; Course 13, Silviculture; Course 17, Organic Chemistry; Course 19, General Botany; Course 20, Cryptogamic Botany; Course 33, Plays and Pageantry.

### CONFERENCES AND DEMONSTRATIONS

Besides the demonstrations of organized play on Tuesday and Thursday afternoons, there will be arranged, on other afternoons and evenings, conferences and demonstrations on various subjects such as:

Community Organization; Boys' and Girls' Club Work; Town Administration; Community Engineering; School Administration; Special Town Celebrations; The Town Fair; Civic Improvement; Rural Church Problems and Methods.

### SCHOOL FOR LIBRARY WORKERS

JULY 19-24, INCLUSIVE

During the week beginning July 19 a special course, designed to meet the needs of the rural community librarian, will be offered. The periods in the forenoon will be devoted to lectures and laboratory work, dealing with the cataloguing and classifying of books, other agricultural literature and public documents for rural libraries. The afternoon periods will be given over to lectures by specialists from the college and elsewhere, on the various phases of the relationship of the library to the community.

A circular describing this school more in detail and outlining the courses can be secured upon application to the Supervisor of Short Courses or to Chas. R. Green, Librarian, M. A. C., Amherst Mass.

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## "THE AMHERST MOVEMENT"

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### THE BOYS' CAMPS

JULY 6-30, 1915

#### ANNOUNCEMENT

During the month of July, 1915, the Massachusetts Agricultural College will conduct three agricultural camps for boys in connection with the regular Summer School of Agriculture and Country Life. Each camp will be of one week's duration. The college feels it has a direct duty



to the boys of the state whose inclinations draw them toward agricultural pursuits. In addition to instruction along agricultural lines there will be a well balanced program of instruction in some of the vital problems of life, and periods will be devoted to athletics and other forms of recreation as shown in the tentative outline of a day's activities. The main purpose of these camps is fourfold:

1. To interest the boy in agriculture and country life. This is the primary object.
2. To impress on the boy his responsibilities as a member of society.
3. To teach the boy clean, wholesome sports, recreation, and proper spirit in competitive contests.
4. To demonstrate the value of a Boys' Camp as an educational factor.

#### DATES OF THE CAMPS

**First Camp.**—July 6—July 14.

Registration closes July 1.

**Second Camp.**—July 14—July 22.

Registration closes July 8.

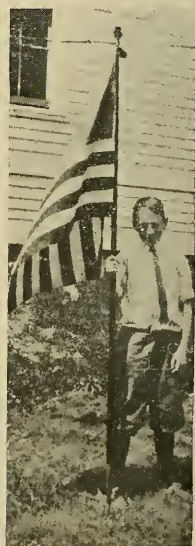
**Third Camp.**—July 22—July 30.

Registration closes July 14.

NOTE.—Those boys who were in the 1913 or 1914 Camps may register for the second camp only.

Only agricultural club prize winners will be admitted to the third camp.

A special camp for the girl winners in club work will also be held July 22-30.



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## "THE AMHERST MOVEMENT"

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*Off for a "Hike"*

### ORGANIZATION OF THE CAMP

#### Selection of Boys

The selection of boys who are to receive the advantages of these camps will be left to the individuals in various organizations which may be interested. Granges,

Y. M. C. A.'s, Churches, Clergymen, Scout Masters, Superintendents and Teachers are urged to select boys who might be benefited by a week of this kind, and to see that they are provided with necessary means in order to attend.

Each camp will be limited to fifty boys.

Boys between the ages of 12 and 17 years only will be admitted.

#### Discipline

The camps will be under military discipline. Only those boys who are willing to conduct themselves in the proper manner and observe the rights and comforts of others are invited to join the camp. All members of the camp are required to attend and participate in all meetings on the schedule unless prevented by illness. There are only a few definite rules in connection with the camps.

1. There shall be no firearms in camp.
2. There shall be no smoking.
3. No camper is allowed to leave the college campus without permission.
4. A gentleman always.

#### Expenses

Eight dollars will be charged each boy for the week. This registration fee is used primarily for board, to help defray the cost of maintaining the camp and of instruction and supervision.

#### LOCATION OF THE CAMP

The camp is situated on the M. A. C. College campus just south of the College Armory. The boys sleep in a large tent 40 by 70 feet, made of army duck. Each boy is provided with a spring wire cot. These cots are grouped into units of six, designated as "tents" and a leader is selected for each.

A smaller tent is used for the commandant's office. The medical outfit of the physical director's office is readily accessible.

Meals are obtained at the College Dining Hall.

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## "THE AMHERST MOVEMENT"

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### TENTATIVE PROGRAM OF A DAY AT "BOYS' CAMPS"

- 6.00 A.M. "Reveille"—Setting up exercises, shower baths, dress.  
7.00 A.M. Flag Raising.  
7.15 A.M. Breakfast—Chapel exercises at table, announcements for the day.  
8.00 A.M. Camp Duties—"picking up."  
8.20 A.M. Agricultural Lesson.  
10.00 A.M. "Prepare for Inspection"—Make beds.  
10.20 A.M. Morning Talk.  
12.00 A.M. Tent Inspection.  
12.30 P.M. Dinner.



"Whittling"



"The Bunch"



"Champs"

- 1.00 P.M. "Quiet Hour"—Rest in tent, read, write letters home, study in library.  
2.00 P.M. Games and Recreation—Tennis, baseball, track, swims.  
4.30 P.M. Afternoon Specialties—Basketry, surveying, photography, stock judging, etc.  
6.00 P.M. Supper.  
6.45 P.M. "Colors."  
7.00 P.M. Evening Specialty—Games, wig-wagging, "Weatherman," rope-tying, etc.  
7.30 P.M. Evening Lecture or Open Night—Campfire, roasts, vaudevilles, etc.  
9.15 P.M. "Tattoo"—Everybody in tents.—"Camp Newspaper."  
9.30 P.M. "Taps"—Lights out.

## POULTRY CONVENTION

JULY 21—23, 1915

Previous to 1913, a special course in Poultry Husbandry of one or two weeks' duration was offered during the month of March, each year, to those who could not take advantage of either the regular or short courses at the College, but on account of the incubation season coming at that time many were kept away.

Two years ago it was decided to hold a summer field meet, or summer convention, the last of July, and the results showed conclusively that this is a convenient time for poultrymen to get away for a few days. More than seven hundred were in attendance last year, probably the largest gathering of poultry men and poultry women ever held in the United States.



This convention has now become an established annual event at the College. Indications point to a larger and better convention than ever this year.

We hope to improve on our last year's program by adding special features. The wishes and needs of the poultry men and women of the State will be the first and only consideration. Speakers from outside the State will be men of national reputation. The principal features of this year's program are as follows:

1. Lectures by the best talent that can be secured.
2. Demonstrations in killing, picking, packing and preparation for retail trade.
3. Demonstrations in grading and judging market eggs.
4. Demonstrations in selection and mating both for utility and exhibition purposes.
5. Demonstrations with poultry equipment.
6. Poultry museum. Samples of feeds, equipment, diseased specimens, charts, etc.

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## "THE AMHERST MOVEMENT"

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7. A small poultry farm in Massachusetts. This will be made one of the special features of the program. It will not only be handled on the platform with charts, diagrams, maps, etc., but a farm will be plotted in miniature at the college plant.

Program ready June 1st. This may be had by writing

SUPERVISOR WILLIAM D. HURD OR  
PROFESSOR JOHN C. GRAHAM,  
Amherst, Mass.

## THE CONFERENCE ON RURAL ORGANIZATION

JULY 27—JULY 31, INCLUSIVE

The Conference on Rural Organization which has been held for the past five years as a closing feature of the Summer School will take place as usual under the auspices of the following organizations:

The Massachusetts Agricultural College  
The Massachusetts Federation of Churches  
The Massachusetts State Board of Education  
The Massachusetts Civic League  
The Free Public Library Commission  
The State Board of Health  
The New England Home Economics Association  
The Massachusetts State Grange  
The Massachusetts Federation of Women's Clubs

Definite class instruction is given each morning. The afternoons are given up entirely to special and general conferences on what seem to be the most important subjects in our rural life, demonstrations of organized play, recreation, etc. The evenings are given over to music and lectures by eminent students of rural sociology, economics and education.

**Organization** will be the keynote of the Conference.

The first day will be devoted to Actual Achievements in Massachusetts Towns; the second day to Town Policies; the third day to County Policies, and the fourth day to State Policies.

The Rural Social Service exhibits will be more elaborate and extensive than in 1914.

The object of this conference is to acquaint those who are leaders in their respective communities with the work that is going on, not only in Massachusetts, but in New England and other parts of the world, and to give them renewed inspiration and enthusiasm for larger and more intelligent efforts.

Teachers, clergymen, grange officers, librarians, county Y.M.C.A. workers, town officers, boards of health, officers of village improve-



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## "THE AMHERST MOVEMENT"

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ment societies, homemakers, school officers and all others interested in community development, are cordially invited to attend this Conference. The expenses for board and room are low.

A complete program will be published June 1st and can be had by making application to E. L. MORGAN, In Charge of Conference, M. A. C., Amherst, Mass.

### THE REGION SURROUNDING AMHERST

Amherst is one of the most delightful towns in New England, and has long been noted for the natural scenic beauties surrounding it, and as an educational center. It is located in the heart of the Connecticut valley. The Holyoke range, Mt. Tom, Mt. Holyoke, Mt. Toby, the Orient, the Connecticut River, Rattlesnake Gutter, Whately Glen, Old Deerfield and other places of great scenic beauty and historic interest are within easy walking, trolley or driving distance. The Berkshire and Hampshire Hills country is easily accessible.

The climate is good and usually not excessively warm during July.

The surroundings of the Summer Schools, the organization and methods of work, are such as to make a stay of two to four weeks enjoyable in every way. It furnishes the pleasantest sort of outdoor life, with just enough of work and recreation, under the simplest possible organization. From the first, special attention has been given to the outdoor exercises and recreation features of the program, and these will be still further emphasized in 1915.

### LOCATION OF AND DIRECTIONS FOR REACHING AMHERST

Amherst is ninety-eight miles west of Boston and twenty-five miles from Springfield. It can be reached from Boston over the Boston and Maine Railroad (Southern Division from North Station) or by the Boston and Albany Railroad from South Terminal Station via Palmer, thence to Amherst over the Central Vermont Railroad.

