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PENNSYLVANIA DEPARTMENT OF  
FORESTRY

PENNSYLVANIA STATE FOREST  
ACADEMY

MONT ALTO, FRANKLIN COUNTY, PA.

TWENTIETH YEAR—1922-1923

Apr 22-7-28

BULLETIN 25

APRIL, 1922

GIFFORD PINCHOT, Commissioner





PENNSYLVANIA DEPARTMENT OF  
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# PENNSYLVANIA DEPARTMENT OF FORESTRY

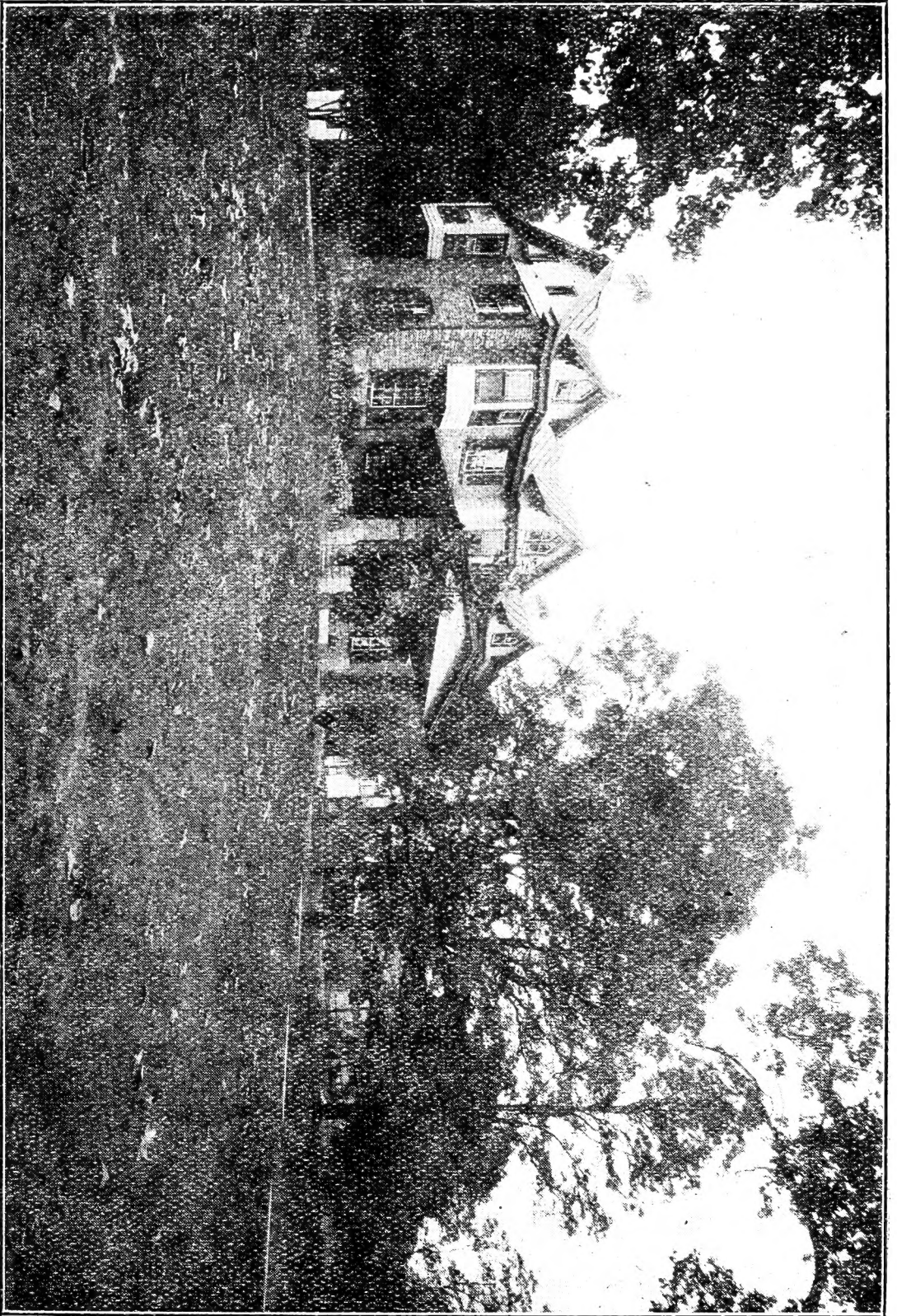
## STATE FOREST COMMISSION

GIFFORD PINCHOT,  
EDWARD BAILEY  
HENRY W. SHOEMAKER  
MARY FLINN LAWRENCE (Mrs. John W.)

GIFFORD PINCHOT, Commissioner of Forestry.  
ROBERT Y. STUART, Deputy Commissioner of Forestry







Weisting Hall. The Faculty Cottage and the Dormitory Are at the  
Extreme Right

## FOREWORD.

The Pennsylvania Department of Forestry has undertaken the huge task of restoring the forests of the State to their original productive condition. Penn's Woods formerly yielded abundant revenue to the owners, steady work for the wage earners, and healthful living conditions to all. Cheap lumber, pure water supply, stream regulations, and the prevention of erosion are among the benefits the forest brings.

To develop the forest land purchased by the State, trained foresters were needed, and as no institution in the State could or would furnish them, the State Forest Academy was organized twenty years ago to meet the emergency. The State now holds almost a million and a quarter acres of forest land and should acquire five million more.

This announcement for the 20th year is made to the people of Pennsylvania to inform them of the progress and standing of the Academy and to bespeak their hearty cooperation in the restoration of the forests of the State. It is not an extravagant claim to say that the safety and prosperity of the entire State hinge on the success or failure of this movement.

## THE FACULTY.

- Edwin Allen Ziegler, A. M.  
Director and Professor of Forestry.
- Willard M. Drake, A. B., M. S. F.  
Professor of Forestry.
- George S. Perry, B. F.  
Professor of Forestry.
- Coleman J. Harris, A. M., M. S.  
Professor of Biology.
- Roland W. Brown, B. S.  
Professor of Soils and Chemistry.
- W. Harold Horning, B. F.  
Assistant Professor of Forestry.
- Louis C. Loetzer, B. F.  
Instructor in Forestry.
- 

## SPECIAL LECTURES.

Special courses such as fish and game, and first aid will be given by special lecturers.

In addition an opportunity is given the students to hear special lectures on forestry, botanical and other subjects. Among these special lecturers will be:

- Hon. Gifford Pinchot, Commissioner of Forestry.  
Dr. John W. Harshberger, University of Pennsylvania.  
Dr. O. E. Jennings, University of Pittsburgh.  
Mr. R. S. Kellog, Secretary, American Newsprint Association.  
Mr. John Foley, Forester, Pennsylvania Railroad.  
Colonel Henry W. Shoemaker, Pennsylvania State Forest Commissioner.  
Mr. J. S. Illick, Pennsylvania Department of Forestry.  
Specialists from U. S. Forest Service, and Pennsylvania Forest Service.



## SCHOOL CALENDAR, 1922-1923.

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January 3, 1922.....	Christmas vacation ends.
January 17-21, 1922.....	First term examinations.
Jan. 23, 1922.....	Second term begins.
February 22, 1922.....	Washington's Birthday.
May 30, 1922.....	Memorial Day.
June 12-17, 1922.....	Second term examinations.
June 22-23, 1922.....	Competitive Scholarship Examinations.
June 19, 1922.....	Summer session begins.
July 4, 1922.....	Independence Day.
August 3, 1922.....	Commencement Exercises.
August 4, 1922.....	Summer session ends.
September 5, 1922.....	Fall term begins.
November 30, 1922.....	Thanksgiving Day.
December 15, 1922.....	Christmas vacation begins.
January 2, 1923.....	Christmas vacation ends.
January 15-20, 1923.....	First term examinations.
January 22, 1923.....	Second term begins.
February 22, 1923.....	Washington's Birthday.
May 30, 1923.....	Memorial Day.
June 11-16, 1923.....	Second term examinations.
June 21-22, 1923.....	Competitive scholarship examinations.
June 18, 1923.....	Summer session begins.
July 4, 1923.....	Independence Day.
August 2, 1923.....	Summer session ends.
September 4, 1923.....	Fall term begins.

