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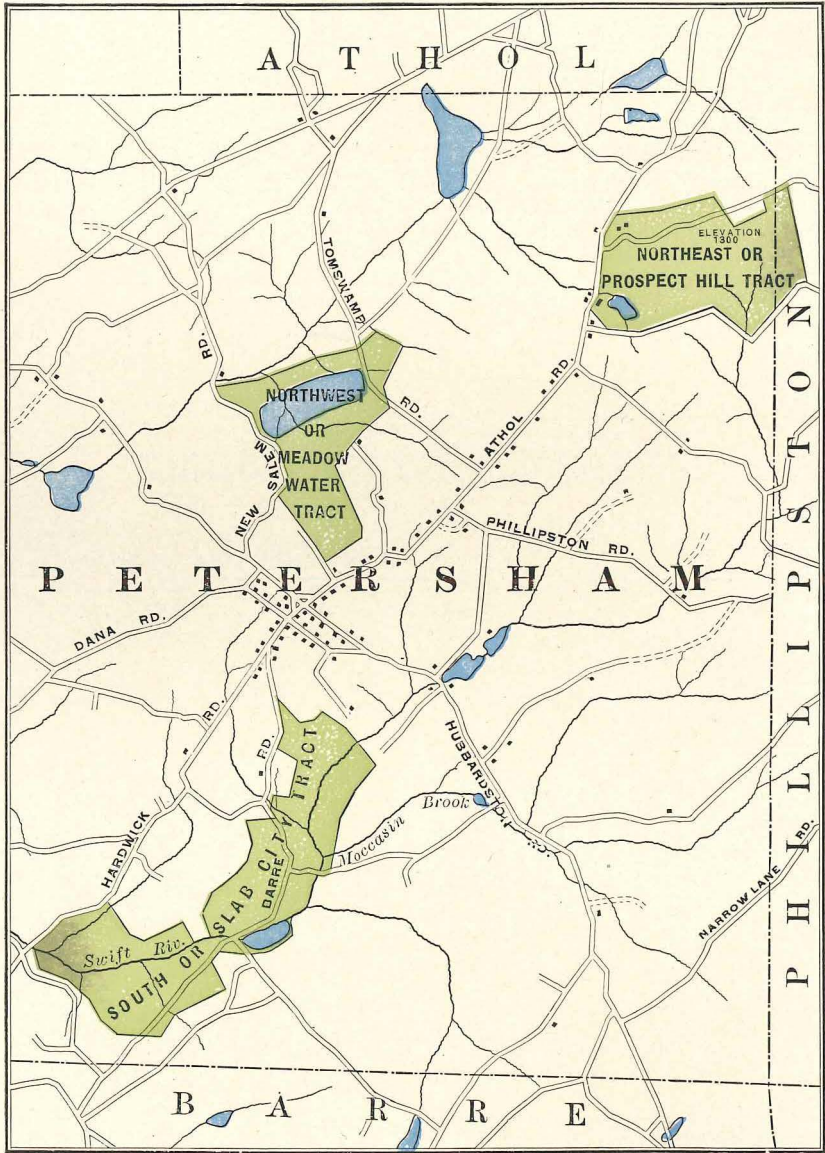
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The Annual Reports of the President and of the Treasurer.

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fessional Schools of the University; the Announcements
of the several Departments; etc., etc.



HARVARD UNIVERSITY: HARVARD FOREST, PETERSHAM, MASS., 2,000 ACRES

INSTRUCTORS

RICHARD THORNTON FISHER, A.B., M.F., *Assistant Professor of Forestry, and Chairman of the Division of Forestry.*