It may also be reached from Springfield or Greenfield by the Boston and Maine Railroad via Northampton, or by trolley from Springfield via Holyoke or Northampton.

From New York, take New York, New Haven and Hartford Railroad to Springfield, then to Amherst by train or trolley as already stated.

Persons coming from Albany, Buffalo and the West would best come to Springfield and then to Amherst as stated above.

For further information concerning the Summer Schools, write

WILLIAM D. HURD, Supervisor of Short Courses.

Massachusetts Agricultural College, Amherst, Mass.

MASSACHUSETTS AGRICULTURAL COLLEGE

Summer School of Agriculture—1915

Application for Registration.

Name, (Mr., Mrs. or Miss).....
Post Office.....Street Address.....
State.....Present Occupation.....
Schools previously attended.....
Reference.....

Name of person to whom word may be sent in case of illness or accident.....

Address of above person.....

Consult the schedule and place an X before each course you wish to take.

- COURSE
1 Soil Fertility
2 Breeds and Types of Live Stock
3 Modern Dairying
4 Dairy Laboratory
5 Poultry Breeding and Management
6 Farm Management and Farm Accounts
7 Farmers' Exchanges
8 Fruit Growing
9 Practical Gardening
10 Amateur Floriculture
11 Garden Flowers
12 Dendrology
13 Silviculture
14 Garden Making
15 Civic Improvement
16 Inorganic Agricultural Chemistry
17 Organic Agricultural Chemistry
18 Plant Experiments and School Demonstration Material
19 General Botany
20 Cryptogamic Botany
21 Bird Life

- COURSE
22 Insect Life
23 Methods of Collecting in Entomology
24 Beekeeping
25 Foods and Household Administration
26 Cookery
27 Practical Nursing
28 General Home Economics
29 Home Economics for Rural and Small Village Schools
30 Correlation of Home Economics
31 Design and Practical Arts
32 Organized Play and Recreation
33 Plays and Pageants
34 Home and School Garden Supervision
35 Co-operation in Agriculture
36 Economic Aspects of New England Agriculture
37 Small Fruit Growing
38 The New Rural Church
39 Rural Community Planning
40 Rural Organization

Send this blank to the Supervisor.

I wish to take.....weeks' work, beginning.....

Room preference (read bulletin carefully).....

Accepted.....

Supervisor.

Date received.....Fees.....Ref.....





**THE M. A. C. BULLETIN**  
**AMHERST, MASS.**

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VOLUME VII

SEPTEMBER, 1915

NUMBER 5

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**GRADUATE SCHOOL OF AGRICULTURE**

UNDER THE AUSPICES OF THE

**Association of American Agricultural Colleges  
and Experiment Stations**

**SEVENTH SESSION**

TO BE HELD AT THE

**Massachusetts Agricultural College**

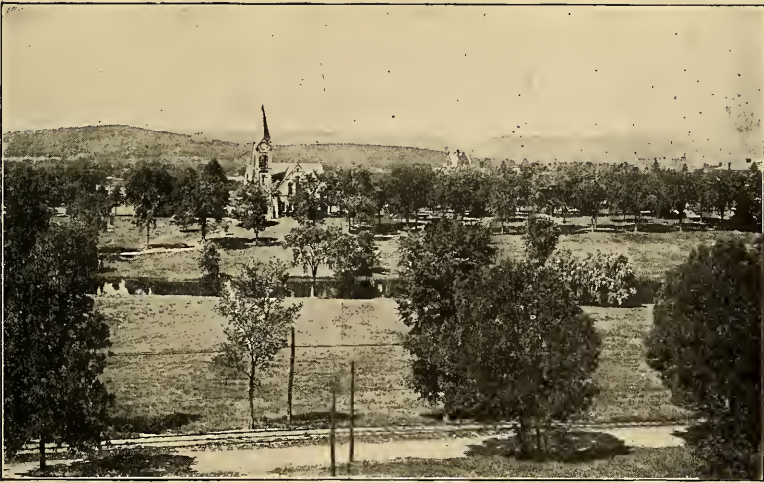
**JULY 3-28, 1916**

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Published six times a year by the Massachusetts Agricultural College  
January, February, March, May, September and October  
Entered as second-class matter at the Postoffice, Amherst, Mass.





VIEW OF THE WEST CAMPUS

## THE GRADUATE SCHOOL OF AGRICULTURE.

### PURPOSES

The Graduate School of Agriculture had its origin in a growing demand from instructors in agricultural colleges and workers in agricultural experiment stations. They felt the need of reviewing and studying the more recent developments in natural, social and economic sciences, applied to agriculture, as well as in the technical branches of the so-called practical agriculture, under the guidance and with the assistance of those able to deal efficiently with such problems; they have also desired to give students such an outlook toward agricultural problems as would lead them to undertake regular graduate study as opportunity might be offered.

At the time the school was inaugurated, there was little chance for advanced study at any of the institutions prepared to cope with these problems and possessed of the sympathetic touch with agricultural practices. Conditions have changed materially since the first session held at the Ohio State University in 1902. Systematic graduate courses are now offered in several of our leading institutions and excellent results are being attained. The need for advanced systematic courses in agricultural science, sociology, economics and practices is therefore largely provided for. What remains to be accomplished is something which no institution can fully furnish, namely a short, many-sided, con-

ferential attack upon fundamental and special problems of agriculture by the leading specialists and minds of America, assisted by foreign specialists and minds. The purpose, therefore, resolves itself into the gathering of institutional clans and all others deeply interested and prepared to help themselves and to convey to the rising students the benefits of their wisdom. By a session of this nature the primary object, to contribute to agriculture, should be gained.

To make the Graduate School of Agriculture valuable in every particular, all interested in the promotion of agriculture should lend their support. There are, besides instructors in agricultural colleges and workers in agricultural experiment stations, many others who may gain by attendance. Since the promulgation of this idea fifteen years ago, many have been added to the corps of actively engaged agricultural agents, as the extension or field men, and practitioners who through their four years of college training are in a position to glean new ideas, new interpretations, and new inspiration. A generous treatment of big, vital questions must necessarily quicken the mental mechanism of any agricultural worker, expand his vision, enlarge his sympathies and rejuvenate chronic habits of thought.

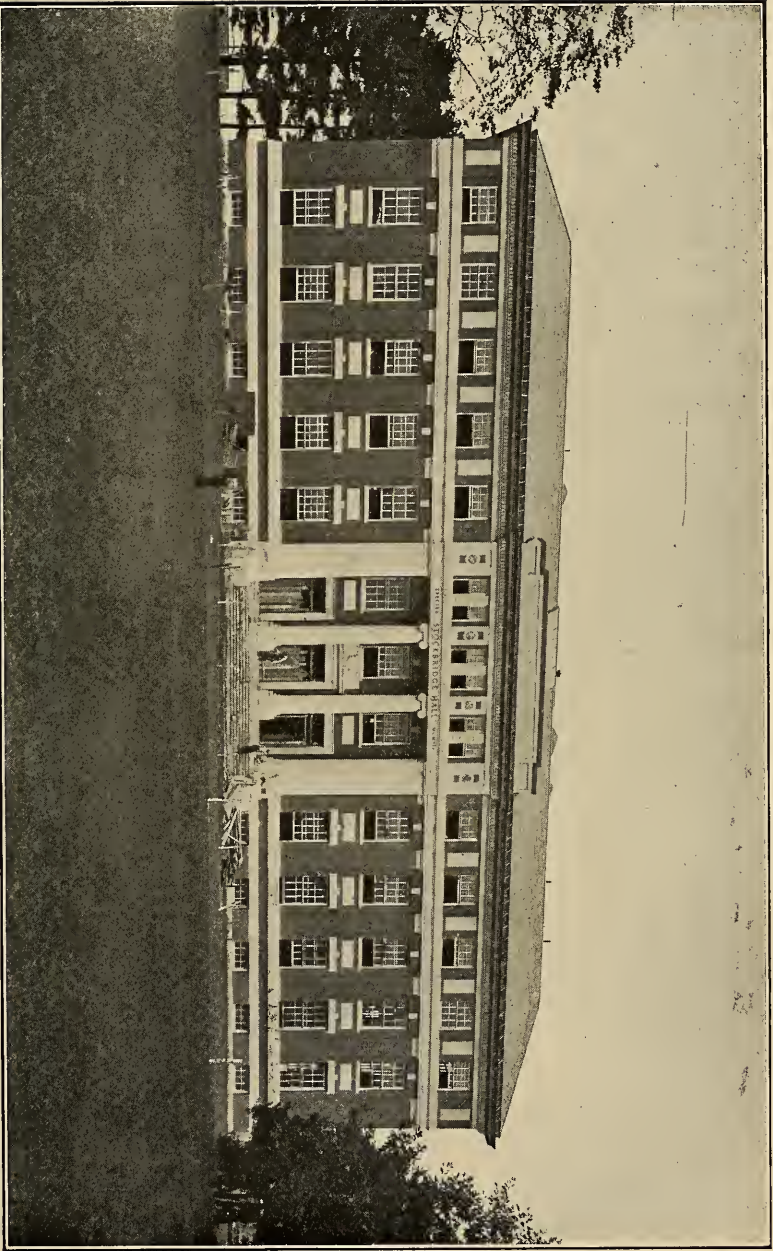
Agriculture can be made a wide-awake, active force, leading in domains of learning, instruction, investigations and vocations rather than a passive agency which yields submissively to the unorganized, illogical, chaotic and transient whims of society at large.

## REVIEW

This School is conducted under the auspices of the Association of American Agricultural Colleges and Experiment Stations through its committee on graduate study, and the Massachusetts Agricultural College. It has the approval of the Honorable Secretary of Agriculture, and has for its dean Dr. A. C. True, Director of the States Relations Service of the United States Department of Agriculture.

The first session was held at the Ohio State University July 7 to August 1, 1902; the second at the University of Illinois July 2 to July 28, 1906; the third at Cornell University July 6 to July 31, 1908; the fourth at Iowa State College July 4 to July 29, 1910; the fifth at Michigan Agricultural College July 1 to July 26, 1912; the sixth at the University of Missouri June 29 to July 24, 1914. The seventh session will be held at the Massachusetts Agricultural College July 3 to July 28, 1916.