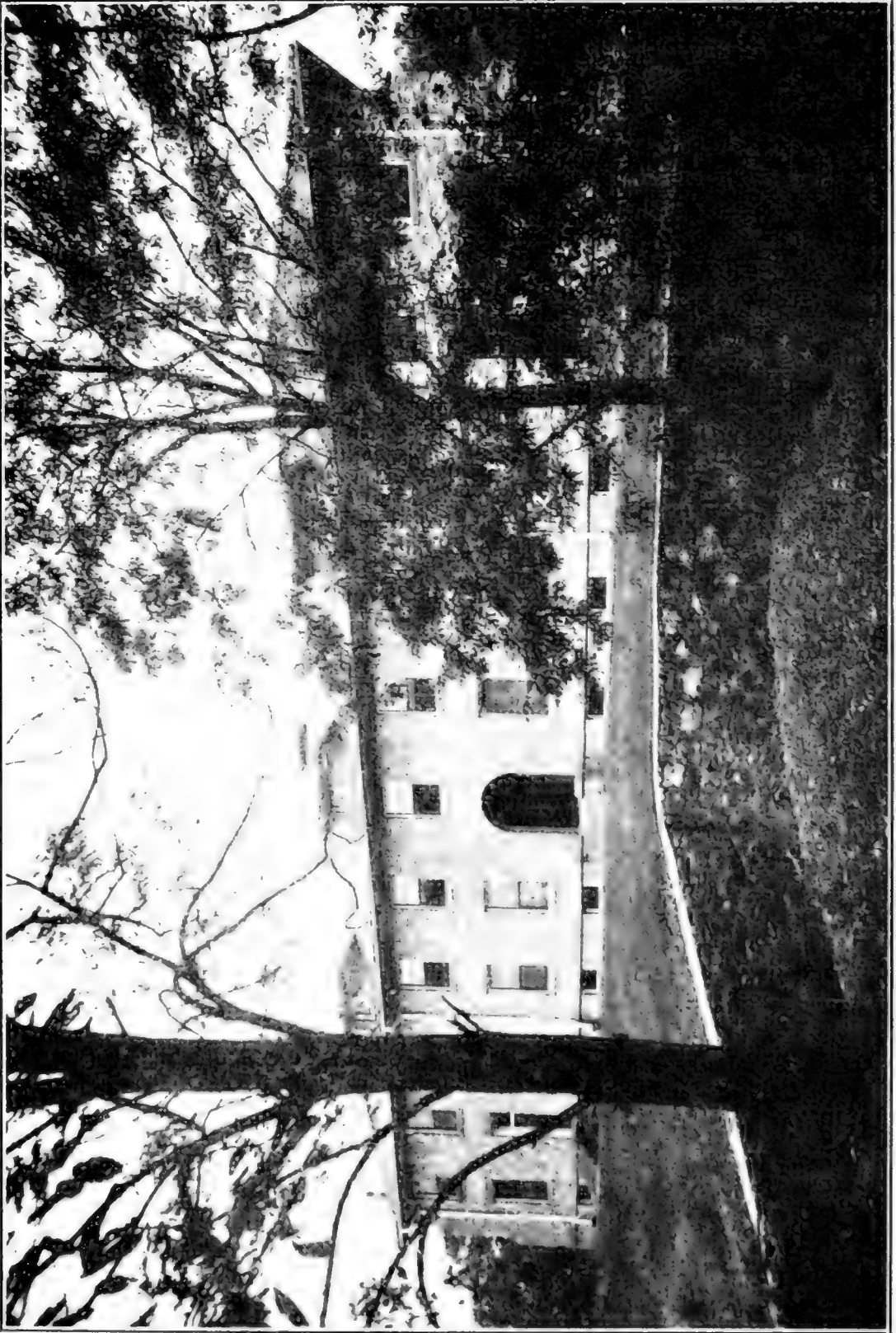
## ORIGIN AND EARLY HISTORY.

As early as 1876, in an address before the recently organized American Forestry Association at Philadelphia, Burnett Landreth pointed out the necessity of teaching forestry as a science in itself and not as a branch of agriculture. From that time, throughout the period of agitation and public education which preceded the foundation of the Department of Forestry there continued frequent references to the necessity of such a separate course, or, better still, of a separate school devoted to the teaching of forestry. The European Forest Schools were considered as models, but all recognized the necessity of adapting such a school to American needs and conditions. This agitation was especially strong in the years of 1888 and 1889. During 1889 the trustees of the University of Pennsylvania established a Chair of forestry to be filled as soon as funds became available, but the Chair was never filled.

Because of the slow growth of public sentiment in favor of Forestry, particularly among forest owners, no constructive steps were taken towards the establishment of a technical forestry course until about the year 1900. In issues of "Forest Leaves," in 1901 and 1902, are found several articles dwelling on the necessity of trained men to do forestry work upon the large areas of land which were rapidly passing into the control of the Department of Forestry. Dr. J. T. Rothrock, then Commissioner of Forestry, took the lead in this movement. Endeavors were made to have scientific courses in forestry added to the University of Pennsylvania or to Pennsylvania State College. These schools refused at that time to undertake the work. Appreciating the actual need of men and realizing the great advantages of a practical school connected with actual forest work, Dr. Rothrock decided to establish such a school under the control of the Department of Forestry and locate it upon a State Forest.

In the spring of 1902, Geo. H. Wirt, a Biltmore graduate, was sent to Mont Alto to take charge of the property recently purchased from the Mont Alto Iron Co., and to establish a forest nursery. Although the legislature of 1901 had refused to adopt Dr. Rothrock's plans, he felt sure that two years would find a change in sentiment, and, as a preliminary measure four men were sent to help Mr. Wirt and get some instruction in forestry. In January, 1903, Paul E. Arnold, a German forester, and graduate of the famous Tharandt Forest Academy in Saxony, was added to the teaching force. By act of May 13, 1903, the school was formally established and plans were made for the entrance of the first class. The Forestry Reservation Commission had, however, previously adopted, on June 4, 1902, a curriculum and plan of work submitted by Mr. Wirt for the forest school then in his charge.

The original idea was that the students admitted should be composed of young men from the wooded districts with practical woods experience, and the first class was partly composed of such men. It was soon recognized that these men were often unable to do the mental work required in a study of scientific forestry and the entrance requirements were made strictly competitive with both physique and mental ability entering into the test. This plan was adhered to up to 1920, when non-scholarship students were admitted on proof of standard college entrance preparation.



The Forest Academy Dormitory



At first there was some thought of moving the school to the Caledonia purchase as possessing better facilities, but this was finally given up and the administrative buildings of the old furnace at Mont Alto were utilized for the school. These were far from being ideal, and consequently the school was materially handicapped until 1908, when ground was broken for the first of the present group of modern buildings.

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## LOCATION.

The Pennsylvania State Forest Academy is located about one mile from Mont Alto, a village in Franklin County, which is sixty miles southwest of Harrisburg on the Cumberland Valley Division P. R. R. The ground occupied by the school buildings is a part of the Mont Alto State Forest, which affords an opportunity for practical instruction and experimentation equalled by few, if any, American forest schools. One of the foremost forestry educators of the United States called the Pennsylvania State Forest Academy, because of its excellent location, "the gem of American forest schools". The situation is healthful and the school is supplied with water from a spring located in the interior of the 23,000 acre forest. To the west of the school lies the Cumberland Valley which is regarded as one of the garden spots of Pennsylvania, and nearby are some of the most scientifically managed apple and peach orchards of the State.

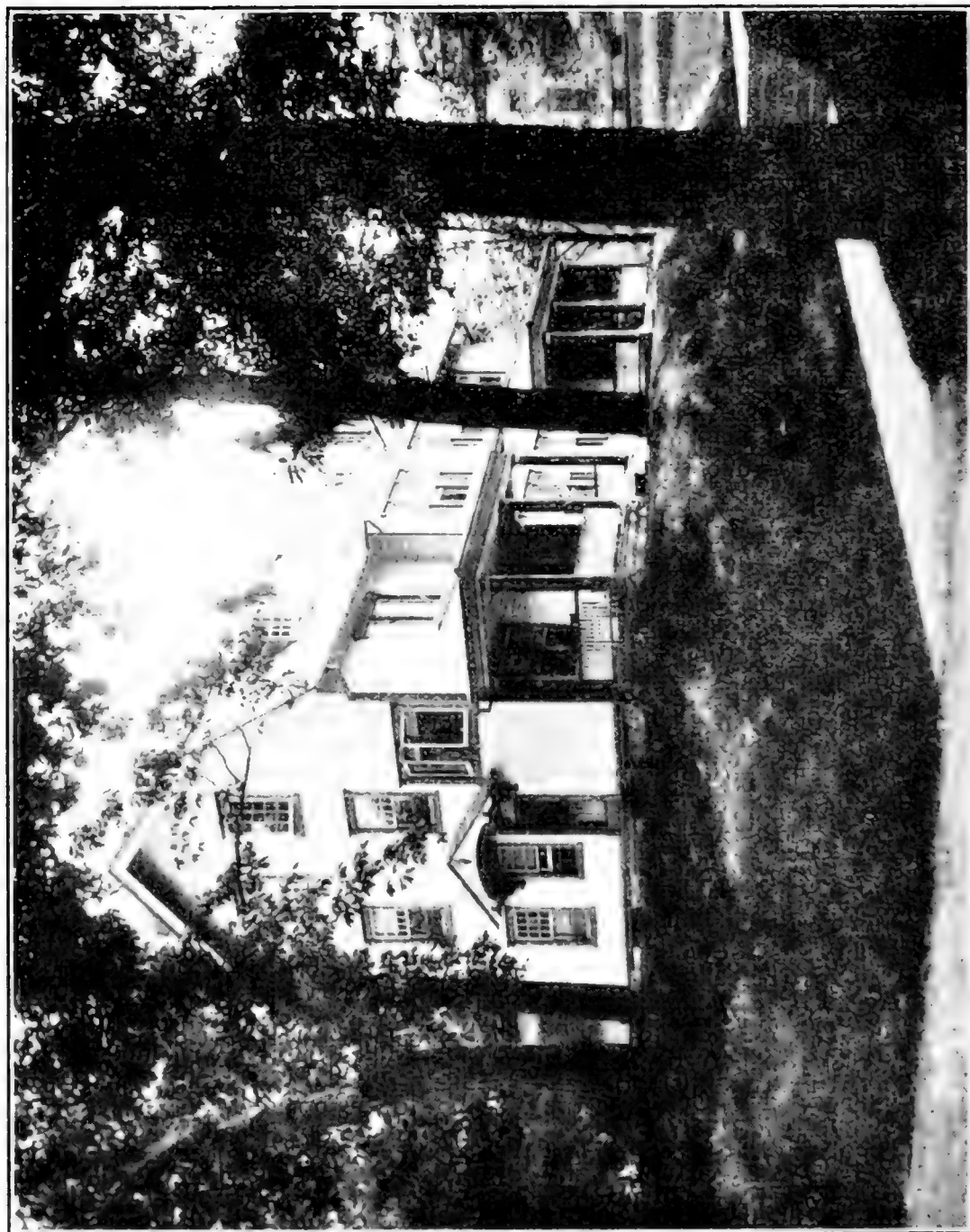
The forest location of the school stands in strong contrast with those in larger cities and college towns. Such a situation has advantages which make it not only attractive but also convenient for the study and practice of forestry in the forest throughout the year. It enables the student to study forestry rather than about forestry.