EDWARD CHARLES JEFFREY, Ph.D., *Professor of Plant Morphology.*

JOHN GEORGE JACK, *Assistant Professor of Dendrology.*

CHARLES THOMAS BRUES, S.M., *Instructor in Economic Entomology.*

IRVING WIDMER BAILEY, A.B., M.F., *Instructor in Forestry.*

———, *Instructor in Forestry.*

FACULTY OF ARTS AND SCIENCES

DIVISION OF FORESTRY

GENERAL STATEMENT

The professional course in Forestry offered by Harvard University is organized with a view to meeting, and, in a measure, anticipating, developments in the field for employment. Forestry is still a new and not yet clearly established profession, and its progress depends very largely on the skill with which its pioneers meet the problems now confronting the chief forest owners of the country. At present the main employers of foresters are the National Government and the States. Private and corporate owners, although they take on each year an increasing number of trained men, employ so far relatively few. Yet it is likely that as forestry becomes recognized, and its practice financially justifiable, private work will offer an even more attractive opening than public. Whatever the field, success involves not only a thorough technical training, but also a practical insight into methods and conditions actually obtaining in the forest industries. Thus a forester who is to do the best constructive work, and contribute to the making of his own opportunities, should have had substantial experience in logging and the lumber business, at least for some one region, and if possible also in the application of intensive forestry to a given forest.

The arrangement of the course, which covers two years, is designed to give the student the maximum of field work and experience in connection with the management of the Harvard Forest at Petersham. The academic year is divided into three terms, — a spring and an autumn term devoted to work in the woods, and a winter term devoted to lectures, laboratory, herbarium and arboretum work in Cambridge. The annual operations on the Harvard Forest, in which the students participate, include for the first-year men in October and November elementary work in dendrology, silviculture, and forest measurements, and in April and May, the

construction of a working plan, forest planting and nursery work, practice in marking for cuttings, and work in the saw-mill. During the winter term, extending from December 1 to April 1, and while the students are in Cambridge, the course includes wood structure, dendrology, protection, the practice of forestry in the forest regions of the United States, and the theory of forest management. In the autumn of the second year, at Petersham, the class carries out the logging operations planned in their work of the preceding spring, taking part in the regular woods work of felling, sawing, yarding, etc. In addition each man is assigned a topic connected with the application of forest management upon which he prepares a thesis. Upon the return to Cambridge, and in continuation of the elementary practical work carried out in the Harvard Forest, the class begins the study of general lumbering in its engineering, executive, and business aspects. This course consists of lectures, reading, and the careful study of a large, typical logging operation. For this purpose three weeks are spent during January in making a report upon the working and organization of a single company. This assignment follows introductory lectures on the broad principles governing methods and costs of lumbering and precedes subsequent work on lumbering in the different forest regions of the United States. In addition to lumbering, the winter term of the second year includes courses in forest products, forest entomology, and forest history and administration. The final spring term is devoted to an extended field problem involving the examination and valuation of a large tract of wild land. This problem covers methods of woods surveying, the estimation of standing timber, and the study of the feasible methods of logging and management for the tract in question. Through this correlation of work in the two years' course a student is enabled to get an increasingly practical and clear knowledge of the underlying organization of typical forest industries. He is in close touch with the progress of the annual operations on the Harvard Forest, and his technical instruction is developed with constant reference to its use in a representative case.

ADMISSION

Membership in the School of Applied Science is open to men who are graduates of a college or scientific school in good standing. Other men of suitable age and attainments may also be admitted by the Administrative Board of the School by special vote in each case, but such admission does not imply admission to candidacy for a degree.

Students of special advanced subjects will be admitted to any courses for which their previous training fits them upon obtaining the approval of the Division.

PLAN OF STUDY FOR THE DEGREE OF
MASTER IN FORESTRY

The preparation which is necessary and which must ordinarily be completed before entering upon the technical studies for the degree of Master in Forestry includes a satisfactory knowledge of Botany and Geology; elementary Physics, Chemistry, Zoölogy, and Economics; Trigonometry, Plane and Topographic Surveying; a reading knowledge of French or German. Students who upon entrance are deficient in Plane and Topographic Surveying may take the six weeks' summer course (Engineering 4a) at Squam Lake either before or immediately after their first year in Forestry. The rest of the preparatory subjects will usually have been covered during the college course.