STOCKBRIDGE HALL—HEADQUARTERS OF THE GRADUATE SCHOOL OF AGRICULTURE

Many prominent and learned men have been members of the faculties of the Graduate School. From abroad, Zuntz, Hall, von Tscharmak, Ewart, Russell, Marshall, and Darbishire have added zest, interest and valuable material to the sessions. From institutions which are not primarily agricultural in purpose, are found the names of Mendel, McDougal, Castle, Duggar, Riddle, Sherman, Carver, East and Harris, who have given a richness by their pertinency and depth of treatment. From institutions which have agriculture as their sole aim or as an important part of the general scheme of study, nearly all of the leading men well known for some time have participated. This array of men illustrates the seriousness and value of the School to those who possess the craving for progress or growth and a humble attitude for the acquiring of wisdom. The session to be held at the Massachusetts Agricultural College will earnestly endeavor to maintain the high standards of the past, with an increase of interest if possible.

## **COURSES**

Courses of instruction will be arranged under three general heads: (1) Factors of growth of plants and animals; (2) Agricultural Economics and Rural Sociology; and (3) Fundamental problems of intensive agriculture, including agronomy, horticulture and dairy husbandry. Each of these courses will consist of 20 lectures and about 20 seminars. At the seminars, which will be carefully organized with reference to purposes of graduate instruction, the subjects treated in the lectures will be further developed by additional experts and submitted to members of the School for discussion.

Special arrangements will be made by which groups of students may undertake laboratory work or other studies of subjects for which the Massachusetts Agricultural College has special equipment in experts and facilities in its several departments of instruction or research.

Through excursions and otherwise, typical features of the agricultural development and rural community life of the region in which the College is located will be utilized in connection with the courses of instruction of this Graduate School.

The faculty will include leading scientists and experts from the U. S. Department of Agriculture, the agricultural colleges and experiment stations, and other universities, colleges and scientific institutions in America and Europe.

## SETTING

There is much in the location of a Graduate School which has a session during one of the hottest months of the summer, and which has high ideals to maintain. The Massachusetts Agricultural College, which incorporates the Graduate School of Agriculture for the summer of 1916, possesses many of the qualifications desirable for graduate study.

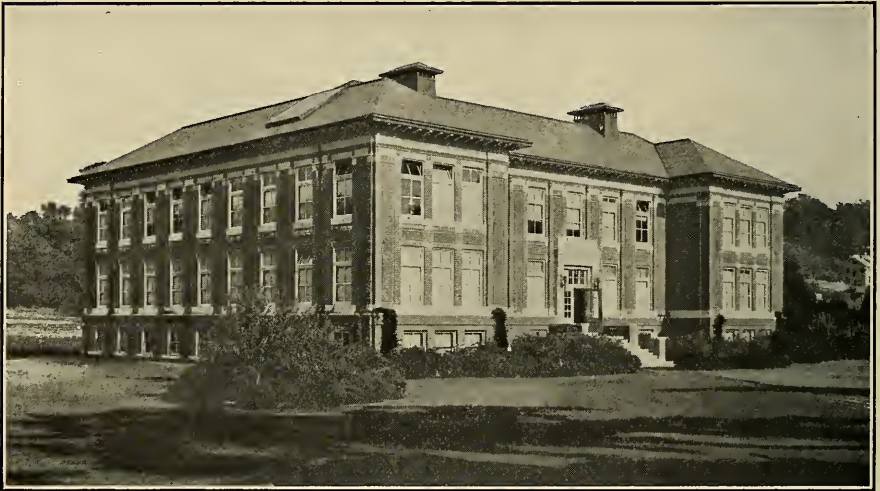
1. **Spirit.** The spirit and the purpose which make for sound graduate study are present. Since graduate study was first introduced at the Massachusetts Agricultural College early in the 90's, there has been developing not only an atmosphere that is singularly promotive of higher investigations and study in agriculture, but also a wholesome attitude and sympathy for agricultural pursuits from the practices to the most detailed scientific studies. This has culminated formally in the establishment of a regular Graduate School which will provide an excellent basis for the conduct of a summer session of the Graduate School of Agriculture held under the auspices of the Association of American Agricultural Colleges and Experiment Stations.

2. **Amherst.** Amherst, where the Massachusetts Agricultural College is located, is also the seat of the well-known Amherst College, which stands high in scholarship and exerts an influence of an exalted, generous and wholesome educational tone. At Northampton, eight miles away, is Smith College, which is known as a leading young ladies' college, and is so resourceful. Mary Lyon founded Mt. Holyoke College, ten miles south of Amherst, in South Hadley. This was the first woman's college; to this day the college maintains the spirit and character of the founder. At no great distance are many of the well known colleges and universities, Harvard, Yale, Columbia, Clark, Massachusetts Institute of Technology, Radcliffe, Tufts, Dartmouth, Williams, and many others. It is not very far away from the situation of the first district schoolhouse. In brief, Amherst is in a region where education and educational institutions in America have had their home and origin.

The town or village of Amherst is within twenty-five miles of Springfield, which is situated on the Boston & Albany and the New York, New Haven & Hartford railroads, and connected by means of trolley and steam lines through Holyoke and Northampton. From the north, Amherst may be reached by way of Greenfield by the Boston & Maine R. R. All of these important

places lie in the Connecticut river valley and enter into its prosperity and intensive activities. From Boston to Northampton runs the Central Massachusetts division of the Boston & Maine railway. It passes through Amherst within eight miles of Northampton. Amherst is also fed by the Central Vermont railway which runs from Montreal, Canada, to New London on Long Island Sound. A recital of the thoroughfares indicates that Amherst is of easy access, whether from the north, south, east or west.

Amherst is a very beautiful and typical New England village of five thousand inhabitants, overlooking an intensively cultivated section of the Connecticut river valley. To the north lies the



LABORATORY FOR ENTOMOLOGY AND ZOÖLOGY

Toby range of mountains; to the south the Holyoke range with Mount Tom visible at a distance of twelve miles; to the west the Berkshire hills, and to the east the Pelham range. With the valley at its feet and these ranges of mountains round about; with natural beauty contained within by trees, streets, commons, campuses; and with a summer climate that is as likely to be congenial as can be found anywhere, Amherst can lay claim modestly and rightly to its popularity as a summer-home town.

3. **Excursions.** The possibility of monotony may be repeatedly interrupted by delightful excursions on foot over many mountain trails, or by drives over splendid roads piercing the

very centers of nature's most luxuriant adornments. Then too there are the artificially constructed pastimes to be enjoyed in tennis and other games; in specialized dinners at famous New England inns, which are easily reached; in trolley rides which may terminate in very remote places and cities.

Such are some of the many attractions to be found in Amherst for the location of the Graduate School of Agriculture.

**4. The College.** The Massachusetts Agricultural College is one of the oldest agricultural colleges founded under the Morrill Act. It is within one year of its semi-centennial birthday, which it is planning to celebrate. It is the only college of its kind devoted exclusively to agriculture. For the past half century its contributions to agriculture in men, research, advice, are well known. From the time when President French first started it on its fruitful course to the present time, when President Butterfield has broadened its usefulness and increased its power, the same high conception of agriculture has been maintained and the highest scholarship has been fostered.

Excellent buildings have been prepared to care for entomology, botany, veterinary science, horticulture, floriculture and dairying; now the new magnificent agricultural building just completed, and the microbiological building under way, will contribute greatly to efficient work. Many buildings are contemplated and seem likely to appear in the near future,—one for the library, one for chemistry, one for physical culture and drill, etc.—all of which, although they do not exist, furnish the spirit of actuality. Some of the buildings are illustrated by photograph in this pamphlet.

The equipment corresponds to the buildings. The extensive work in chemistry, entomology, botany, pomology, vegetable gardening, landscape gardening, floriculture, dairying, poultry husbandry, bee keeping, and other departmental efforts make a large and comprehensive equipment in laboratories and farms and orchards essential.

The position occupied by the Massachusetts Agricultural College in rural social science is notable; the organization and work of the extension staff have been recognized as directive influences throughout the country; the investigations of the Experiment Stations have been prized; and from its inception the Graduate School has furnished many capable and efficient men.

## GENERAL INFORMATION

The college authorities are prepared to care for large numbers coming for hard work and serious thought, and are arranging for relaxation, as opportunity offers, in pleasurable foot excursions and instructive outings. There will be abundant facilities for games and other amusements when scheduled duties do not call. After the session is over, an organized scheme for presenting historic New England to the members of the School will be available to all who wish to participate.

Rooms may be secured in private homes and dormitories. Meals may be obtained at the commons or private boarding houses, inns and hotels. The combined cost of room and board will vary from five to eight dollars per week. Other expenses are practically the same as elsewhere. The tuition for the session will be ten dollars, which includes all institutional expenses except possible laboratory fees and expenses incurred for excursions of any kind.

All correspondence relating to membership in this School should be addressed to Prof. C. E. Marshall, Assistant Dean, at the Massachusetts Agricultural College, Amherst, Mass.

A prospectus giving more complete information regarding courses, instructors and other matters relating to this School will be issued later.



CAMPUS SCENE







The Massachusetts Agricultural College

SHORT COURSES

WINTER SCHOOLS

1915-16



AMHERST, MASSACHUSETTS



THE  
M. A. C. BULLETIN  
AMHERST, MASS.