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## BUILDINGS.

Thirteen buildings comprise the Academy group. Weistling Hall the oldest of the buildings, is a large three story structure and was formerly the residence of Col. George B. Wiestling, a member of the first Forestry Commission of Pennsylvania. This building has recently been remodeled and is now used as an administration building. It also contains the dining room, kitchen, and quarters for the matron and servants.

The Main Building was erected in 1908-09. It is the largest building of the group and constructed of a very attractive native quartzite. On the second floor of this building are comfortable living rooms for all the students. The first floor is devoted to class rooms, laboratories, and the library. In the basement are a recreation room, a wood specimen room, and a furnace room. The building is supplied with steam heat, illuminated with electricity, and furnished with necessary toilet rooms and lavatories.



The Faculty Cottage.

A double cottage, occupied by the Director and another member of the faculty, was built in 1911. Three other single cottages are occupied by instructors or are available for their use. Other buildings, such as machine shop, log lodge, gymnasium, sawmill, wagon shed, stable, and seed storage house dot the campus.

## CAMPUS

A spacious and attractive campus surrounds the school buildings. Upon it are many native and exotic trees and shrubs. The most distinctive and impressive features of the campus are the massive Black and White Oak trees which are remnants of the original forest and bear mute evidence of many vicissitudes during an existence of more than two centuries. Amidst these stately trees are carefully laid out drives and walks, and a meandering brook of pure mountain water. Overlooking all this picturesqueness is the productive and carefully managed Mont Alto State Forest.

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## FACILITIES FOR INSTRUCTION.

The facilities at Mont Alto for instruction in forestry compare favorably with any in America. The laboratory equipment is modern and complete. The school forest, nursery, and arboretum are easily accessible and afford object lessons which cover a wide range of forestry problems. The proximity of the school to its out-door working field economizes much time which would otherwise be spent on the road.

The biological, chemical, and soil laboratories are adequately equipped with modern appliances and fully stocked with necessary working material.

Numerous collections have been prepared and are available for demonstrating lectures, laboratory work, and special investigations. A herbarium of more than 4,000 specimens of native and exotic woody and herbaceous plants is carefully classified and available for study purposes. A collection of forest tree fruits, seeds, and seedlings is in progress. Typical specimens of wood destroying and parasitic tree fungi are on exhibition in a small museum. Many species of forest insects have been collected and specimens of their work are available for study and demonstration purposes.

In the basement of the main building is a room 16 x 60 feet containing a collection of all the important commercial woods of the United State and some foreign woods. These woods are used in the course in Wood Identification.

A collection of tools, instruments, and machines used in lumbering, silvicultural operations, protective work, and mensuration exercises is in progress. It contains planting hammers, fire torches, fire rakes, brush hooks and other implements designed by Pennsylvania and other American foresters. It also embraces representative European instruments.

The school is adequately equipped with the best and most practical instruments required in the practice of forestry. The surveying equip-





Students Identifying Trees.



Counting and Bundling Seedlings in the Forest Academy Nursery.



An Exercise in Forest Mensuration.

ment is complete and up to date. The forest mensuration equipment comprises the best types of American and representative European calipers, hypsometers, increment borers, xylometers, chains, tapes, and other necessary instruments.

The library comprises all the standard texts on forestry in the English language and many publications in foreign tongues. All the principal forestry periodicals and representative lumber, trade, and technical journals are received regularly and filed systematically for future references.

A large collection of carefully selected charts and photographs covering all phases of forestal activities, is available for use and furnishes the best kind of illustrative material for class work. Lantern slides, covering the major forest operations and typical forest conditions are in stock and are used to illustrate classwork.

For field work in forestry the vicinity of Mont Alto offers unsurpassed facilities. The latitude and topography favor a rich flora. It is the meeting ground of northern and southern species. The northern follow the mountains towards the South and the southern extend northward through the valleys. Within one mile of the school buildings occur more than 100 species of native woody plants and many introduced species. The richness of the local woody and herbaceous flora and its proximity to the school make it possible and practical to give the major part of the instruction in Tree Identification and Systematic Botany in the forest and nearby field without spending an excessive amount of time on the road.

A five-minutes walk from the school brings one to a forest nursery with an annual capacity of 2,000,000 seedlings. It is well equipped with modern nursery appliances, and in it the students learn, not by general observation but by actual work, nursery practice from the preparation and sowing of seed beds to the packing and shipping of seedlings and transplants.

The Mont Alto State Forest has been under careful and business-like management for the past seventeen years. It is dotted with plantations, experimental sample plots, improvement cuttings, fire towers, and ranger stations, ramified by roads and trails, covered with fire, compartment, and telephone lines, and partly divided into blocks, compartments, and stands. The plantations contain many different species of trees ranging in age from 1 to 19 years and cover an aggregate area of over 600 acres. Improvement cuttings have been made annually since the creation of the forest. A study of the effect of light, medium, and heavy thinnings has been in progress for five years. One steel and two wooden towers have been erected at commanding lookout points. They and the ranger's houses are connected with the forester's headquarters by a state owned metallic circuit telephone system, whose aggregate length is more than 26 miles.

The utilization operations are among the most interesting and instructive on the forest. Fuelwood, posts, and poles are harvested on a large scale. A state-owned portable sawmill, stave mill, shingle mill, and lath mill are operated on the forest. The students, as a part of their course in Lumbering work upon these mills and learn to handle the different positions from felling the trees and firing the boiler to head sawer and timber scaler. Briefly, the students are kept in constant contact with all the operations of a forest business, and are taught the best and most efficient methods of handling a forest property both by precept and practice.

## SPECIAL LECTURES.

The faculty arranges annually a course of free lectures. These instructive and helpful talks are given to the students by men of prominence in subjects allied to forestry. They cover travel, history, civics, literature, first aid, wood craft, personal health, and other timely topics.

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## PURPOSE.

The purpose of the Pennsylvania State Forest Academy is to prepare thoroughly trained foresters for the service of the State in its forests. The duties of a forester in the employ of the State require a thorough training and apprenticeship in actual woods work, besides the usual school studies in forestry, the sciences, and a number of cultural subjects. The forester must have an equipment covering the surveying and mapping of his forest; the growing of trees and their proper management from planting, through thinning, to final logging and sawing; the protection of the forest from its arch-enemy, the forest fire, as well as from insects, disease, and trespass; the building and improvement of the forest roads, trails, fire lines, telephone lines, and the fire towers; the estimation of timber and the calculation of its growth, value, and financial returns; the directing of labor; the keeping of records and accounts; and some knowledge of business and forest law. This requires an underlying training in mathematics, botany, zoology, chemistry, physics, geology, and soils, as well as history, language and economics.

The practical application of this training is the large feature of the school, for the entire course may be said to be given in the 70,000 acres of the Mont Alto and Michaux State Forests in which the school is located. All the activities of the forester are followed in the woods from the growing of trees from seed in the nursery, to the grinding of the forest student's own axe, the cutting of undesirable trees into cordwood, and the mature trees into saw-logs, as well as their manufacture into lumber, lath, staves, and shingles on the school mills; from the day and night fighting of forest fires and the pick and shovel building of roads to the preparation of a thorough working plan for a specified tract of forest land.

But beyond all this technical training, the school aims to develop men who love the forest, for a successful forester must look upon the forest as more than a mere clump or collection of trees. He must see in it a complex community or society of living things and be on a speaking acquaintance with them all. He should know the wild animals, birds, plants, and rocks so well that he finds interest in them. A good forester should not be lonesome in the forest, but instead find continuous contentment in his extensive out-door laboratory.

Last, but not least, the school aims to graduate men who love the people of the forest, if not for what they are, at least for what he hopes they will become. A forester must be a man of parts with whom the people of the forest communities are glad to associate, willing to do ordinary business on a reliable basis, and discuss everyday problems with interest and benefit.



## ADMINISTRATION.

The control of the school is vested by legislative enactment in the Commissioner of Forestry. The pedagogical supervision and immediate government is delegated to a Director and school faculty.

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## FACILITIES FOR RECREATION.

The student body maintains an athletic association. Athletic contests are not engaged in so extensively as at some other educational institutions because the students obtain sufficient physical exercise in their field work which takes them out of doors at frequent intervals during the entire year. A baseball diamond, a double tennis court, a billiard table, and gymnastic equipment are available for use.

Basket-ball is the most popular game. It is especially adapted to a small student body and engaged in during the winter when field trips and forest exercises are few in number and of short duration. The schedule comprises games with normal schools and small colleges.

Hunting and fishing are among the most popular sports. The Mont Alto and Michaux State Forests of 70,000 acres and adjoining forest properties and abandoned fields afford excellent and convenient hunting grounds. Within the forest is a game refuge of 2,000 acres in which wild animals and game birds are propagated systematically. Deer, opossums, raccoons, wood chucks, squirrels, rabbits, pheasants, and quail are plentiful, and wild turkeys and foxes, are occasionally seen. It is not unusual to see a herd of fifteen deer, and occasionally a herd of 25 and in one instance 31 have been observed. In spring time troutfishing offers an enjoyable form of recreation. The nearby mountain streams are numerous and well stocked.