The Division of Forestry will recommend for the degree of Master in Forestry a student who, having fulfilled these requirements, passes with credit in the courses enumerated in the following schedule:

PROGRAMME IN FORESTRY

FIRST YEAR

Autumn Term		Winter Term		Spring Term
PETERSHAM		CAMBRIDGE		PETERSHAM
1a	(Oct., Nov.)	Botany 8	(Dec., Jan.)	1c (Apr. to June)
2	“ “	Forestry 3b	(Dec. to Apr.)	7b “ “
3a	“ “	1b	(Feb., Mar.)	
		7a	“ “	
		9	“ “	

SECOND YEAR

Autumn Term		Winter Term		Spring Term
PETERSHAM		CAMBRIDGE		PETERSHAM
7c	(Oct., Nov.)	4	(Dec., Jan.)	6b (Apr.)
Thesis	“ “	Thesis (con.)	“ “	Seminar “
				LUMBER WOODS
		6a	(Dec. to Apr.)	6c (May to June)
		5	(Dec. and Jan.)	
		Zoölogy 7d	(Feb. and Mar.)	

DETAILED DESCRIPTION OF COURSES

FORESTRY

Courses Given at Petersham in the Harvard Forest

- 1a. Silviculture. *October and November.* Lectures, *two hours a week.* Field practice. Asst. Professor FISHER.

This course deals with the elements of silviculture as applied to the study, description, and treatment of wood crops. In lectures, field studies, and reports the following topics are taken up: factors governing forest growth and distribution; the silvics of local species; the principles of forest cuttings for improvement and reproduction.

- 1c. Silviculture. *April and May.* Lectures, *two hours a week.* Field practice. Asst. Professor JACK.

Course 1c deals with the theory and practice of propagating and planting the seedlings of forest trees for commercial purposes. Lectures and field work cover the following subjects: seeds, their collection, care, and germination; other modes of propagation; the formation and management of forest nurseries; commercial planting of seedlings or trees; planting plans. Spring work in the college nursery and in making plantations on open ground form the chief part of the field work.

2. Forest Measurements. *October, November, and part of April.* Lectures, *two hours a week.* Mr. ———.

The instruction in this course consists of lectures, field problems, and drafting room exercises. The following subjects are considered:—

Log scales— their use and the principles of their construction; practice in scaling; cordwood measurements.

Methods of obtaining the heights of standing trees; volume of felled trees; form factors. Principles and construction of volume tables.

Practice in estimating timber and mapping land; valuation surveys; construction of a timber map of a portion of the Harvard Forest.

Growth of single trees and of whole stands— stem analyses; construction and use of yield tables; location of permanent sample plots.

In April, during the sawing of the winter's cut of logs, the students study saw-mill practice for pine and hardwoods, and construct a mill scale.

Text-book: Graves's *Forest Mensuration.*

3a. Forest Botany. *October and November.* Lectures, *one hour a week.* Field practice. Asst. Professor JACK.

This course includes a study of the trees and shrubs growing in the Harvard Forest and adjacent region, so that the students may immediately become acquainted with the forest flora about them and the manner in which the different species are related to each other and their environment. Special attention will be given to their autumnal and winter aspects. Species regarded as forest weeds or of secondary importance must be studied so that the student may learn to discriminate between valuable species and those regarded as of small economic importance. The course will comprise lectures, laboratory and field exercises.

In April and May, upon the return of the class to the Harvard Forest after the winter in Cambridge, there will be examination and field reviews of the species studied in the autumn, particularly with reference to opening buds, vernalization, inflorescence, and other features characteristic of the trees in the spring season.

7b. Forest Management. *April to June.* Lectures, *three hours a week.* Field work and computations. Asst. Professor FISHER and Mr. ———.

Course 7b involves the application of principles considered in Courses 2 and 7a to the construction of a working plan, a main feature of which is the calculation of increment. A portion of the Harvard Forest is mapped, divided into compartments, measured, and the proper cutting is prescribed on the basis of ascertained growth, silvicultural condition, and the financial and practical considerations involved in management.

7c. Forest Management. *October and November.* Conferences and field practice. Asst. Professor FISHER and Mr. ———.

In this course the students, in conferences and daily field work with the instructors, take part in the laying out and execution of the fall and winter logging in the Harvard Forest. The cut to be made according to the working plan is located on the ground, the trees are marked, and the logging and hauling are planned. The men then work with the foreman and woods crew so as to become familiar with felling, sawing, yarding, etc. The business and mechanical aspects of the work, in addition to the silvicultural and technical, are brought out in frequent conference and discussion.