Volume VII

Number 6

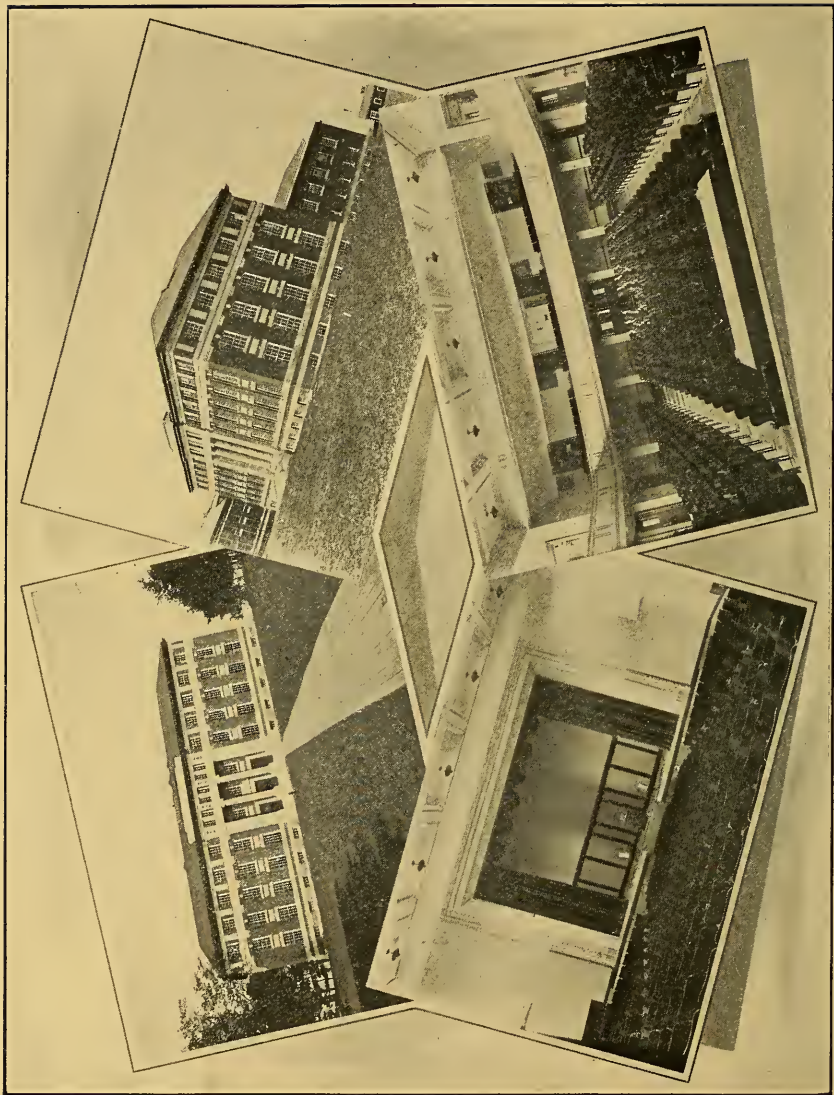
OCTOBER 1915



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MASSACHUSETTS AGRICULTURAL COLLEGE  
JANUARY, FEBRUARY, MARCH,  
MAY, SEPTEMBER, OCTOBER



ENTERED AS SECOND CLASS MATTER  
AT THE POST OFFICE, AMHERST, MASS.



STOCKBRIDGE HALL—AGRICULTURAL BUILDING

## THE SHORT COURSES

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The Short Courses include all the courses which are given at the College, other than those which are included in the regular four-year schedule and the schedule of graduate work. They vary in length from one to ten weeks and are open to both men and women.

This bulletin deals primarily with the main winter short course, designated as the Ten Weeks' Course, but the other winter short courses are described herein and the summer courses are mentioned.

## SHORT COURSES 1916

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### Winter Schools

Apple Packing School . . . . .	Nov. 17 to 23, 1915, Inc.
Ten Weeks' Courses . . . . .	Jan. 3 to Mar. 10, 1916, Inc.
Farmers' Week . . . . .	Mar. 13 to 17, Inc.
Annual Beekeepers' Convention . . . . .	Mar. 14 to 16, Inc.
Polish Farmers' Day . . . . .	Mar. 23
Spring Beekeeping School . . . . .	May 31 to June 14, Inc.

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### Summer Schools

#### Summer School of Agriculture and Country

Life . . . . .	June 26 to July 25
School for Rural Social Service . . . . .	July 11 to July 25
School for Library Workers . . . . .	July 17 to July 22
Poultry Convention . . . . .	July 19 to 21 Inc.
Agricultural Camps . . . . .	During Month of July
Conference on Rural Organization . . . . .	July 25 to 28 Inc.

# THE TEN WEEKS' COURSES

## ANNOUNCEMENT



Ten Weeks' Courses at the Massachusetts Agricultural College are offered to meet the needs of those, both young and old, who desire to study principles and modern methods in agriculture and who for various reasons are unable to attend the four year courses. The work is planned to bring before the student the results of the latest investigations in agricultural science, and to point out their practical application. Ten weeks being a comparatively short period of time, the courses are necessarily exceedingly concentrated and practical and are therefore attractive and valuable to the farmer or the prospective farmer regardless of what his training may have been or how extensive his previous education.

The instruction is given largely by the regular faculty of the college by means of lectures, recitations, laboratory exercises, and practical work; assistance is given from time to time by nonresident lecturers on special subjects. The work in the classroom is supplemented by demonstration work in the laboratory, dairy room, greenhouse and stables. The library of over 48,000 carefully selected volumes offers exceptional opportunities for special study in agriculture, horticulture, and related sciences.

The completion of Stockbridge Hall, the new agricultural building, with its modern laboratories, classrooms and other equipment, means much for the students in the Ten Weeks' Courses. Previously, the instruction has been seriously handicapped, owing to the limited facilities. Now, however, there will be ample provision for both regular and short course students, especially for the laboratory work in the Soils and Crops courses.

Students will be required to elect courses to make not more than twenty-four nor less than twelve exercises each week. The arrangement of courses is such that students must follow certain lines of work. Those electing Field Crops, Market Gardening, Floriculture or Fruit Growing, must also take courses in allied subjects, as noted in the description of these courses. In general agriculture more latitude is allowed, but it is expected that students will show a definite purpose in the selection of work. All elections, as well as any deviation from the regular rule, must be approved by the Supervisor.

FACULTY OF THE TEN WEEKS' COURSES  
1916

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KENYON L. BUTTERFIELD, A. M., LL.D.  
*President of the College*

WILLIAM D. HURD, M.AGR.  
*Director of The Extension Service and Supervisor of Short Courses*

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CHARLES R. GREEN, B. AGR.  
*Librarian of the College*

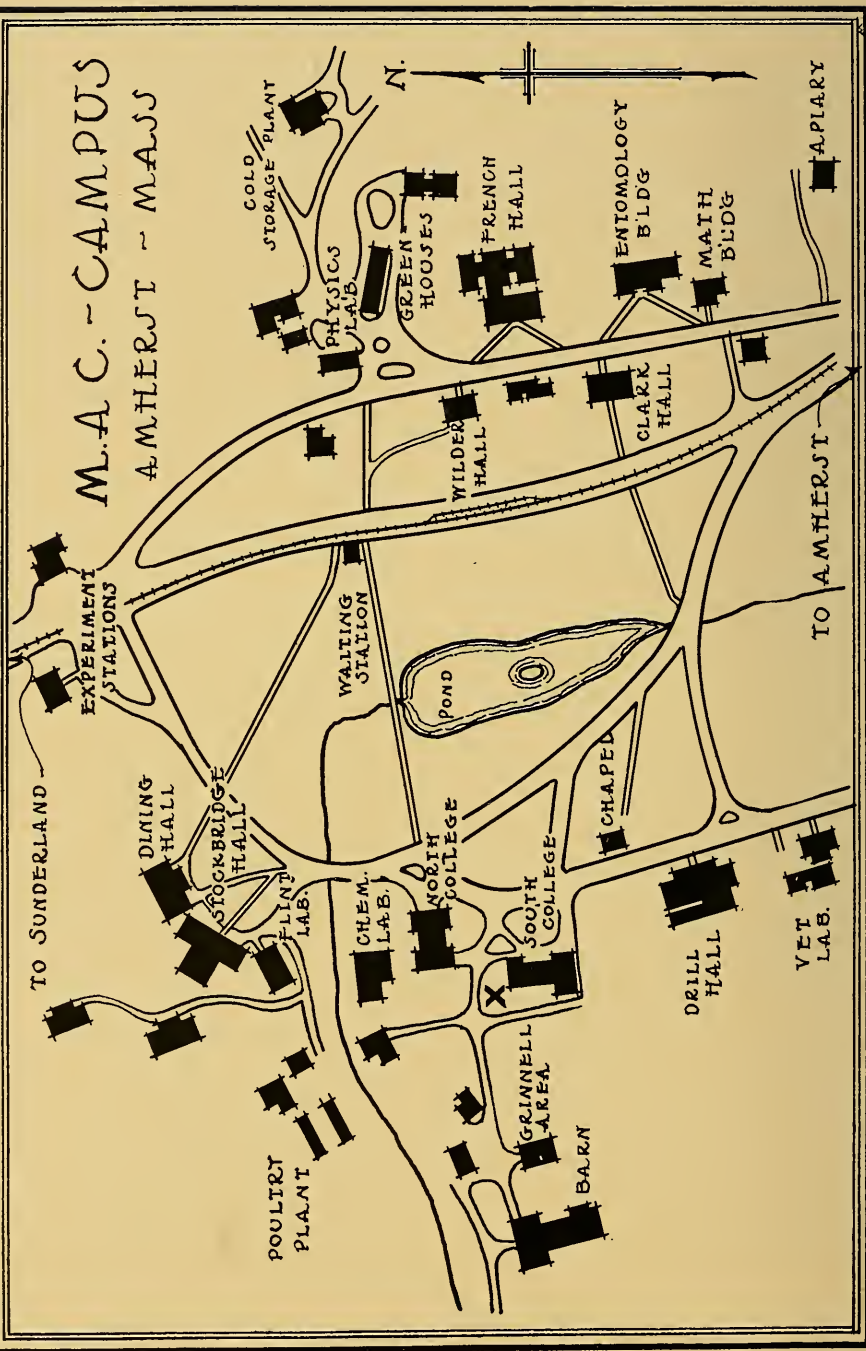
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PAUL J. ANDERSON, A.B., PH.D. Assistant Professor of Botany.	<i>Botany</i>
HAROLD D. BALDINGER, B.SC. Instructor in Dairying.	<i>Dairying</i>
JOHN L. BYARD Superintendent of Apiary.	<i>Beekeeping</i>
ALEXANDER E. CANCE, PH.D. Professor of Agricultural Economics.	<i>Agricultural Economics</i>
WILLIAM D. CLARK, A.B., M.F. Professor of Forestry.	<i>Forestry</i>
SAMUEL COONS Instructor in Dairying.	<i>Dairying</i>
JAMES A. FOORD, M.SC.AGR. Professor of Farm Administration.	<i>Farm Administration</i>
BURTON N. GATES, PH.D. Associate Professor of Beekeeping.	<i>Beekeeping</i>
JOHN C. GRAHAM, B.SC. Professor of Poultry Husbandry.	<i>Poultry Husbandry</i>
CHRISTIAN I. GUNNESS, B.SC. Professor of Rural Engineering.	<i>Rural Engineering</i>
ARTHUR K. HARRISON Assistant Professor of Landscape Gardening.	<i>Landscape Gardening</i>