Many points of historic interest are the objectives of week-end walking trips. Among these may be mentioned the Gettysburg and Antietam battlefields, President Buchanan's birthplace, and Pen Mar, a summer resort located on a high mountain at a point crossed by the Mason and Dixon line. Walks to local high points and commanding lookout towers are frequently scheduled. On the Mont Alto forest are one steel and two wooden towers 50 feet in height, affording excellent views of the extensive timbered mountain slopes and the fertile Cumberland Valley, which is surpassed in Pennsylvania only by the Lancaster Valley in its agricultural capacity.

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## FOREST CLUB.

The Rothrock Forest Club is a student organization named in honor of Dr. J. T. Rothrock, the founder of the school and for many years the leader of the forestry movement in Pennsylvania, and in the United States. The meetings are held in Log Lodge, a commodious log building finished in southern yellow pine and heated by a spacious fire-place. The program of the meetings is similar to that of literary societies at other educational institutions. The club is also the agency through which the students are introduced to prominent men in forestry and other professions.

## SCHOOL YEAR.

The school year is divided into the first and second terms and the summer session. The first term begins on the first Tuesday of September and extends to the latter part of January. The second term begins the last week in January and extends to the middle of June. The summer session begins immediately upon the termination of the second term and extends to the early part of August, when a four weeks recess begins.

A two weeks recess during the Christmas Holidays is provided each year. Four weeks in April and May are devoted entirely to planting and nursery work. The school year thus covers 46 weeks. This is a considerably heavier course than is given in any other four-year forestry school in the United States.

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## REQUIREMENTS FOR ADMISSION.

The general requirements for entrance to this school are as follows:

1. Applicants for admission to the Freshman class must be at least 17 years of age and must submit to the Director of the School proper testimonials of a good moral character.
2. Every applicant for admission shall have completed a 4 year High School course or satisfactory equivalent.
3. Students desiring to enter with advanced standing must present properly signed certificates from other colleges covering the subjects pursued at such institutions.
4. Students must enter at the beginning of the fall term and not later than September 19, 1922, unless they have advanced standing to cover the work done by the classes they wish to enter.

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## SPECIFIC SCHOLARSHIP REQUIREMENTS:

The scholarship required of all applicants for entrance to the Freshman class is evidence of thorough preparation in fifteen units of High School work or its equivalent. A unit of High School work is the amount of work represented by five recitations a week for a school year of at least eight months or a minimum of 160 hours of recitation work or equivalent laboratory work.

The required units for entrance to the Freshman class are as follows:

English .....	3 Units
Mathematics (Elem. Algebra, Plane Geometry Advanced Algebra, Solid Geometry .....	3 Units
Science (Botany, Physics, Chemistry, Physical Geography; etc.) .....	1 Unit
History .....	1 Unit

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8

The elective units to make up a total of 15 should be selected from the following subjects:

- English
- Language, other than English
- Mathematics.
- History.
- Science.
- Civics.
- Vocational Subjects.

The number of units to be allowed will be determined by the Director of the Academy. If students do not maintain the scholarship standards of the school, they will be dropped.

#### **Application Forms:**

Each applicant is required to submit a properly executed application for admission. Application form may be obtained from the Director, State Forest Academy, Mont Alto, Franklin County, Pa.

#### **State Scholarships:**

The State Department of Forestry offers not to exceed ten four-year scholarships annually. The candidates for these scholarships must be "Citizens of Pennsylvania, not less than 17 or more than 25 years of age on the first day of September of the year of entrance, must be physically sound as shown by physical examination and must take a mental examination in Scholarship which covers the following branches: English (Grammar, Composition and Rhetoric); United States History; Civil Government; Arithmetic with special emphasis on Mensuration, Interest, Proportion, and Progression; Algebra (complete High School Algebra); Plane Geometry, and Biology (including Human Physiology)".

The examinations for 1922 will be held on June 22 and 23 at Harrisburg. Candidates will report at the Department of Forestry, Capitol Building, 9 to 12 A. M. June 22.

The mental examination will begin at 1:30 p. m. June 22 and will be completed June 23 by 2:00 p. m. The examination is held by a selected committee of high school teachers who correct and grade the papers.

The highest ten men who pass the examinations are assigned to certain State forests for six weeks practical work beginning July 1 for instruction and observation, during which their attitude toward and their fitness for the work of a forester is determined. Those who prove satisfactory in this work will be offered the scholarships by the Commissioner of Forestry. During this field-test applicants will pay transportation charge to and from the forest to which they are assigned and the Department will pay their board and lodging. Camping may be required.

#### **Conditions of Scholarships:**

After appointment each scholarship student must furnish bond of \$500 that he will complete the four year course and remain in the State Forest Service, in case his services are needed, for three years at such salary as the department may reasonably offer. On its part the State Department of Forestry contracts to provide the student, free of charge, the following for the four year course: tuition, board, room, heat, light, stationery and plain washing.

Estimated Minimum Expenses Per Year:

	Non-scholarship students.	Scholarship students.
	Penna.	Outside State
Tuition	Free	\$150
Board, 46 weeks @ \$5½	\$253	253
Room, furnished, heat, light, 46 weeks, @ \$2	92	92
Books and Instruments	35	35
Laundry, 46 weeks @ .50	23	23
Forestry Club, Athletic & Social	25	25
Expenses on field & Inspection trips	10	10
Deposit-Breakage	5	5

Clothing, personal and travelling expenses are impossible to generalize.

Students using school laundry will provide themselves with red woven laundry marks giving full name. (Order before entering from Book-Room, Forest Academy).

Deposit:

When a student enters the Academy he must make a deposit of \$5 with the Director, against which will be charged all items of unnecessary, careless, or wilful breakage or damage to State property. Whenever deposit is lowered by reason of charges against it, the student will be required to increase the deposit at the beginning of each school year to the full amount of \$5. At the time of graduation there will be returned to him whatever balance may remain to his credit.

Degree:

For the satisfactory completion of the full four years course as prescribed, the degree of Bachelor of Forestry is conferred.

COURSE OF STUDY.

Freshman Year.					
First Term.			Second Term.		
Number of course.	Subject.	Credit hours.	Number of course.	Subject.	Credit hours.
11	Botany	4	12	Botany	4
18	Chemistry	3	19	Chemistry	3
F 1	Elementary Forestry	2	22	Drawing	1
1	English	3	F 2	Elementary Forestry	2
24	German or French	2	35	German or French	2
21	Mathematics	4	2	English	3
27	Trucks & Mechanics	2	23	Plane Surveying	1
			29	Physics	3
			28	Shop	1



### Summer Session.

13	Botany	2
F 6	Silviculture	2
F 3	Forest Mensuration	2

### Sophomore Year.

First Term.			Second Term.		
14	Botany	2	F 10	Dendrology	3
20	Chemistry	2	4	English	3
3	English	3	37	German or French	2
32	Geology	3	31	Meteorology	2
36	German or French	2	33	Soils	3
38 (Elect)	Pa. History	1	25	Surveying	2
30	Physics	3	15	Zoology	3
24	Surveying	4	F 4	Forest Mensuration	2

### Summer Session.

F 11	Dendrology	1
F 5	Forest Mensuration	2
26	Forest Map	3

### Junior Year.

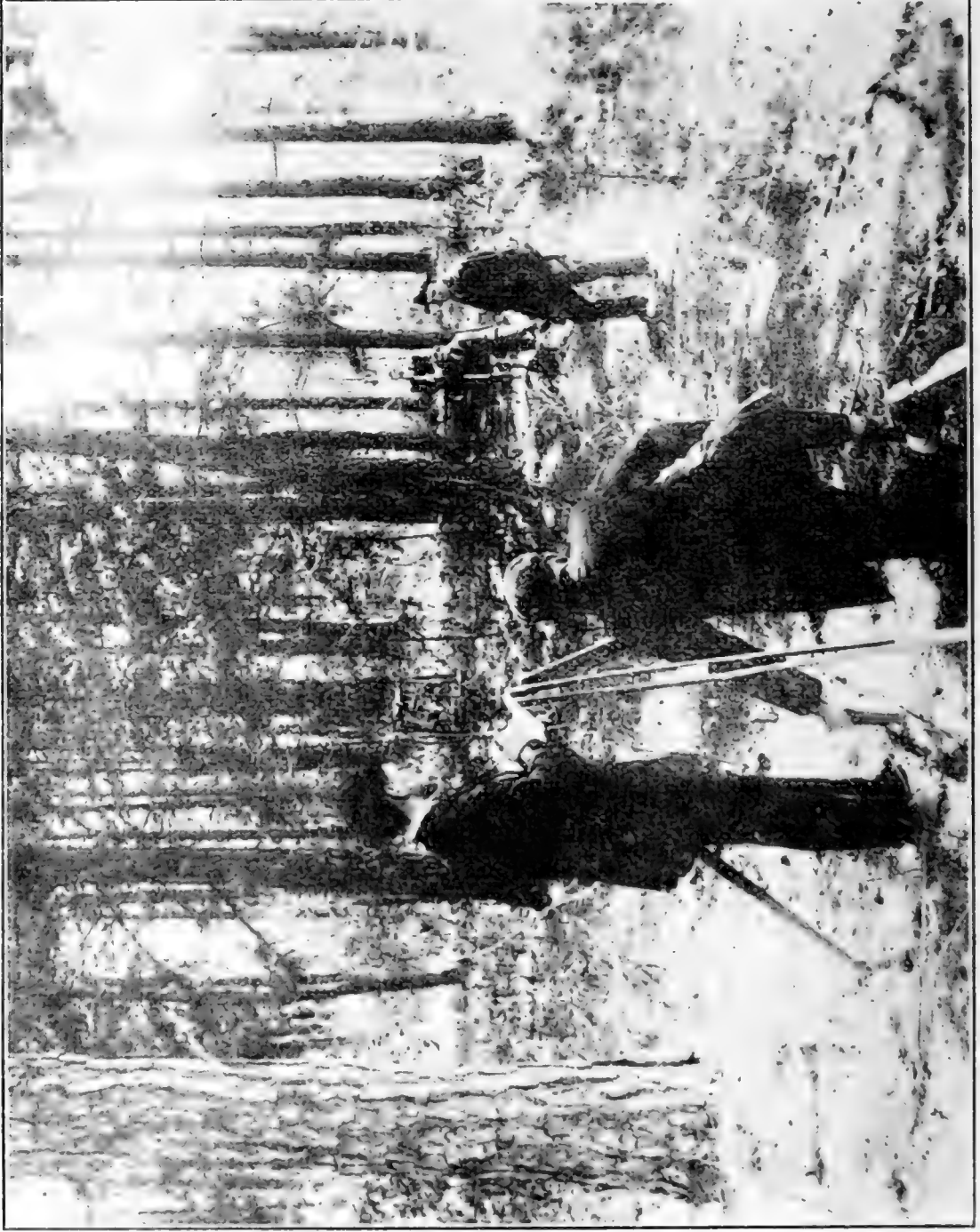
First Term.			Second Term.		
5	Accounting	1	8	Business Law	2
F 12	Dendrology	2	F 18	Forestry History	2
F 19	Forest Engineering	3	F 14	Forest Pathology	3
F 13	" Entomology	3	6	General Economics	4
F 15	" Protection	2	F 22	Lumbering	4
F 20	Mech. Properties wood.	2	F 8	Silviculture	3
F 7	Silviculture	3	F 21	Wood Identification	1
17	Wood Morphology	2			
16	Zoology	2			