A thesis, dealing either with the work of the course or with some other phase of forest management, is required in connection with Forestry 7c.

Courses Given at Cambridge

- 1b. Silviculture. *February and March.* Lectures, *three hours a week.* Asst. Professor FISHER.

Course 1b is a continuation of Course 1a. It aims to give a broad view of silvicultural method as derived from European standards, with special reference to its adaptability to American conditions. The forest regions of the United States are considered in detail from the points of view of distribution, composition, and reproduction, and the logging methods employed in each are studied in their relation to silvicultural treatment and result. Forest influences in the different regions are also discussed. The course is conducted wholly by lectures, outside reading, and conference.

- 3b. Forest Botany. *December to April.* Lectures, *two hours a week.* Field and laboratory work. Asst. Professor JACK.

In this course the dendrological studies will include a review of the forest trees of North America, particular attention being given to those of special economic value and to those closely associated with them. It is not the intention or expectation that students shall learn to identify at sight a large proportion of the species considered, although they are expected to learn to know some of the more common kinds, and to recognize the genera to which plants composing the forest flora belong, whether of useful or so-called useless species.

While a general review will be given of the trees composing the forests of North America, and close examination given to all of economic importance, the species of the Eastern States may receive particular attention and be taken as types for study, the shrubs as well as the trees, since it is important to be able to differentiate between trees and shrubs when all are small. Their identification in summer and winter aspects will receive special consideration, and also their different stages of growth, identification by fruits, seeds, seedlings, etc.

This course of instruction will include, in addition to lectures, laboratory work and field exercises at the Arnold Arboretum and in natural woods.

4. Forest Protection. *December and January.* Lectures, *three hours a week.* Asst. Professor JACK.

In this course the various kinds of injuries to trees and forests will be considered, including those caused by fire. Besides the history of forest fires, the causes, and the damages arising from them under different conditions and in different regions, will be reviewed and methods of prevention or control fully examined.

The injuries from climatic and seasonal influences; from wind, floods, shifting sand; the effects of grazing by sheep and other domestic animals in the forests, and also injuries by wild animals, will be considered, with special reference to known methods of control.

The chief insects and also the fungi and other pests recognized as particularly injurious to American trees and forests will be considered from a practical or economic standpoint.

In addition to lectures there will be study of material and field exercises.

5. Forest Economics. *December and January.* Lectures, *three hours a week.* Mr. BAILEY.

The subjects considered in this course are as follows:—

History of forestry in the European nations, in India, and in America; development of silviculture and methods of management; comparison of the forest legislation and of the administrative systems of the several countries.

National forest policy—the development of the land laws of the United States and of Canada; the National Forests and the United States Forest Service; organization and administration.

State forest policy;—systems of taxation;—fire laws.

6a. Lumbering and Woods Practice. *December to April.* Lectures, *five hours a week.* Mr. ———.

The practical work of this course consists in the study of and report upon a single large typical lumber operation, usually in New Hampshire or Maine. For this purpose three weeks are set apart in January.

The lectures cover the following topics:—

The natural conditions which affect the management of lumbering operations, *e.g.*, climate, topography, and conditions of labor.

The effect of prices of lumber, ownership of stumpage, and previous operations in the country.

The lumber-producing regions of the United States; their characteristic conditions upon which methods of exploitation depend.

The lumber business and its six main branches: stumpage, its purchase and sale; logging, felling, yarding, etc.; transportation to the mill; the saw mill; transportation from the saw mill to the market; the market. After a consideration of the broad principles which govern the business each of the six branches will be considered in detail. Methods of logging, constructing and operating mills, and transportation will be studied carefully for each of the lumber-producing regions of the United States. Special emphasis will be placed on costs and organization.

The principles of Forestry in their relation to the lumber business. A careful study will be made of such principles as are applicable to lumbering conditions in the United States at present under various kinds of ownership of forest lands.

In connection with this course a number of special lectures will be given by representative men in the lumber business who will discuss methods and conditions in the field of their own experience.

7a. Forest Management. *February and March. Three hours a week.* Asst. Professor FISHER and Mr. ———.