SIDNEY B. HASKELL, B.Sc. Professor of Agronomy.	<i>Soil Fertility</i>
ORVILLE A. JAMISON, B.Sc. Assistant Professor of Dairying.	<i>Dairying</i>
EARLE JONES, M.S. Assistant Professor of Agronomy.	<i>Field Crops</i>
WILLIAM P. B. LOCKWOOD, M.Sc. Professor of Dairying.	<i>Dairying</i>
CHARLES E. MARSHALL, PH.D. Professor of Microbiology.	<i>Microbiology</i>
JOHN C. McNUTT, B.S.A. Professor of Animal Husbandry.	<i>Animal Husbandry</i>
ARNO H. NEHRLING Associate Professor of Floriculture.	<i>Floriculture</i>
JAMES B. PAIGE, B.Sc., D.V.S. Professor of Veterinary Science.	<i>Veterinary Science</i>
LOYAL F. PAYNE, B.Sc. Instructor in Poultry Husbandry.	<i>Poultry Husbandry</i>
ELVIN L. QUAIFFE, B.Sc.AGR. Assistant Professor of Animal Husbandry.	<i>Animal Husbandry</i>
WILLIAM S. REGAN, PH.D. Instructor in Entomology.	<i>Entomology</i>
FRED C. SEARS, M.Sc. Professor of Pomology.	<i>Fruit Growing</i>
ANDREW S. THOMSON, A.M. Assistant Professor of Market Gardening.	<i>Market Gardening</i>
ARTHUR S. THURSTON, B.Sc. Assistant in Floriculture.	<i>Floriculture</i>
FRANK A. WAUGH, M.Sc. Professor of Landscape Gardening.	<i>Landscape Gardening</i>

# M.A.C. - CAMPUS AMHERST - MASS



Headquarters of Extension Service and Short Courses in north wing of South College—Marked X



AGRONOMY LABORATORY

## COURSES OF INSTRUCTION

### A. Agricultural Group

#### 1. Soil Fertility

*Professor Haskell*

The nature of soils, their chemical and physical properties; tillage; green manuring; crop rotation; drainage; stable manures, their value, composition, preservation, and application; commercial fertilizers, their nature and use; limes and liming; the improvement of "run-down" land. Three lectures a week.

#### 2. Field Crops

*Professor Jones*

The production of field crops for New England; species and varieties, agricultural characteristics, methods of culture, rotations, harvesting, and curing. The laboratory work gives the student practice in seed selection and testing for quality, purity, and germination, and in corn and potato judging. Course 1 required. Two lectures and one two-hour laboratory period a week.

#### 3. Types and Breeds of Live Stock

*Professor McNutt*

Outlines of the market classes and grades of beef cattle, horses, sheep, and swine, placing emphasis upon the characteristics of each



class and its adaptations. The characteristics, the adaptations, and so far as is possible the historic development of each of the more important breeds of live stock are carefully studied, also their distribution in America. Special emphasis is laid upon dairy cattle and horses in the judging work. Three lectures and two two-hour judging periods a week.

#### 4. Live Stock Feeding

*Professor Quaife*

A study of the physiology of nutrition, the composition of feed stuffs, and of rational economic feeding. The feeding of dairy cattle and their management for profitable milk production receive first attention. Similarly, the feeding of horses, of beef cattle, of sheep and swine, are studied. Three lectures a week.

#### 5. Animal Breeding

*Professor McNutt*

A discussion of the more common problems pertaining to the breeding of live stock, their explanation and solution; inbreeding; cross-breeding; grading. The work of the most successful men in history will be studied. Time is given to the study of pedigrees of the different breeds of dairy cattle and other stock. One lecture and one two-hour laboratory period a week.

#### 6. Dairying *Professors Lockwood and Jamison, Mr. Coons and Mr. Baldinger*

Babcock and acid tests; market milk handling; creaming methods; ripening cream and butter making; dairy arithmetic; dairy buildings, lighting, ventilation, and sanitation. Five lectures and one one-hour, two two-hour and two three-hour laboratory periods a week.

#### 7. Dairy Bacteriology

*Professor Marshall*

The characteristics and functions of bacteria and their relation to the different branches of the dairy industry. The scientific basis for cream ripening, sterilization, pasteurization, control of fermentation, and the production of the best quality of market milk. Two lectures a week.

#### 8. Animal Diseases and Stable Sanitation

*Professor Paige*

Lectures upon some of the common diseases of live stock, giving special attention to methods of prevention, care, and sanitation; the treatment of emergencies and accidents; how to keep animals healthy. Two lectures a week.

#### 9. Poultry Husbandry

*Professor Graham and Mr. Payne*

The course consists of lectures on poultry house construction, winter egg production, incubation and brooding, feeds and feeding

and marketing poultry and eggs. There are also one or two demonstration periods per week, depending upon the size of the class. Demonstrations or practical work in killing, picking, caponizing, sorting and packing eggs for market, judging fowls for egg production, studying types, and studying construction of incubators and brooders. Our equipment enables us to demonstrate various methods in housing and feeding. Practical work in running incubators is given to as many as can be accommodated. Class limited to 80. Five lectures and one two-hour laboratory period a week.

**10. Farm Management and Farm Accounts** *Professor Foord*

A study of some of the problems that confront the farmer, such as the choice of a farm, system and types of farming, labor, records, etc. In accounting a simple system is used by which the profits and losses of the farm can be traced to original sources. One lecture on farm management and one two-hour laboratory period in farm accounts each week; students may elect one or both.

**B. Horticultural Group**

**11. Fruit Growing** *Professor Sears*

This course deals with the practical side of the growing and marketing of fruits. Especial attention is given to such questions as selection of site for the plantation, choice of varieties, grafting and budding, spraying, pruning, cultivation and cover crops, fertilizing the fruit plantation, packing and marketing. Lectures, supplemented by demonstrations, and whenever possible, actual work by the student. Students electing Fruit Growing will also be required to take Course 1, and it is recommended that they take Courses 16 and 17. Three lectures and one two-hour laboratory period a week.

**12. Market Gardening** *Professor A. S. Thomson*

This course is designed to acquaint the student with the business of market gardening as conducted in New England. It will consist of lectures, text book assignments and laboratory exercises. The course will be divided into three principal groups: (A) the characteristics of the market gardening business from the standpoints of capital required, location, markets, site, area, soils, and other fundamentals; (B) the application of general agricultural principles to the market gardening business; and (C) market garden crops in detail, with systems of production, in so far as the time will allow. Class limited to 30. Students electing market gardening are required to take Course 1, and it is recommended that they take courses 16, 17, and 18. Three lectures and two two-hour laboratory periods per week.

**13. Landscape Gardening** *Professor Harrison*

The general principles of the art; the various styles of design; the literature of landscape gardening; some notice of important

American masterpieces; elementary problems in drafting and designing; plants, methods of construction, and planting. Class limited to 15. Two two-hour periods a week.

**14. Floriculture**

*Professor Nehrling and Mr. Thurston*

This course is designed to furnish those who have not the time to devote to a longer course with the theoretical and practical considerations essential to success in floricultural work. The course covers as thoroughly as time will permit those aspects of the work of especial interest to a commercial florist. Some of the topics considered are greenhouse construction, greenhouse management, and methods used by the progressive florist. Special trips to some of the up-to-date floricultural establishments in the State are arranged. In addition to the regular lecture work, lectures are usually given by experts in the growing and marketing of special crops such as roses, carnations, violets, and orchids. Course limited to 15 students and to those who are interested in commercial floriculture. Students electing this course will also be obliged to take courses 1, 16 and 17. Three lectures a week; field trips on Saturday.

**15. Forestry**

*Professor Clark*

Designed to acquaint students with the importance of conserving the forests and forest products; the value of the forests to the state and nation; special attention given to the handling of the farm woodlot. One lecture a week.

**G. Related Sciences**

**16. Botany**

*Professor P. J. Anderson*

A study of the structure, functions, and diseases of greenhouse, garden, orchard, and field crops, together with methods of disease prevention, including spraying and the application of fungicides. Two lectures a week.

**17. Entomology**

*Dr. Regan*

A study of the insects causing most injury to farm, orchard, garden and greenhouse crops, and to domestic animals, with methods for their destruction or control. Closely correlated with the work in horticulture and agriculture. Three lectures a week.

**18. Beekeeping**

*Professor Gates and Mr. Byard*

This course deals with fundamental and practical apiculture and its relation to horticulture (field and greenhouse market gardening, cranberry culture, fruit raising.) The following subjects will be included: the natural history and behavior of bees; races, their handling and manipulation; handling of queens; wintering; comb and extracted honey production; the care of crops; diseases and

their treatment; a thorough study of appliances. First hand experience in all phases of the subject is emphasized. A large collection of implements affords excellent opportunity for demonstration. Two lectures and one two-hour laboratory period a week.

The course will be concluded by the Annual Beekeepers' Convention which prominent authorities will attend. (See also Beekeeping School, page 22.)

**19. Farm Mechanics**

*Professor Gunness*

Study of tillage, seeding and harvesting machinery; steam and gas engines; practice given in babbitting and fitting bearings, lining shafts and pulleys, lacing belts and packing valves; use of concrete for floors, walks, foundations, tanks and posts. One lecture and one two-hour laboratory period (two sections) a week.

**20. Rural Sanitary Science**

*Professor Marshall*

The following subjects are considered: Significance of sanitary science; theories of disease; dirt and its dangers; drinking water and its protection; sewage, methods of disposal and purification; ventilation; foods; flies and mosquitoes in relation to sanitation; disinfectants, etc. Two lectures a week.

**21. Rural Improvement**

*Professor Waugh*

Civic art as applied to rural conditions; the improvement of roads, street trees, schoolhouses and grounds, public buildings; farm buildings, farm planning, etc.; the organization and management of village and country improvement societies. Two lectures a week.