### Summer Camp.

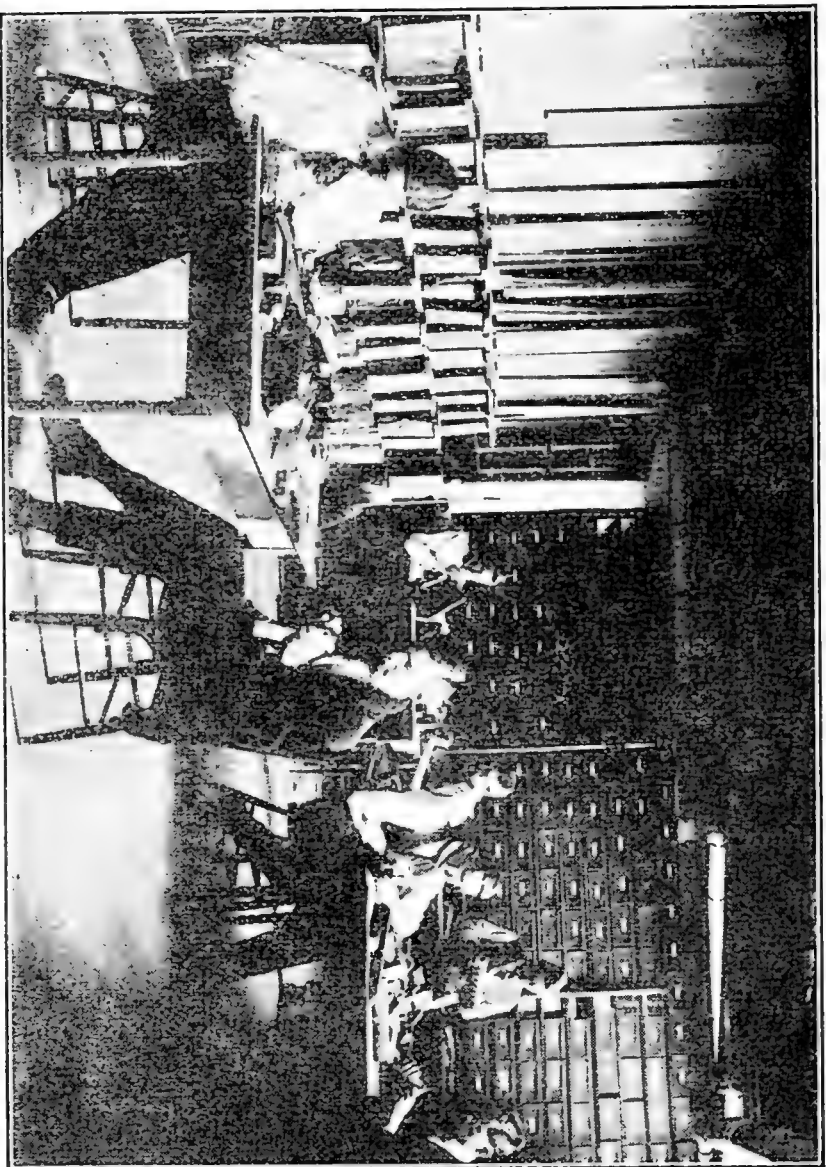
F 23	Logging & Milling	4
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### Senior Year.

First Term.			Second Term.		
F 25	Forest Economics & Policy	3	10	Fish Propagation	2
F 26	Forest Finance	4	F 29	Forest Administration	3
F 16	Forest Regulation	3	F 28	" Appraisal	3
9	Game Propagation	2	F 27	" Laws	3
7	General Economics	2	F 17	" Organization & Working Plans	4
F 9	Silviculture	3	F 31	Seminar	1
F 24	Wood Utilization	4	F 32	Thesis	5
F 30	Seminar				



A Forest Surveying Crew.



Students Identifying Wood.

## DESCRIPTION OF COURSES.

### F 1. ELEMENTARY FORESTRY.

*2 Credit Hours.*

*First Term, Freshman Year.*

A course to give the student a broad introduction to all phases of work in forestry, and of the relation of forestry to other sciences and to the nation's economic life. Text work and field trips in state forest are required. Moon & Brown's *Elements of Forestry* is used as text.

### F 2. ELEMENTARY FORESTRY.

*2 Credit Hours.*

*Second Term, Freshman Year.*

The course aims to give the student a through knowledge of the distribution of Forests in the United States and the development of the forestry idea in United States and in Pennsylvania.

### F 3. FOREST MENSURATION.

*2 Credit Hours.*

*Summer Session, Freshman Year.*

Introduction to the subject; lectures and field work on the measurement of felled trees in various units.

### F 4. FOREST MENSURATION.

*1 Credit Hour.*

*First Term, Sophomore Year*

The course aims to give the student a through knowledge of methods used in measuring volumes of single trees, either felled or standing, and of the determination of growth and yield. Graves' *Forest Mensuration* is used as text.

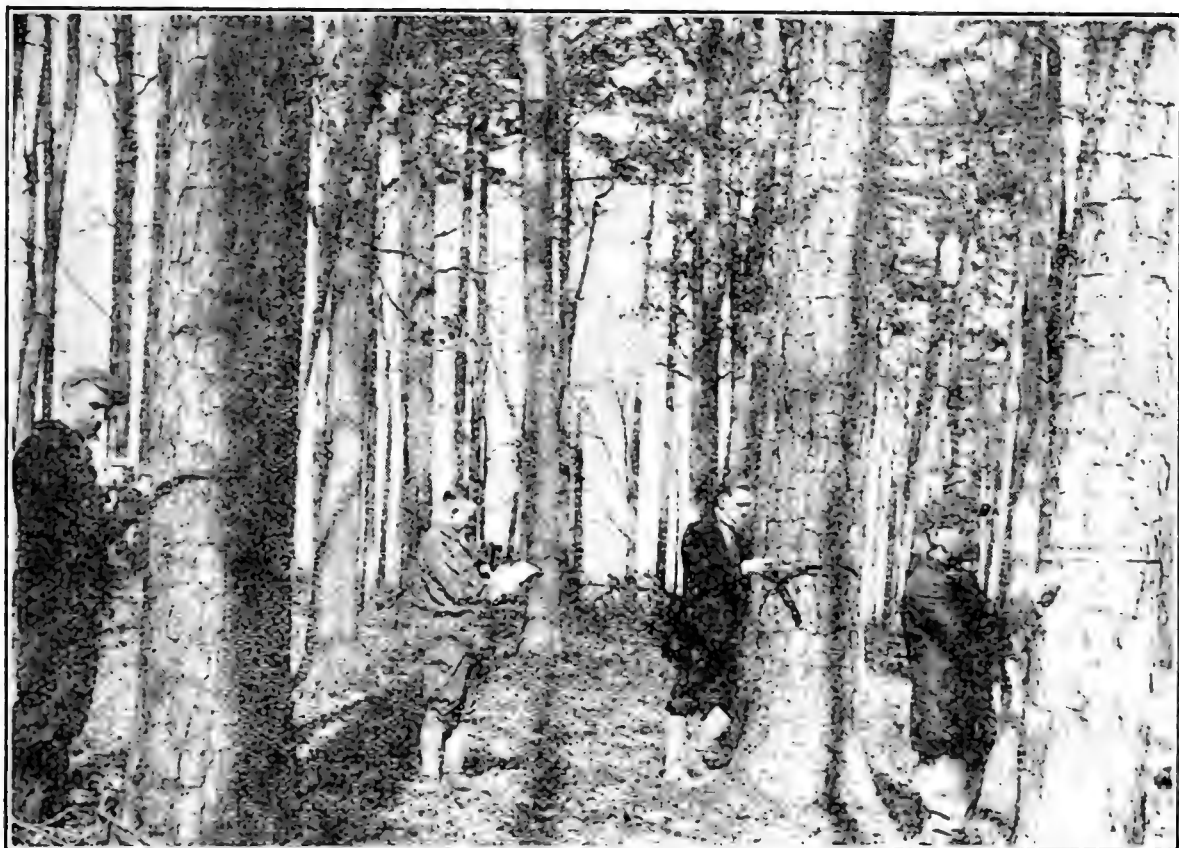
### F 5. FOREST MENSURATION.