This course consists wholly of lectures, reading, and problems. Its object is to present the principles of forest finance and of forest regulation based upon the subject of Forest Measurements (Course 2) and underlying the preparation of the working plan (Course 7b).

The subjects considered are as follows: growth in its relation to income; the several classes of rotation; the normal forest; the chief foreign methods of regulating the yield; the determination of the value of forests and of the financial results of forestry.

BOTANY 8. Wood Structure. — Microscopic Features. *December and January. Lectures, four hours a week. Laboratory work.* Professor JEFFREY, Mr. BAILEY, and an assistant.

This course deals with the structural characters of wood as the basis of identification, and the foundation upon which the principles of wood-utilization depend. The study includes microscopic examination of the commercial woods of the United States. Each student is given a collection of permanently mounted microscopic slides which he may retain for future reference. The laboratory is provided with a complete collection of hand specimens of American woods which are used in the study of the macroscopic structure. The lectures in the course are illustrated by a collection of lantern slides made from micro-photographs of American woods. Through the knowledge of the structure and growth of wood, the arrangement of elements, the conductivity of fluids, the storage of foods, the deposits of resin, oils, etc., gained in this course, it is expected that the student will understand the reasons for differences in strength of wood, odor, color, grain, pulping values, extractive values, decay, seasoning, warping, checking, defects, infiltration, etc.

9. Forest Products. *February and March. Lectures, three hours a week.* MR. BAILEY.

This course deals with the properties and utilization of commercial woods:—

The practical value and application of the knowledge of wood structure gained in Course 8; the properties and uses of wood, seasoning, kiln drying, decay, preservation, cooperage, and extraction of by-products.

The mechanical properties of wood, such as strength, compression, shearing, stiffness, hardness, toughness, etc.

The physical characters of wood,—color, grain, texture, odor, and resonance.

Normal and abnormal characters which are beneficial or harmful in timber, such as burls, birds-eyes, curly grain, shakiness, etc.

The chemical properties of wood; chemical composition of woody fibre; its use for various products, *e.g.*, cellulose, pulp, fuel, etc. Chemical deposits, such as resin, oils, etc., which are of value commercially.

The chief by-products of wood,—pulp, naval stores, tannin, products of distillation industries, etc.

Moisture in its relation to wood, — shrinking, seasoning, kiln drying, etc.

The preservation of wood and a study of the processes of decay. The attack of fungi and methods of preventing decay.

The methods of grading lumber. Study of the value and use of the most important commercial species. Price of the various species and grades. Various industries dependent on wood as a raw material. The substitutes for wood and possible uses for the less important species.

ZOOLOGY 7d². Forest Entomology. Lectures, laboratory work, and demonstrations. *February and March. Tu., Th., Sat., and a fourth hour to be arranged with the instructor.* The lectures and laboratory work at the Bussey Institution. Mr. BRUES.

This course is designed to supply the more necessary knowledge of practical entomology to those intending to enter forestry as a profession. It deals with the insects which injure and destroy forests as well as those which attack their finished products, and the student is acquainted with both the general and special methods of insect control. The more important species affecting forests are taken up individually to insure their ready recognition, and in connection with each species the most satisfactory means of control are considered, so that the student may be able to cope with the problems which arise in the rational conservation of forests through the depredations of insects.

Given at Corbin Park, N.H.

6b. Forest Surveying and Timber Estimating. Mr. ———.

Course 6b involves the application of the principles considered in Course 2 to the construction of forest maps and timber estimates of large areas of forest land. Methods of surveying and estimating forests will be considered both from the point of view of the ordinary lumbering and of the conservative management of lands under state and private control.

Given at the Harvard Engineering Camp by the Division of
Engineering

ENGINEERING 4a. Surveying. — Use of Instruments; Plane and Topographical Surveying; Levelling; Map Drawing and Field Practice. *Six weeks, beginning as early as possible in June.* Asst. Professor HUGHES and assistants.

Course 4a is open to students who have studied Plane Trigonometry.