**22. Problems of Marketing and Distribution**

*Professor Cance*

A discussion of some of the practical problems confronting the farmer in the disposal of his products and the purchasing of his supplies, with suggestions for remedies; characteristics of the agricultural market; direct sales versus the commission man system; the necessity of standardizing and grading products; the method of organizing for the purposes of producing, buying, and selling. Two lectures a week.



A CONNECTICUT VALLEY FARM

# TEN WEEKS' COURSES—1916

		MORNING HOURS					AFTERNOON HOURS					
		7:40	8:10—9:00	9:10—10:00	10:10—11:00	11:10—12:00	1:10—2:00	2:10—3:00	3:10—4:00	4:10—5:00		
MONDAY	CHAPEL	DAIRYING FRUIT GROV. MARK. CARD.	TYPES & BREEDS POULTRY FLORICULT.	SOILS	FEEDING ENTOMOLOGY	But. Mak. 1 & 2 Market Milk 3 Babcock 5 & 6 Market Gardening	But. Mak. 1 & 2 Market Milk 3 Babcock 5 & 6 Market Gardening	But. Mak. 1 & 2 Types & Breeds II	But. Mak. 1 & 2 Types & Breeds II	Types & Breeds II Dairy Arith. 1,2,3		
TUESDAY		DAIRYING POULTRY BOTANY RUR. IMPR.	FIELD CROPS MARK & DIST.	DAIRY BACT. BEEKEEPING AN. DISEASES	AN. BREED. FORESTRY RU. SAN. SCI.	But. Mak. 1 & 2 Market Milk 4 Fruit Grov. I	But. Mak. 1 & 2 Market Milk 4 Fruit Grov. I	But. Mak. 1 & 2 Animal Breed I Farm Manage.	But. Mak. 1 & 2 Animal Breed I Farm Manage.	Animal Breed I Farm Manage.		
WEDNESDAY		DAIRYING FRUIT GROV. MARK. CARD.	TYPES & BREEDS POULTRY FLORICULT.	SOILS	FEEDING ENTOMOLOGY	ASSEMBLY	But. Mak. 3 & 4 Market Milk 5 Babcock 1 & 2 Land. Gard. Beekeeping Poultry I	But. Mak. 3 & 4 Market Milk 5 Babcock 1 & 2 Land. Gard. Beekeeping Poultry I	But. Mak. 3 & 4 Market Milk 5 Babcock 1 & 2 Land. Gard. Beekeeping Poultry I	But. Mak. 3 & 4	FARM MECH.	
THURSDAY		DAIRYING POULTRY BOTANY RUR. IMPR.	FIELD CROPS MARK. & DIST.	DAIRY BACT. BEEKEEPING AN. DISEASE	FARM MAN. RU. SAN. SCI.	But. Mak. 3 & 4 Market Milk 6 Fruit Grov. II	But. Mak. 3 & 4 Market Milk 6 Fruit Grov. II	But. Mak. 3 & 4 An. Breeding II Farm Mech. I	But. Mak. 3 & 4 An. Breeding II Farm Mech. I	An. Breeding II Farm Mech. I		
FRIDAY	CHAPEL	DAIRYING FRUIT GROV. MARK. CARD.	TYPES & BREEDS POULTRY FLORICULT.	SOILS	FEEDING ENTOMOLOGY	But. Mak. 5 & 6 Market Milk 1 Babcock 3 & 4 Market Gard.	But. Mak. 5 & 6 Market Milk 1 Babcock 3 & 4 Market Gard.	But. Mak. 5 & 6 Types & Breeds I	But. Mak. 5 & 6 Types & Breeds I	Types & Breeds I Dairy Arith. 4,5,6		
SATURDAY			TYPES & BREEDS I Field Crops I Land. Gard.	TYPES & BREEDS II Field Crops II Floriculture	TYPES & BREEDS II Field Crops II Floriculture	But. Mak. 5 & 6 Market Milk 2 Poultry II Farm. Mech. II Floriculture	But. Mak. 5 & 6 Market Milk 2 Poultry II Farm Mech. II Floriculture	But. Mak. 5 & 6	But. Mak. 5 & 6	Floriculture	Floriculture	

*Italics indicate Laboratory Periods.*  
 Types & Breeds I same men as Dairying 1-2-3.  
 Types & Breeds II same men as Dairying 4-5-6.  
 Poultry Laboratory sections III and IV by arrangement.



MASSACHUSETTS AGRICULTURAL COLLEGE

TEN WEEKS' COURSES

Application Blank

I hereby make application for admission to the Ten Weeks' Courses which are to begin January 3, 1916. I am enclosing the registration fee of five dollars (\$5.00) in cash, check or money order. (Designate which one)

Name (Mr., Mrs., or Miss).....
Date of Birth.....Date of Application.....
Street Address.....Post Office.....
State.....Present Occupation.....
Previous Education.....
Reference (name and address).....
Name and address of person to notify in case of illness or accident.....

After consulting the schedule on page 14, place an X before each course you wish to take. Send this blank to the Supervisor.

GROUP A

Table with 2 columns: Course, Hours. Rows include Soil Fertility, Field Crops, Types and Breeds of Live Stock, Live Stock Feeding, Animal Breeding, Dairying, Dairy Bacteriology, Animal Diseases and Stable Sanitation, Poultry Husbandry, Farm Management and Farm Accounts.

GROUP B

Table with 2 columns: Course, Hours. Rows include Fruit Growing, Market Gardening, Landscape Gardening, Floriculture, Forestry.

GROUP C

Table with 2 columns: Course, Hours. Rows include Botany, Entomology, Beekeeping, Farm Mechanics, Rural Sanitary Science, Rural Improvement, Marketing and Distribution.

Note that the grouping and the schedule allow the following of definite lines of study. Soil fertility may be combined with any of the several subjects in groups A, B and C. Those who plan to specialize in dairy work will find it possible to take soil fertility and field crops and the majority of the animal husbandry and dairy courses. Those desiring to combine poultry husbandry with fruit growing or market gardening may arrange a very good schedule including related subjects. The majority of courses in group C can be taken in connection with a definite line of study based upon the courses in groups A and B.

NOTE: — Registration fee must accompany this application. Make check or money order payable to The Massachusetts Agricultural College.

Fee.....
Date Received.....
Reference .....

(TEAR OFF HERE)



## REQUIREMENTS FOR ADMISSION

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WINTER VIEW ON CAMPUS

No entrance examinations are required, but students are advised to review their school work in English and arithmetic before entering. Practical experience in farm, garden, orchard, or greenhouse work is an advantage. The courses are open to both men and women.

Students must be at least 18 years of age, and must furnish satisfactory evidence of good moral character. References are required and these are investigated before applicants are accepted.

Application for admission should be made as early as possible by filling out the blank on Page 15 of this bulletin. It is sometimes necessary, when the registration becomes too large, to limit the numbers in certain courses. In limited courses, students

are accepted in the order of registration as shown by date on application blank.

Those who are late in entering are admitted only on consent of the instructors in the courses desired.

Students who complete satisfactorily 60% of the courses in which they register will receive a certificate.

Students should report to the Supervisor on Monday, January 3, in order to begin work promptly on the morning of January 4.

## EXPENSES AND OTHER INFORMATION

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A registration fee of \$5 is charged those who take the Ten Weeks' Courses. This fee is payable upon presentation of the application blank.

Other expenses in connection with the courses are about as follows:

Furnished rooms in private families . . . . .	\$1.50-\$3.00 per week
Board at College Dining Hall . . . . . (about)	\$4.25 per week
Board in private families . . . . .	\$5.00-6.00 per week

A Lunch Counter is operated in connection with the College Dining Hall, at which meals may be secured à la carte at very reasonable prices. There are also several restaurants in the village which offer very reasonable rates.

Students in each of the dairy courses must provide themselves with two white wash suits, and a white cap for use in the practical dairy work. The cost in Amherst is about \$1.25 for suit and cap.

Text books are required in certain courses, and their purchase is recommended in others. The cost of this item should not exceed an average of \$5.00.

A list of available rooms is furnished at registration time, and every effort will be made to see that all who come are comfortably located.

## A SUGGESTION TO NEW STUDENTS

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The college is anxious that Short Course students derive as much benefit as possible during their stay at the college. The suggestion is here made, therefore, that those students who have had little or no experience in practical agriculture as well as those who wish to better inform themselves on the subjects in which their chief interest lies, do some systematic reading on those subjects previous to coming to the college to take up the work.

"Elements of Agriculture," by Warren, published by the Macmillan Company, is suggested as a general book covering agriculture and horticulture in their various phases. This book contains chapters upon the various specialties.

For those who care to go still further in preliminary reading the following books are suggested:

Course 1, "First Principles of Soil Fertility," Vivian; Course 3, "Types and Breeds of Farm Animals," Plumb; Course 4, "Feeds and Feeding," Henry; Course 6, "Milk and its Products," Wing; Course 7, "Bacteria in Milk," Conn; Course 9, "Productive Poultry Husbandry," Lewis; Course 11, "Principles of Fruit Growing," Bailey; Course 14, "Principles of Floriculture," White; Course 15, "New England Trees in Winter," Blakeslee & Jarvis; Course 16, "Practical Botany," Bergen & Caldwell; Course 17, "Elementary Entomology," Sanderson & Jackson; Course 19, "Farm Machinery and Farm Motors," Davidson & Chase; Course 21, "Rural Improvement," Waugh; Course 22, "Rural Economics," Carver, and also an article on "Community Organization" by Carver in the United States Department of Agriculture Yearbook for 1914.

These books may be obtained from publishers or from the Johnson Book Company, Amherst, Mass.

## RULES AND REGULATIONS

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Those who attend the short courses are expected to conduct themselves in a manner that will conform to the usages of good society.

As a guide to those who come to the college for the first time the following extracts are taken from the regular rules of the college:

“The customary high standard of college men in honor, manliness, self-respect, and consideration for the rights of others, constitute the standards of student deportment.

“It should be understood that the college, acting through its President or any administrative officer designated by him, distinctly reserves the right not only to suspend or dismiss students, but also to name conditions under which students may remain in the institution.”

## CHAPEL AND ASSEMBLY

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For the past two or three years, the limited seating capacity of the Chapel has precluded the attendance of Short Course students at morning Chapel and Wednesday Assembly. The new auditorium in Stockbridge Hall, seating one thousand people, now permits the attendance of Short Course pupils at the regular exercises. All Ten Weeks' Course students, therefore, will be required to attend morning Chapel on Monday and Friday at 7:40, and on Sunday at 9:15, and mid-week Assembly at 1:10 on Wednesday. These gatherings are all held in the auditorium in Stockbridge Hall.