*2 Credit Hours.*

*Summer Session, Freshman Year.*

This course consists of field work in measuring stands of timber, and study of growth and yield of stands, especially in collecting data for a working plan





Estimating Timber.



Students Measuring Tree Height with Instruments.

## F 6. SILVICULTURE & NURSERY PRACTICUM.

*2 Credit Hours.*

*Summer Session, Freshman Year.*

Operations on the Mount Alto State Forest of 23,000 acres permit students from time to time throughout their course, to take part in practical improvement, liberation and reproduction cuttings, cleaning and protection of the extensive plantation areas; but these activities, together with planting, serve especially to introduce future foresters to actual silviculture in the woods. The nearby state forest nursery of eleven acres under intensive cultivation produces annually 2,000,000 trees for reforestation work. Students take an important part in soil preparation, seed sowing, transplanting, cultural and protective measures, together with lifting, grading and packing trees for transportation. An instructor and skilled workmen are always present to make this work instructive as well as practical.

## F 7. SILVICULTURE, (SILVICS OR FOREST ECOLOGY, AND FOREST-GEOGRAPHY).

*2 Credit Hours.*

*First Term, Junior Year.*

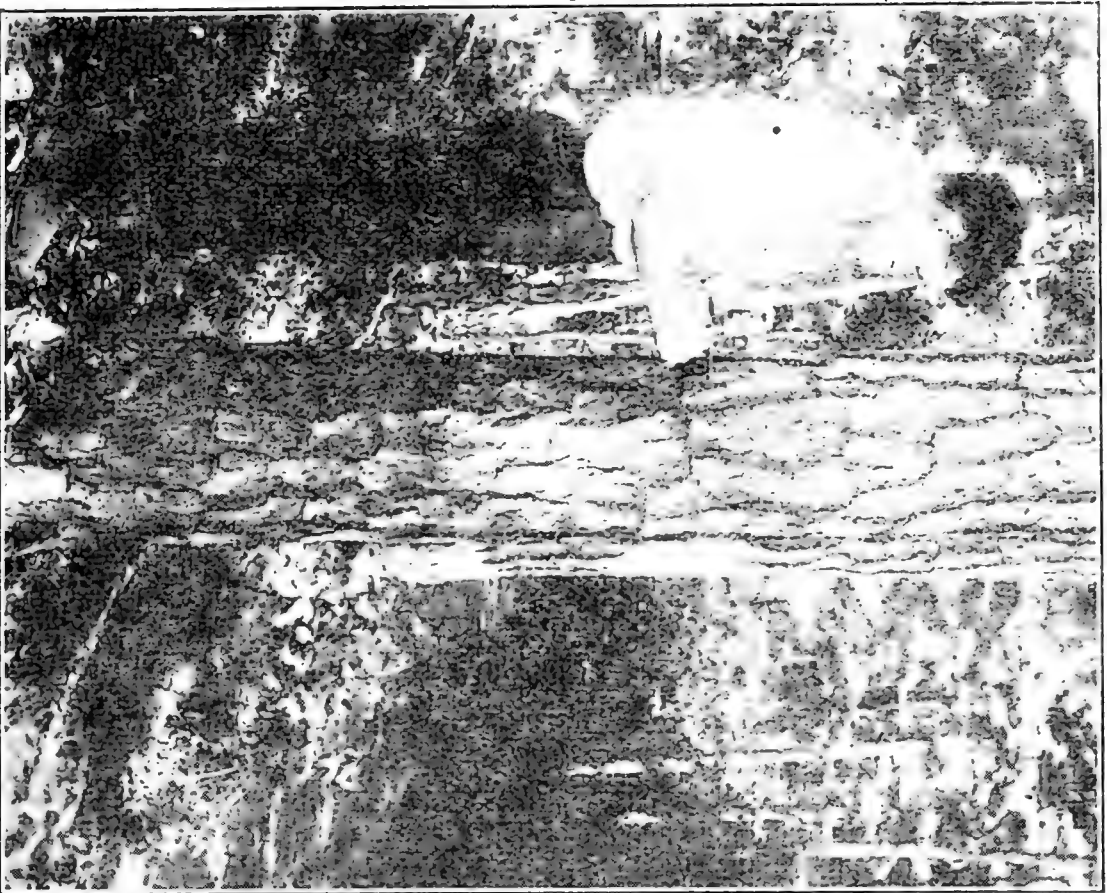
The primary effects of heat, light, wind, moisture and soil upon tree growth and distribution are thoroughly discussed; followed by the effects of forests on climate and soil, the internal struggle of the stand, site quality assessment, stand description and forest types. Application of the basic fact of silvics and dendrology to the actual forest is made in a series of lectures in forest geography and physiography; embracing a detailed study of the forest regions and types of the United States and Canada, with a general survey and discussion of the important forested areas of the world noting in particular their structure, ecology and possibility of economic development. Many references are used and abstracts required of each student. Considerable material given in the course is derived from Schlich's *Silviculture*, Mayr's *Waldbau*, and Bowman's *Forest Physiology*.

## F 8. SILVICULTURE. (SEEDING AND PLANTING).

*3 Credit Hours*

*Second Term, Junior Year.*

Seed production, collection, extraction and storage, nursery work and administration. Direct seeding and plantation establishment. Reforestation problems and progress are studied in the field and a planting plan prepared for a definite area of denuded land. Under trained and skilled supervision, students follow the trees through each stage of nursery practice, from staking out beds to final shipment or planting in the forest. Problems in nursery management, technique and protection are discussed in detail. Students participate in various experimental work which is always under way, and are given experience in directing work in nursery and planting operations. Costs are calculated for work done and stock produced; inventories are made; nursery accounting and plantation report forms are explained and used. Towney's *Seeding and Planting* is text used with supplementary notes from other sources.



Finding the Age of a Tree.



Measuring Height Growth of Scotch Pines.

## F 9. SILVICULTURE. (SYSTEMS OF NATURAL REGENERATION).

*3 Credit Hours*

*First Term, Senior Year.*

Critical comparisons are made between pure and mixed woods, high and low forest forms; natural and artificial regeneration; the silvicultural systems; methods of thinning, forest conversion and improvement. Cleanings, liberation and damage cuttings, and treatment of wood-lots are considered from an experimental as well as theoretical and empirical standpoint. The location of the school here where the South Mountains, managed for a century prior to their acquisition by the state for continuous yields of charcoal for the iron industry, adjoins an extensive agricultural area with scattered farm wood-lots, give it a vast natural outdoor laboratory for silvicultural instruction. This has been improved during the past twenty years by the establishment of more than 600 acres of plantations of many species and upon a variety of sites. Hawley's *Silviculture* and Graves' *Principles of Handling Woodlands* are the texts used, with Schilch's *Silviculture*, Mayr's *Waldbau* and *Traite Pratique de Silviculture* by Jolyet as chief reference works.

## F 10. DENDROLOGY.

*3 Credit Hours*

*Second Term, Sophomore Year.*

A systematic and biological study of the trees of the United States and introduced species, stressing the important timber producers. Special attention is given coniferous species native to temperate climates similar to that of Pennsylvania. Form, distinguishing characteristics, reproduction, occurrence and range are taken up in detail. In the first semester tree identification in the field is begun by a series of brief trips and a collection of winter buds, mounted on cards and representing 150 species, as required. Keys are worked out by the students for both winter and summer use. About 100 important trees of the locality are observed thru-out the year by assigned students and phenological data recorded. The growing school collection of photos, slides, herbarium mounts and other dried material of the important forest species adds interest to lecture room instruction. In addition to numerous references, texts especially followed are: Illick's *Pennsylvania Trees*; Sargent's *Manual of Trees of North America*; Hough's *Handbook of Trees of North-eastern United States and Canada*; Mayr's *Fremlandische Wald- und Park baume fur Europa*; publications of the U. S. Forest Service, by Geo. B. Sudworth and others.

## F 11. DENDROLOGY. (TREE IDENTIFICATION).

*1 Credit Hour*

*Summer Session, Sophomore Year.*

A field course embracing the study of all woody vegetation in the vicinity of Mont Alto, where more than 150 species of trees and



shrubs are native within a radius of ten miles. Including exotics, students are familiarized with about 250 species. The Forest Academy is so located that it lies within the ranges of many northern and southern trees which overlap here, and this naturally advantageous site has been supplemented by an arboretum, containing the more important forest trees of the Western U. S. and temperate foreign countries. In addition to many half days spent in adjacent forest and fields, during the course all-day field-trips are made to the Potomac River, North Mountains, Pen Mar and several localities in the fertile and historic Cumberland Valley, permitting the study of trees under widely varying conditions of growth and habitat. Field tests cover 800 to 900 specimens. Tests used are Illick's *Pennsylvania Trees* and *Checklist of Trees of Franklin County*.

## F 12. DENDROLOGY.

*3 Credit Hours.*

*First Term, Junior Year.*

Continuation of course (F 10.)

## F 13. FOREST ENTOMOLOGY.

*3 Credit Hours*

*First Term, Junior Year.*

A general discussion of the morphology, physiology, development and classification of insects; the life history of both beneficial and injurious species, with special reference to those forms which are of economic importance in the forest. Sanderson and Jackson's *Elementary Entomology* is the text used, supplemented by reference to various State and National bulletins on insects of economic importance.