This course comprises the study of the principles of surveying and the use and adjustment of instruments, with field practice. Beginning with approximate methods, the various kinds of surveys used in engineering work are made under supervision; the results are plotted in proper form on the map or plan, which is an essential part of every problem. The problems include paced, chain, tape, and stadia measurements; differential and profile levelling; land, road, and shore-line surveys with transit or compass and chain, tape, or stadia; plane-table, transit and stadia, and cross-section topographical surveys; adjustment of instruments; determination of position by astronomy; soundings and the use of the sextant; lettering and map drawing; the first principles of earth-work computation; the elements of simple curves.

Text-book: To be announced.

For full information regarding this and other courses given at Squam Lake, N. H., see the descriptive pamphlet of the Division of Engineering.

ADVICE TO INTENDING STUDENTS OF FORESTRY

To students in Harvard College who intend after graduation to pursue professional courses in Forestry, the Division recommends the following subjects of study, which, though not as a whole indispensable, constitute a highly desirable foundation for technical forestry: —

FIRST YEAR	SECOND YEAR	THIRD YEAR
Engineering 1e (<i>1st half</i>)	Engineering 1d Engineering 1e	Engineering 4e, 5b, 5c
Botany 1	(<i>2d half</i>)	Botany 3a, 3b
Geology A, B, 4, 5	Botany 2	Geology 1, 16
Physics 1 or C	Zoölogy 1, 2	Economics 1
English A	Chemistry 1	Land. Arch. 1
	Geology 6	$\frac{1}{2}$ course elective
	German <i>or</i> French	
	Engineering 3a	
	Engineering 4a, in Summer.	

Students contemplating the study of Forestry are urged to seek the advice of the Division that they may choose their courses with the best reference to their needs.

GENERAL INFORMATION

THE ARNOLD ARBORETUM

Professor CHARLES S. SARGENT, *Director*

The Arnold Arboretum, which includes about 220 acres of land, offers opportunities for the field study of a large variety of hardy American and foreign trees and shrubs which do not occur in the Harvard Forest. They are mainly arranged in botanical groups and are available for study at all times of the year.

In addition to the general collections of hardy species, the nurseries contain many species under test for hardiness or other qualities which would render them economically valuable for cultivation in this country, either horticulturally or silviculturally. Besides the general living collection of woody species, the Arboretum has open to general view a collection of American woods; and it possesses an herbarium of ligneous plants and a dendrological library which are unexcelled in this country. The herbarium and library are open to students pursuing special work or investigations.

The Arnold Arboretum is located on the southerly side of Boston (Post Office address, Jamaica Plain). It is near the Forest Hills station of the N. Y., N. H. & H. R. R., and may be reached by taking Boston Elevated cars to the same point.

THE HARVARD FOREST

The Harvard Forest forms an important part of the equipment of the Division of Forestry. It was acquired in the autumn of 1907 through the generosity of Mr. John S. Ames, of North Easton, Mass., of the Class of 1901, who gave the money necessary for its purchase and an additional sum for the repair and outfitting of buildings. The land is situated in Petersham, Mass., and about 1800 acres of it were previously owned by Mr. James W. Brooks. In order to perpetuate the forest and render it useful both to the town and the cause of forestry, Mr. Brooks offered it to the University for a price substantially below its estimated sale value. At

the same time owners of adjoining land, Messrs. J. J. Higginson, Edwin C. Dexter, Joseph C. Smith, Henry S. Bennett, Charles S. Waldo, and William Simes, and Mr. Brooks himself, offered to give contiguous lots and holdings amounting to between 200 and 300 acres. These gifts simplified the boundaries, secured the approaches, and rounded out the area of a demonstration-forest of about 2000 acres.

The forest lies on hilly country at an elevation varying from 800 to 1400 feet above sea level. It is divided into three distinct blocks of (about) 850, 550, and 600 acres, which are located, respectively, northeast, northwest, and southeast of the village. The northeast block covers the slopes and surrounding areas of Prospect Hill, the northwest block includes the basin of a small pond called Meadow Water, and the southeast block takes in about two miles of the narrow valley of the Swift River, with a pond and small water power along its course. The total stand of merchantable timber in the forest amounts to ten million board feet, nine tenths of it white pine, and the rest chestnut, red and white oak and other hard woods. About fifteen miles of good wood road provide access to almost any portion of the tract.