## ORGANIZATIONS

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During the past several years short winter course students have maintained an organization for social, recreative, and study purposes. This organization has met each week during the course.

The Stockbridge Club is a student organization which holds meetings every week for the discussion of agricultural and horticultural

tural subjects. Its meetings are often addressed by well-known specialists. Membership is open to students of the short courses.

The Collegiate Country Life Club, which meets twice each month deals with country life problems other than those having to do with the practical side of farming.

The college Y. M. C. A. meetings, conducted by students and outside speakers, are held regularly on Thursday evenings, at 6:45 o'clock, in the Chapel. All Short Course students are cordially invited to attend these meetings.

All Short Course students of the Catholic faith are invited to affiliate themselves with the Catholic Club.

### THE LIBRARY

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The college library occupies the entire lower floor of the Chapel building and contains nearly 48,000 volumes in addition to a large number of pamphlets. The equipment is such that the library ranks extremely well with the agricultural libraries of the country. Short Course, as well as regular students, are able to find splendid material in every line of college work, especially in agriculture, horticulture, botany, entomology, and sociology. The reading room is provided with a variety of magazines, encyclopedias, and reference books, in addition to the newspapers and agricultural weeklies.

Branch libraries and reading rooms are maintained in some of the department buildings and are open to Short Course students.

The library hours are from seven-thirty a. m. to nine-thirty p. m. every week day, excepting meal time, and from nine a. m. to two p. m. on Sundays, chapel hour excepted. The librarian and his assistants are constantly on hand, ready and willing to be of assistance to Short Course students.



## OTHER WINTER SHORT COURSES

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### APPLE PACKING SCHOOL

November 17—23, 1915, Inclusive

The work of this School, which is conducted by the Department of Pomology, is of a practical nature and includes both box and barrel packing. Persons taking the course become familiar with the various styles of packs and receive sufficient practice to enable them to do good commercial packing.

The work in packing is supplemented by lectures on leading phases of commercial orcharding, such as planting, varieties, spraying, pruning, harvesting, marketing, and so forth.

A fee of \$5.00 to help pay for fruit and other materials used is charged for this course. The course is limited to 30 students.

### FARMERS' WEEK

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March 13—17, 1916



In order to reach those who cannot come to the college for a longer time, this very practical course, four days in length, is given. The regular college equipment is used, and the work of the regular faculty is supplemented by lectures and demonstrations given by eminent men.

Last year, owing to the prevalence of the foot and mouth disease, it was deemed inadvisable to hold Farmers' Week. This was very disappointing to the college as well as to many hundreds of persons who had been laying plans to attend. This year, therefore, special efforts will be put forth to make the 1916 Farmers' Week of even more vital interest and attraction than usual.

The 1916 program will probably consist of 7 sections: (1) Field Crops and Farm Management; (2) Animal Husbandry and Dairying; (3) Poultry Husbandry; (4) Fruit Growing, Market Gardening, Floriculture, and Forestry; (5) Women's Section, Home Economics; (6) Farmers' Business Organizations; (7) Beekeeping.

Features of the week are the evening lectures by specialists along agricultural lines, the practical demonstrations of approved

methods in agriculture and home economics, the milk, cream and butter exhibit, the corn and potato shows, the commercial exhibits and agricultural motion pictures.

Exceptionally good examples of the dairy breeds of cattle and of draft horses are used during this week and a parade of live stock is arranged.

There are exhibits of poultry feeds, various types of houses and poultry house equipment. The incubators and brooders are running to their fullest capacity at this time of year and guides are furnished to conduct visitors about the poultry plant.

The Annual Beekeepers' Convention, March 14 to 16, is also a feature of the week. Illustrated lectures, practical demonstrations and commercial displays are features of the convention.

The M. A. C. Agricultural Improvement Association, M. A. C. Short Course Association and other organizations hold their annual meetings at the college this week.

The complete program will be published about February 1. Apply to the Supervisor of Short Courses.

## **POLISH FARMERS' DAY**

**March 23, 1916**

A special day is set aside in March of each year which is known as Polish Farmers' Day. There are hundreds of Polish farmers in the Connecticut Valley and this day represents a special effort on the part of the college to be of service to them. Instruction is given relative to the crops and animals in which these people are most interested, soil fertility problems, coöperation, American citizenship, Polish and American history, etc. The services of an interpreter make the days' exercises of added interest and value.

## **SPRING BEEKEEPING SCHOOL**

**May 31—June 14, 1916**

This itinerant school is held in Amherst once in three years and extension schools are planned for different sections of the state during the intervening years. It is an intensive course, primarily for a limited number of practical beekeepers. The course, conducted by a strong staff of specialists, occupies seven hours daily for two weeks (Saturdays being devoted to excursions), and comprises lectures, laboratory practicums and field excursions. It is under the direction of Burton N. Gates, Associate Professor of Beekeeping.



The College maintains a practical beeyard of about fifty colonies, as well as outyards, with a well-appointed beehouse and laboratories, besides a wax working laboratory, library, and beekeeping museum. Exceptional facilities are afforded the student in this subject.

### Courses

1. *Practical beekeeping.* Lectures: laboratory practice in the general work of the beekeeper; beekeeping equipment, practices in the preparation of materials, location of the apiary; commencing with bees, handling of bees, practice in beeyard procedure; spring manipulation, fall preparation, wintering; extracted-honey production; bee diseases and their treatment, apiary sanitation; making increase, elements of queen rearing, etc.  
BURTON N. GATES                      Associate Professor of Beekeeping  
JOHN L. BYARD                              Superintendent of the Apiary
2. *Life of the honeybee.* Lectures.  
HENRY T. FERNALD                      Professor of Entomology
3. *Special problems of the beekeeper.* Lectures: demonstrations in requeening, the races of bees, the introduction of queens; swarming and handling swarms, comb honey production, enemies of bees.  
JAMES B. PAIGE                              Professor of Veterinary Science
4. *Crops foraged by bees.* Lectures: field excursions.  
WILLIAM P. BROOKS                      Director of the Experiment Station
5. *The relation of bees to the pollination of plants, including coloration, odor, nectar secretion.* Lectures: laboratory work in blossom structure and dissection.  
A. VINCENT OSMUN                      Associate Professor of Botany
6. *Bees in horticultural practices; fruit production, market gardening, cranberry culture and greenhouse cucumber growing; beekeeping as affected by spraying practices.* Lectures: field work.  
WALTER W. CHENOWETH              Associate Professor of Pomology

It is desirable to apply for this course early as it has been found necessary to limit the school to fifteen students. Students will be accepted in the order of application as shown by date of letter.

A fee of two dollars is charged to cover all laboratory expenses. Equipment such as is made by the students, may be purchased at cost. Full announcement of this course will be issued about April 1, 1916.

The Annual Convention, formerly held as the conclusion of this course, is announced for March 14-16, inclusive, during Farmers' Week. (See above.)

# SUMMER SCHOOLS

1916

## GRADUATE SCHOOL OF AGRICULTURE

A Graduate School of Agriculture of four weeks' duration is held every other year at some state college or university in the United States. In 1916 this school is to be held at the Massachusetts Agricultural College July 3 to 28, inclusive. This is the first time that this Graduate School has been held in New England and rather elaborate plans are being laid. It is under the auspices of the American Association of Agricultural Colleges and Experiment Stations and Dr. A. C. True, Director of the federal States Relations Service, is the Dean of the school. It is open to college graduates in all the professions of life. Certain sessions will be open to the students in the Summer School of Agriculture and Country Life which will be in session at the same time. Full details regarding the Graduate School can be secured by addressing Prof. Chas. E. Marshall, Amherst, Massachusetts, who is the Assistant Dean.

## THE SUMMER SCHOOL OF AGRICULTURE AND COUNTRY LIFE

June 26—July 25

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### Announcement

The Summer School of Agriculture and Country Life of the Massachusetts Agricultural College will open June 26, 1916 for a term of four weeks. This will be the ninth session of this Summer School, those of past years having been highly successful. The experience of past years will aid in making material improvements in the session of 1916.

The work of the Summer School was designed originally for school teachers, and the attendance has been largely of that class. Special attention will be given to the needs of teachers again in 1916.



SUMMER SCHOOL CLASS

It has been found, however, that there are many persons who seek a general knowledge of theoretical and practical agriculture and who can come to the College conveniently during the summer season. Practical courses will be offered for the benefit of such persons also.

The following courses are planned for 1916:

Soil Fertility	Bird Life
Breeds of Live Stock	Insect Life
Dairying	Entomology
Poultry Husbandry	Beekeeping
Fruit Growing	Handicrafts and Practical Arts
Practical Gardening	Farm Management
Floriculture	The Farmers' Coöperative Exchange
Forestry	Home Economics
Landscape Gardening	Cookery
Civic Improvement	Rural School Home Economics
Inorganic Agricultural Chemistry	Practical Nursing
Organic Agricultural Chemistry	Agricultural Economics
Plant Experiments	Home and School Gardens
Botany	Organized Play

From these courses it is possible to make up programs of work suitable to the needs of almost everyone, but especially of school teachers, principals, superintendents, school committeemen, farm owners, householders, suburban residents, clergymen, pastors, preachers, social workers, and those who have only a general interest in agriculture. Persons who are in doubt as to what courses will best suit their needs should correspond with the Supervisor of Short Courses, who will gladly advise in all such matters.

Special courses covering two weeks are offered for clergymen and other rural leaders. See the "School for Rural Social Service."

## General Plans

From the courses offered, each student may elect courses of not less than ten or more than fifteen exercises a week, unless a larger or smaller amount of work is allowed by the Supervisor. These courses include a large amount of field work, observation trips, out-door exercises and laboratory experiments.

Besides these, general field exercises are arranged for one afternoon of each week. These are on topics of interest to all. Short excursions are arranged for every Wednesday afternoon, and more extended excursions for the whole school are planned for every Saturday. These excursions are personally conducted by members of the faculty, as heretofore. In the past, they have proved a very enjoyable feature of the work.

Round tables and special discussions are arranged by various instructors, as their courses require.