## F 14. BOTANY, FOREST PATHOLOGY.

*3 Credit Hours*

*Second Term, Junior Year.*

A course considering representative tree diseases caused by cryptogamic parasites and saprophytes and parasitic flowering plants. Preventive and remedial measures for checking their damage are discussed. Class and laboratory are supplemented by field exercises. Rankin's *Tree Diseases* is the text used.

## F 15. FOREST PROTECTION.

*2 Credit Hours*

*First Term, Junior Year.*

Lectures and reference reading covering a complete discussion of general forest protection with special detailed discussion of protection against fire. Special reference is made to Pennsylvania conditions and actual field work in forest protection is included in the course as part of the school work. All students are enrolled in organized fire crews and take part in the extinction of forest fires on the Mont Alto and Michaux Forests.

## F 16. FOREST REGULATION.

*3 Credit Hours*

*First Term, Senior Year.*

The broad and general principles of forest management are first considered. Every effort thru-out the course is directed toward the practical correlation and application of facts, data and rules derived in other scientific and forestry courses. A proper and clear concept of the normal or ideal forest with continuous yield and other attributes, is held before the student until every phase is firmly grasped. The fundamentals of increment, growing stock and age classes are studied in detail; then follows the drafting of formulation of felling budgets and solution of problems that arise in the effort to attain normality upon forest areas with given conditions. Critical studies are made of the various formulae and methods whereby an approximation to the normal forest may be achieved. Texts used are Roth's *Forest Regulation* and Recknagel's *Theory and Practice of Forest Working Plans*.

## F 17. FOREST ORGANIZATION AND WORKING PLANS.

*4 Credit Hours*

*Second Term, Senior Year.*

This course is a continuation of that in Forest Regulation but embodies more field work and takes up geometric, quantitative and qualitative surveys of a specific forest area, with the theory and practice of forest subdivision and stand differentiation. A portion of a State Forest is annually taken up and divided into permanent compartments for silvicultural and administrative purposes. Careful stock surveys, made in conjunction with the sophomore class in mensuration, furnish a basis for the creation of more or less temporary sub-compartments, coextensive with some definite and important stand condition, such as age, species, density, site or future silvicultural treatment. The compartment lines are demarcated upon the ground, while the lines of sub-compartments usually are not. Working plan reports and maps are required of each student, and all necessary facilities for efficient work toward this end, such as transportation and technical instruments, are furnished by the school or forest officers. References used include Schlich's *Forest Management*, Kaiser's *Einteilung der Forsten* and Wagner's *Grundlagen der räumlichen Ordnung im Walde*.

## F 18. FOREST HISTORY.

*2 Credit Hours*

*Second Term, Junior Year.*

A course giving more or less detailed information as to development of forest property, forest conditions, forest investigation, and handling of forest properties for timber production in the principal countries of the world. Special attention is given to development of forestry in Pennsylvania. Fernow's *History of Forestry* is used as a text.

## F 19. FOREST ENGINEERING.

*3 Credit Hours*

*First Term, Junior Year.*

Principles of forest roads, practical survey and construction. Construction of trails, bridges, telephone lines, fire towers.

Logging railroads, grades and curves.

Finding the flow of springs and streams.

Roads text—*Highway Engineering—Chatburn.*

## F 20. MECHANICAL PROPERTIES OF WOOD.

*2 Credit Hours*

*First Term, Junior Year.*

This course aims to acquaint the student with the physical properties of wood, the factors that affect them, and the methods giving these properties actual values through timber testing. Record's *Mechanical Properties of Wood* is used as text.

## F 21. WOOD IDENTIFICATION.

*1 Credit Hour.*

*Second Term, Junior Year.*

A detailed study of the methods used and practice on actual specimens of the various important commercial woods of the United States.

## F 22. LUMBERING.

*4 Credit Hours*

*Second Term, Junior Year.*

This course aims to show in detail how the products of the forests are harvested, and prepared for the market. It includes actual work in the woods and in the manufacture, in a state owned plant, of lumber shingles, lath, ties, etc. The text in use is Bryant's *Logging*.

## F 23. LOGGING AND MILLING.

*4 Credit Hours*

*Summer Session, Junior Year.*

This course includes a 6-8 weeks trip to a large saw-mill operation and includes a study of methods, costs, etc., from stump to car and a detailed report on the same.

## F 24. WOOD UTILIZATION.

*4 Credit Hours*

*First Term, Senior Year.*

This course includes a study of the industries that further manufacture the timber and other rough materials removed from the forest in lumbering operations. It includes a study of the wood using industries of Pennsylvania. The texts used are Brown's *Forest Products* and *Wood Using Industries of Pennsylvania* (Dept. Bulletin No. 9).



A Lesson in Saw Filing.



Students Making Chestnut Shingles.



## F 25. FOREST ECONOMICS AND POLICY.

*3 Credit Hours*

*First Term, Senior Year*

A study of the social utilities flowing from forests and the importance of forests and forest products in industry. The continuing depletion of our forests; the possibilities for continuous production. The policy of nations, states and municipalities toward forest propagation. Government ownership, control and cooperative policies.

Lectures.

## F 26. FOREST FINANCE.

*4 Credit Hours*

*First Term, Senior Year.*

Forest property from the investment point of view. Calculation involving principles of compound interest and annual charges: Interest rate; net income; financial maturity; carrying charges; methods of comparing financial results under different methods of treatment; forestry compared with agriculture; forest taxation. References, Roth's *Forest Valuation* and Chapman's *Forest Valuation*.

## F 27. FOREST LAWS.

*3 Credit Hours*

*Second Term, Senior Year.*

A brief review of the Forest Laws in the U. S. Texts, Kinney on *Forest and Timber Law*.

Supplemented by a course of lectures on the powers of forest officers as peace officers.

## F 28. FOREST APPRAISAL.

*3 Credit Hours*

*Second Term, Senior Year.*

The valuation of forest properties; determination of stumpage values; assessment of forest damage. Lectures.

## F 29. FOREST ADMINISTRATION.

*3 Credit Hours*

*Second Term, Senior Year.*

This course aims to acquaint the student with the principles used in the organization of the business administration and personnel to care for forest property. The present status and methods used in the State Forests, National Forests and Private Forests will be discussed. Lectures and reading.

## F 30. SEMINAR.

*1 Credit Hour*

*First and Second Term, Senior Year.*

A round table discussion of professional forestry movements, events and literature. Includes preparation of papers, reviews and, leading discussions.

## F 31. THESIS.

*5 Credit Hours*

*Last 6 weeks, Senior Year, Second Term.*

Each student will make a special field study of a subject approved at the end of the Junior year. These subjects will generally fall under the heads of transportation, seasoning, preservation, or price studies of lumber; timber accounting; special product studies; silvicultural or management investigations, etc.

### 1. ENGLISH.

*3 Credit Hours*

*First Term, Freshman Year.*

This course includes a review of the essentials of English grammar, the rules for capitalization, punctuation, and business correspondence. Themes on pertinent subjects are required frequently. "*English Composition in Theory and Practice*" by Canby and others is the text used. "*Wooley's Handbook of Composition*" is used for reference.

### 2. ENGLISH.

*3 Credit Hours*

*Second Term, Freshman Year.*

The whole field of prose and poetical composition is studied in general and detail from the standpoint of the three underlying principles governing all good composition, unity, coherence, and emphasis. Themes and other exercises illustrating these principles are required. The mechanics of writing are continued as in English 1. Representative classics are read.

### 3. ENGLISH.

*3 Credit Hours*

*First Term, Sophomore Year.*

A brief review of world literature as a whole, followed by a summary of English and American literature with particular attention given to the study of the scientific writings of such authors as Roosevelt, Muir, Burroughs, Thoreau, and Fabre.

### 4. ENGLISH.

*3 Credit Hours.*

*Second Term, Sophomore Year.*

A continuation of English 3 with emphasis upon the encouragement of the student to put his English into effective, practical use by exercises in debating, public speaking, and parliamentary practice. Themes.

### 5. ACCOUNTING.

*1 Credit Hour*

*Junior Year, First Term.*

Principles of accounting: Single and double entry procedure: Different kinds of accounts: Depreciation budgets: Accounting as applied to forest finances and records: Pennsylvania Dept. of Forestry prescribed accounts. Use of checks, drafts, notes, mortgages.

## 6. ECONOMICS.

*4 Credit Hours*

*Second Term, Junior Year.*

Principles of economics, Capital; Labor; Business Organization; Money and Banking; Monopoly; Transportation. Taussig's *Principles of Economics Vols. 1 & 2.*

## 7. ECONOMICS.

*2 Credit Hours*

*First Term, Senior Year.*

Continuation of Economics 1, followed by a study of Taxation and Public revenue.

## 8. - BUSINESS LAW.

*2 Credit Hours*

*Junior Year, Second Term.*

An elementary study of Elements of Business Law with special reference to contracts, and property. Huffcut's *The Elements of Business Law*, is the text used.

## 9. GAME PROPAGATION.

*2 Credit Hours*

*First Term, Senior Year.*

Course of lectures by Specialist from Game Commission. A state game preserve located on the school forest is a valuable object lesson in game propagation. The school forest now contains hundreds of deer and much smaller game.

## 10. FISH PROPAGATION.

*2 Credit Hours.*

*Second Term, Senior Year.*

Course of lectures by Specialist from the Fish Commission.

## 11. BOTANY.

*4 Credit Hours*

*First Term, Freshman Year.*

Morphology of the Spermatophytes.

A course specially adapted to the early and fundamental training of the forester. It comprises a study of the external and internal morphology and physiology of the six primary parts of the seed bearing plants. Tree material is used where possible to illustrate the different parts of the plant system. Part 1 of Ganong's "*A Text-book of Botany for Colleges*" is used.