In managing the forest the policy is to carry on regular logging operations and other woods work looking toward the most productive handling of the forest, and in connection therewith to teach the elements and principles of technical forestry. Thus, the function of the whole tract, from the point of view of the professional student, might be compared to that of the hospital in medical study or of the mine in mining engineering: a working example on a liberal scale of the business in which the forester expects employment, accompanied by abundant chance for the study of the finer and more theoretic points of the science. To this main purpose the actual condition of the forest is strikingly well adapted. This is due in part to the fact that most of the timber can be very cheaply handled and commands a ready sale. But even more favorable is the unusually fortunate arrangement of the age-groups or different generations of timber. It so happens that stands of varying ages, from the small sapling to the mature tree, are almost equally represented on separate areas, so that an approach to a continuous yield can be secured in a short time. The Working Plan for the forest provides for the regular cutting of as much timber as the annual

growth on the whole tract and the amount of growing stock on hand make expedient. The operations are entirely carried out by the Forest School, which maintains the nucleus of a permanent and experienced woods crew, with whom the students work during a part of the logging season. The cut is planned, located, and begun in the autumn, finished during the winter, and sawed in the spring. Thus each class follows one complete operation from the stump to the market, seeing it not only in its relation to silviculture and forest management but also to its practical execution and financial control.

Incidental to the main enterprise are improvement cuttings by which younger portions of the forest are gradually brought into good growing condition, and the plantation of commercial species, either upon blank or poorly stocked land or where reproduction cannot be easily secured by natural means. For the latter purpose, as well as for instruction, the School keeps a forest nursery, in which are raised both species to be grown commonly on the tract and others for experimental purposes.

EQUIPMENT AT PETERSHAM

The headquarters of the Division of Forestry at Petersham consist of a large three-story building, the two upper floors of which are divided into bedrooms, and the lower floor of which includes a dining room, two lecture rooms, a library, a living room, and an instrument closet. Adjoining the main house is a wing, and behind this are two barns for horses and cattle, and a storage shed for wagons, sleds, etc. The outfit for work includes all the instruments commonly used in forestry, a complete set of logging and woods tools, and such reference books as are needed in connection with the instruction given. The lecture rooms and library are furnished with work-tables, chairs, and bookcases. In each bedroom is an iron cot, a table, two chairs, two pails, and a lantern. There is a bath-room with running water on the second floor. A telephone provides communication with the village and with points on long-distance lines.

LIVING ARRANGEMENTS

The living arrangements are similar to those in a good engineers' camp. Each man is expected to supply his own bedding and look after his own room. Board is furnished at a reasonable rate. A small charge per month (see below) is made to cover rent, the use of furniture, light, and heat. Plain accommodations are offered not merely because they are suitable for the conditions of work, but for the sake of keeping the cost of living below what it would be in Cambridge. In this way the slight extra expense involved in transferring residence during the academic year is neutralized. During the winter term, the only one spent at Cambridge, lodgings can be got at reasonable rates in private houses near the College. The Harvard Dining Association and the Randall Hall Association provide board at cost. Although membership in these dates from the beginning of the academic year, it is usually possible to join in December, when the students of forestry return to Cambridge.

FEES AND EXPENSES

The tuition fee for students of forestry is \$150 a year. Board and lodging at the Division headquarters in Petersham will average \$5.50 a week. Besides these the only additional expenses (not counting personal items) are the fees for use of instruments, amounting to \$5 a year, and the two woods trips during the second year of the programme, the combined cost of which comes to about \$75. The table below gives the annual expenses connected with field work and instruction, only living expenses for the winter term at Cambridge, which will vary with the individual, being omitted:—

Tuition	\$150.00
Room rent (charged upon the term-bills) 4 months	
@ \$2.00	8.00
Board, 16 weeks @ \$5.00	80.00
Instrument fees, etc	10.00
Railway fares between Cambridge and Petersham .	7.00
Woods trips (second year only)	75.00
	<hr/>
	\$330.00

PAYMENT OF THE TUITION-FEE

Each student liable for full tuition is required to pay three fifths of the tuition-fee to the Bursar punctually at the beginning of the academic year without the presentation of a bill.