A course of evening lectures on popular topics relating to the work of the school is a feature of the general program. Several able lecturers are engaged for this course each year. This lecture course is entirely free to all students.

The expenses are low. Amherst is situated in one of the most noted historical and educational centers in the country. Anyone interested in problems pertaining to country life should not fail to attend. A descriptive circular can be had April 1, 1916.

## SCHOOL FOR RURAL SOCIAL SERVICE

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July 11—25

This year special emphasis will be laid upon the group of courses given particularly for those who might be classed as rural social workers. These courses are intended for clergymen, librarians, teachers, town officers, grange workers and others who devote a considerable portion of their time to problems of community development.

From the courses offered a group of studies may easily be arranged which will present the rural problem from several standpoints, and will serve to show the relationships of the workers in the different lines to their respective fields and to the larger community problems which are constantly being presented to them.

## Courses Offered

Rural Sociology	Rural Community Planning
Coöperation in Agriculture	Plays and Pageantry
Economic Aspects of New England	Cookery
Agriculture	Civic Improvement
Re-direction of Rural Schools	Small Fruit Growing
Rural Leadership Training	Rural Church Problems
	Rural Organization

Besides these courses there will be conferences on various subjects, some of which are:

Community Organization	School Administration
Boys' and Girls' Club Work	Special Town Celebrations
Town Administration	The Town Fair
Community Engineering	Civic Improvement
	Rural Church Problems and Methods

Several of the courses offered in the regular Summer School of Agriculture and Country Life and the Library School, as well as the Graduate School of Agriculture, which will be held at the Massachusetts Agricultural College, July 3—July 28, inclusive, are also available to those who register in the School for Rural Social Service and pay the required fees.

## SCHOOL FOR LIBRARY WORKERS

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July 17—22

During the summer of 1915 a one week School for Library Workers was held at the College. This was planned for persons interested in the work of the small village or rural library and more especially for those librarians and library assistants who had not been able to benefit by special library training or extended experience. This school will probably be an annual feature of the summer schools hereafter as this first attempt demonstrated its practicability and it seemed to fill an existing need.

## THE POULTRY CONVENTION

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July 19—21, Inclusive

In the preparation of our Fourth Annual Poultry Convention the wishes and needs of the poultrymen and women of the State will be the first and only consideration. It is not often that the poultry public has an opportunity to hear men of national reputation from different parts of the country and it is such men that we secure for this occasion.



POULTRY PLANT, AT M. A. C.

The special features of the program for 1916 will be as follows:

1. Lectures by the best talent that can be secured.
2. Demonstrations in killing, picking, packing and preparation for retail trade.
3. Demonstrations in grading and judging market eggs.
4. Demonstrations in selection and mating both for utility and exhibition purposes.
5. Demonstrations with poultry equipment.
6. Poultry museum. Samples of feeds, equipment, diseased specimens, charts, etc.
7. A small poultry farm in Massachusetts. This will be made one of the special features of the program. Program ready June 1st.

## CONFERENCE ON RURAL ORGANIZATION

July 25—28, Inclusive

The Conference on Rural Organization which has been held for the past five years as a closing feature of the Summer School will take place as usual under the auspices of the following organizations:

The Massachusetts Agricultural College  
The State Board of Education  
The State Department of Health  
The State Grange  
The Massachusetts Civic League  
The Massachusetts Federation of Churches  
The Free Public Library Commission  
The Massachusetts Federation for Rural Progress  
The Massachusetts Federation of Women's Clubs  
International Young Men's Christian Association College  
National Board Young Women's Christian Associations  
The Hampshire County Association of Camp Fire Guardians  
The National League of Women Workers

The various groups making up the conference hold separate sessions each morning, at which time subjects of importance in their

particular lines of work are considered. The afternoons are given up entirely to special and general conferences on what seem to be the most important subjects in our rural life, demonstrations of organized play, recreation, etc. The evenings are given over to music and to lectures by eminent students of rural sociology, economics and education.

This is a **community planning** conference. Its object is to acquaint those who are leaders in their respective communities with the work of actual achievement that is going on, not only in Massachusetts, but in New England and other parts of the world, and to give them instruction and renewed enthusiasm for larger and more intelligent planning in the affairs of their respective communities. The large outstanding problems in the development of Massachusetts agriculture and country life are dealt with in a manner that is materially assisting in their solution.

Teachers, clergymen, grange officers, librarians, county Y. M. C. A. workers, town officers, boards of health, officers of village improvement societies, homemakers, school officers, county agents, boards of trade, vocational and agricultural instructors, and all others interested in community development, are cordially invited to attend this Conference. The expenses for board and room are low.

Program will be ready for distribution June 1st.

## AGRICULTURAL CAMPS

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During July. Dates to be announced



The Boys' Camps are arranged in order that boys from rural districts and small towns may receive some instruction in agriculture, and clean, wholesome sports, and that they may have impressed upon them their responsibilities as coming members of society. Teachers, clergymen, Y. M. C. A. workers are especially urged to send boys who will be benefited by the instruction given at these Camps.

The Camps are under military discipline. Boys who do not care to conform to this are not expected to come. Not more than forty-two boys—reservation being made for

three from each county—will be taken at one time. A succession of these camps, each lasting one week, will be arranged during July. The cost to each boy has in the past, been eight dollars for the week. This fee helps defray the cost of maintaining the camp, meals, instruction, lectures, and so forth.

The daily program consists of Camp duty, flag raising, and so forth; agricultural lessons, talks on hygiene and good citizenship; play and recreation, instruction in handicrafts and photography; evening camp fires, and lectures by men prominent in boys' work.

In 1915, the third camp was composed of the third prize winners in the state-wide boys' and girls' clubs, a separate camp being maintained upon the same general plan for the girl winners. This will undoubtedly be a feature of these camps in the future.

## THE EXTENSION SERVICE

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### Helps for Those Who Cannot Come to Any of the Short Courses

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#### LECTURE COURSES AND PRACTICAL DEMONSTRATIONS

The public lecture work of the faculty has been systematized. Granges, Farmers' Clubs, Young Men's Christian Associations, Boards of Trade, Women's Clubs, Village Improvement Societies, and other organizations can secure single lectures covering agricultural and allied subjects either, or courses of several lectures can be arranged for. Many of these lectures are arranged in coöperation with the Farm Bureaus and County Agents where these are already in the field. Practical demonstrations on such subjects as spraying, milk testing, stock judging, mixing fertilizers, fruit grading and packing, and others of a similar nature, will also be given when application is made for them. Organizations named above can arrange with the college to have a series of evening meetings, at which agricultural subjects and topics pertaining to rural life will be presented in a popular way. It should be understood that the number of men available for this work is at present limited; hence early application is desirable. The first duty of the regular faculty, of course, lies with their college classes and no engagements will be made which seriously interfere with their regular work.

Send for circular giving lecturers' names and subjects.



## CORRESPONDENCE COURSES

So many calls have come to the college for lessons by correspondence that courses in Soils and Soil Improvement, Manures and Fertilizers, Field Crops, Farm Dairying, Fruit Growing, covering apples, peaches, pears, plums, cherries and small fruits, Market Gardening, Animal Feeding, Floriculture, Farm Accounts, Beekeeping, Forestry, Shade Tree Management, Entomology and Poultry Husbandry, Rural Sociology, Home Economics and Community Planning have been prepared.

A small fee which partially covers the cost of postage, etc., is charged for each course. Send for circular fully describing these.

## OTHER LINES OF WORK CONDUCTED BY THE EXTENSION SERVICE

Through its Extension Service the Massachusetts Agricultural College endeavors to help all the people in the Commonwealth who are interested in securing agricultural information. A corps of field agents is maintained to carry up-to-date information to all who ask for it.

The college is now prepared to do definite, organized work in the following lines:

Extension Schools	Civic Betterment
Exhibits at Fairs, etc.	Agricultural Education (Boys' and
Community Organization	Girl's Clubs, etc.)
Agricultural Surveys	Home Economics
Farmers' Business Coöperation	Rural Credit Systems
Fruit Growing	Demonstration Plots
Dairying	Advisory Work With Institutions and
Animal Husbandry	Individuals
Poultry Management	Publications
Farm Management (Coöperating with	Advice by Personal Conferences and
U. S. D. A.)	Letters

The college is in constant and intimate touch with the farm bureaus, improvement leagues and county agents throughout the state and much extension work is done through these agencies. The college also stands ready to coöperate with granges, farmers' organizations, and commercial bodies in the furtherance of substantial extension work.

For further information, regarding any of the activities of the Extension Service or to register in any of the Short Courses, write or apply to

WM. D. HURD,

Director of Extension Service, and Supervisor of Short Courses,  
Massachusetts Agricultural College, Amherst, Mass.

**DIRECTORY — INFORMATION MAY BE SECURED FROM THE MASSACHUSETTS AGRICULTURAL COLLEGE AS INDICATED BELOW**

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**A. The College**

Those desiring college catalogs, the President's annual report, and other pamphlets giving full information relative to entrance requirements, courses of study, expenses, opportunities for student labor, and so forth, should address President Kenyon L. Butterfield, Amherst, Mass.

All questions regarding admission to the College, either to the freshman class or to advanced standing should be addressed to Professor P. B. Hasbrouck, Registrar, Amherst, Mass.

**B. The Experiment Station**

The Experiment Station conducts investigations in as many lines of agricultural science and practice as its funds will permit. It has charge of the inspection of commercial fertilizers, commercial feeding stuffs and milk testing apparatus. Branch stations in cranberry and asparagus culture are maintained in other sections of the state.

The Station considers the farmers' problems to be its problems, and desires to keep in touch with them.

Requests for bulletins reporting the results of experiments and inspections and for other information on the work of the Station should be addressed to William P. Brooks, Director of the Experiment Station, Amherst, Mass.

**C. The Graduate School**

Questions relating to courses offered leading to the degrees of Master of Science and Doctor of Philosophy, admission and work required, should be addressed to Dr. Charles E. Marshall, Director of the Graduate School, Amherst, Mass.

**D. The Extension Service and Short Courses**

Inquiries of a general nature regarding the work of the Extension Service, the Short Courses, publications, or requests for new lines of work should be addressed to William D. Hurd, Director of the Extension Service and Supervisor of Short Courses, Amherst, Mass.





