Every student in the Graduate School of Applied Science whose work for the whole academic year is to amount to two full courses or more, is required to pay to the Bursar on or before September 29, 1910, \$90, — without the presentation of a bill.

Every Graduate Student whose work for the whole academic year is to be *less* than two full courses is required to pay on or before September 29, 1910, **his entire fee for the year**, — without the presentation of a bill.

The first term-bill is issued January 20, and must be paid on or before February 10. This bill includes, in addition to the second instalment of the tuition-fee and half the year's charges for the use of a room at the headquarters building in Petersham, such charges as the following: fees for laboratory courses which begin in the first half-year; Stillman Infirmary fee; locker fees; such incidental charges as can then be determined; charges for gas, and for board at the Harvard Dining Association and the Randall Hall Association, made up to as late a date as practicable.

BONDS

Every student in Harvard College in regular standing must file with the Bursar a bond in the sum of *four hundred dollars*, signed by two bondsmen, one of whom must be a citizen of the United States, or by a surety company duly qualified to do business in Massachusetts, as security for the payment of College bills; or he may deposit with the Bursar four hundred dollars in United States bonds for the same purpose; or he may deposit *fifty dollars* as security and pay in advance all sums for which he becomes liable to the University. Money deposited as security is returnable after the issue of the second term-bill, one week before Commencement.

The same rule applies to every Special Student in Harvard College and every Resident Student in the Graduate Schools; except that *two hundred dollars* is the amount of the bond required of a student of one of these classes, unless he occupies a College room or boards at Memorial Hall or Randall Hall.

Every student in any department of the University who occupies a College room or boards at Memorial Hall or Randall Hall must file a bond for *four hundred dollars*, or must in advance, and in addition to his tuition-fees, pay the full year's rent of his room, and make a deposit as security for the payment of his board at the rate of *six dollars a week in the case of Memorial and five dollars in the case of Randall Hall*.

No officer or student of the University is accepted as a bondsman.

Students of Forestry who wish to come direct to Petersham from their homes may arrange the payment of the first instalment of the tuition-fee and the filing of a bond with the Bursar by mail. The Bursar's address is Dane Hall, Cambridge, Mass.

USE OF INSTRUMENTS

Students of Forestry are required to pay a fee to cover the ordinary wear on instruments used in the following courses: Forestry 2, 7b, 6a, 6c. This fee is \$2.50 for each course. Each student is also liable for the costs on instruments lost or broken while charged to him; and as security for payment he must deposit at the beginning of the year, with the Chairman of the Division of Forestry, the sum of \$5.00. At the end of the year this deposit, less whatever drafts have had to be made upon it, is returned to the depositor.

A laboratory fee of \$5 is charged in Zoölogy 7d, and a small fee, as yet undetermined, will be charged for the use of laboratory material in Botany 8.

PERSONAL OUTFIT

For personal outfit at Petersham each student will need a pair of heavy camp blankets (or ordinary blankets supplemented by a cheap comforter), a belt axe or hatchet, a pocket compass, and a pocket magnifying glass. Every man is expected to have a bicycle, which is convenient at all times and essential in getting to and from the more distant parts of the forest. Sufficiently good second-hand wheels can usually be bought for from \$6 to \$12. As for wearing apparel, the essentials are hobnailed boots, flannel shirts, and whatever rough outside clothes the individual prefers. A slicker or poncho will be found useful. Note-books, stationery, drawing materials, etc., needed in the work of the courses can be purchased at the School building.

HOW TO REACH PETERSHAM

Petersham is situated in northern Worcester County, Massachusetts. Athol, on the Fitchburg Division of the Boston and Maine, is the nearest point to the Harvard headquarters. Stage and express teams carry passengers and baggage from Athol to Petersham at reasonable rates.

REGISTRATION

Students of Forestry are expected to register at the headquarters of the Division of Forestry in Petersham on Thursday, September 29, the first day of the academic year. In order that necessary arrangements may be made, it is desirable that students intending to register should notify the Chairman of the Division at least two weeks before the opening of the University.