## 12. BOTANY.

*4 Credit Hours*

*Second Term, Freshman Year.*

Evolution of the Plant Kingdom.

A careful study of the morphology of representative examples among the algae, fungi, liverworts, mosses, ferns, gymnosperms and angiosperms is pursued in the laboratory and in the field. Special

attention is given to the alternation of generations in the plants studied and in working out their life histories, the progression and retrogression of certain organs and phases in proceeding from the lower to the higher plants are noted. Field trips are made once a week to enable the student to collect and study the plants in their natural habitats. Part 2 of Ganong's *A Text-book of Botany for Colleges* is used.

### 13. BOTANY.

*2 Credit Hours*

*Summer Session, Freshman Year.*

#### Taxonomy.

A comparative study is made in the field of the families of plant groups and special training is given in the methods of collection and preservation of material. Each student is required to make an herbarium of at least 125 species of herbaceous plants and to learn common and scientific names of at least 180 plants. Emphasis is laid on the key for identification of the plants. Gray's *New Manual of Botany* and Britton and Brown's *Illustrated Flora of the Northern States and Canada* are the text and reference used.

### 14. BOTANY.

*2 Credit Hours.*

*First Term, Sophomore Year.*

#### Plant Ecology.

The course deals with the relation of plants to their environment. First, there is a study of the ecological factors, which in general are grouped under physical, climatic and biotic factors. This is followed by a discussion of succession, the struggle for existence among plants, the laws of migration, the analysis of vegetation forms and structures, plant formations and societies.

In the laboratory different members of the plant are studied as to their special functions and their relation to environment. The stem, root, leaf, flower, etc., are carefully examined and their ecological relations pointed out.

The Forest Academy is very favorably located for the field study of Plant Ecology, as a great variety of plant life conditions may be found in the immediate vicinity of the school. Therefore, students are able to work in the adjoining fields and forests, which is a decided advantage over the studying of plant life processes in the laboratory.

### 15. ZOOLOGY.

*3 Credit Hours.*

*Second Term, Sophomore Year.*

#### General Zoology.

In this course a general survey is made of the animal kingdom from the Protozoa to the Chordata. In the laboratory each student dissects an animal typical of each phylum and makes drawings of the parts observed. Hegner's *College Zoology* is the text used.

## 16. ZOOLOGY.

*2 Credit Hours.*

*First Term, Junior Year.*

A review of cordata including Mammals and birds indigenous to Penna.

## 17. BOTANY.

*2 Credit Hours.*

*First Term, Junior Year.*

Wood Morphology.

A study of the microscopic structural features of wood. Representative type specimens of the conifers and broad leaved trees are studied in detail with compound microscopes in order to determine the occurrence, form and structure of the wood elements. All structural features which are of value in distinguishing the different woods are studied under the simple and compound microscope from cross, radial and tangential sections of the different woods. Record's *Identification of the Economic Woods of the United States* and Jeffrey's *The Anatomy of Woody Plants* are used as texts and reference.

## 18. CHEMISTRY.

*3 Credit Hours.*

*First Term, Freshmen Year*

This course comprises a study of the metals and non-metals. Lectures and recitations are correlated with laboratory experiments to illustrate fundamental facts and general principles. The acquisition of a chemical vocabulary and of initiative and skill in making observations receives special emphasis. Kahlenberg's *Outline of Chemistry* is used.

## 19. CHEMISTRY.

*3 Credit Hours.*

*Second Term, Freshman Year.*

The main outlines and general methods of qualitative and quantitative analysis are studied. Stress is laid upon the development of accuracy and efficiency in method and technique, rather than upon the mere acquisition of facts.

## 20. CHEMISTRY.

*2 Credit Hours.*

*First Term, Sophomore Year.*

The general outlines of organic chemistry as a whole are first studied. Then the methods of deriving and manufacturing the chemical products of forest origin are presented. Reports to the class on special subjects assigned for experiment or investigation are required from time to time. Hart's *Organic Chemistry* is the text used. The reading of Slosson's *Creative Chemistry* is required.

## 21. TRIGONOMETRY.

*4 Credit Hours,*

*First Term, Freshman Year.*

The course covers trigonometric analysis, right and oblique triangles, and the use of logarithms and tables. Special stress is laid upon the solution of practical problems with accuracy and speed. Right, quadrantal and oblique spherical triangles are covered briefly, em-



phasizing the practical application of spherical trigonometry. Philips and Strong's *Elements of Trigonometry* is followed as a text, but problems and illustrations from other authorities are frequently taken up in class and special assignment.

## 22. DRAWING.

1 Credit Hour.

*Second Term, Freshman Year.*

The use of drawing instruments. Lettering. Tracing. Blue-printing.

Projections. Drawing of simple construction.

The plotting of compass surveys in coordination with Surveying.

## 23. PLANE SURVEYING.

1 Credit Hour.

*Second Term, Freshman Year.*

An elementary course intended to clear the way for advance surveying and improve the students sense of position and direction in the woods. It gives the student a better grounding for sample plots, strip surveys, timber cruising and the use of mensuration instruments in the summer term, and second year course in Forest Mensuration. Linear measurement—pacing, chain, tape; compass surveying—latitudes and departures, error of closure and area calculation; Simple traverse-board sketching; Use of aneroid; Use of Abney level.

## 24. PLANE SURVEYING.

3 Credit Hours.

*First Term, Sophomore Year.*

Advanced work. *The engineers transit*—traverses by direct angle, deflection angle, azimuth methods; Stadia surveying; Meridian determination; Gradiometer attachment for road grades; Trigonometric levelling; Transit for spirit levelling;

*The Wye level*—in precise levelling, differential levelling, setting stakes to grade for road, drain and construction work.

*Plane table* with telescopic alidade, three point determination, the making of a plane table map.

Testing and adjustment of instruments. Plotting of field notes, maps and profiles.

## 25. TOPOGRAPHIC SURVEYING.

2 Credit Hours.

*Second Term, Sophomore Year.*

(a) Rough rapid survey, compass, pacing, aneroid; Principal of contours.

(b) Accurate mapping. Triangulation—base line measurement; determination of angles with methods of repetition and series; Correlation of different instruments for different parts of a survey.

## 26. FOREST MAP.

*2 Credit Hours.*

*Summer Session, Sophomore Year.*

The construction of a contour map of 2500 acres of mountain land—field work—drafting—tracing and blue printing. Practice for Surveying 25.

## 27. TRUCKS AND MECHANICS.

*2 Credit Hours*

*First Term, Freshman Year.*

This course aims to give the student a practical working knowledge of automobile and truck driving and maintenance through work in class room, garage, and on the road. Steam Engine, sawmill equipment, and telephone work, such as might be encountered in the forest are taken up. Frazer & Jones' *Motor Vehicles and their Engines* is used as reference.

## 28. SHOP.

*1 Credit Hour*

*Second Term, Freshman Year.*

This course aims to give the student a working knowledge of the tools used in rough construction of wood and metal. Active Shop work in making of tenons and joints for wood work, and of important phases of black-smithing will be covered. A large well lighted workshop, well equipped with the necessary tools will be used for instruction.

## 29. PHYSICS.

*3 Credit Hours*

*Second Term, Freshman Year.*

This course includes a study by observation and experiment of the principal phenomena of matter and energy together with an application of general principles to the solution of forest problems. Kimball's *College Physics* is the text used.

## 30. PHYSICS.

*3 Credit Hours*

*First Term, Sophomore Year.*

Continuation of course 29.

## 31. METEOROLOGY.

*2 Credit Hours*

*First Term, Sophomore Year.*

This course introduces the student to scientific methods used in determination of the various climatic factors and their relation to weather changes. United States weather maps are received daily and methods of forecasting explained. Milham's *Meteorology* is used as text.

### 32. GEOLOGY.

*3 Credit Hours*

*First Term, Sophomore Year.*

A course designed to give an introduction to general geologic principles. Attention is paid particularly to the dynamical, structural, and historical geology of Pennsylvania with reference to the processes involved in the development of the present topographic and the soil provinces of the state. Field excursions based on the use of topographic maps are made from time to time. Chamberlain and Salisbury's *College Geology* is used.

### 33. SOILS.

*3 Credit Hours*

*First Term, Sophomore Year.*

This course aims to develop by observation and experiment the principles governing the properties and management of field and forest soils. Field work is required to illustrate soil survey methods, and to harmonize theory with practice in application of the conclusions derived from laboratory experiments. Students are required to report on the analysis of one soil sample brought from a typical locality near their homes. *Soils* by Lyon, Fippin, and Buckman is the text used.

### 34. GERMAN.

*2 Credit Hours*

*First Term, Freshman Year.*

A course comprising a careful drill in pronunciation and the principles of German Grammar. Selected German texts and Thomas' *Practical German Grammar* are used.

### 35. GERMAN.

*2 Credit Hours*

*Second Term, Freshman Year.*

Continuation of (34) German with selected texts.

### 36. GERMAN.

*2 Credit Hours*

*First Term, Sophomore Year.*

Course in Scientific German, Gore's *German Science Reader* and selected texts.

### 37. GERMAN.

*2 Credit Hours*

*Second Term, Sophomore Year.*

Continuation of preceding course with selected forestry texts. Hausrath's *Der Deutsche Wald* is the first text used.

## STUDENT REGISTER.

### *Class of 1921.*

<i>Name.</i>	<i>Residence.</i>
Bradley, Tom Oswald, .....	Mercersburg, Pa.
Brouse, Edgar Frederick, .....	Boalsburg, Pa.
Clepper, Henry Edward, .....	542 Locust St., Columbia, Pa.
Haupt, Richard Ritchey, .....	Mercersburg, Pa.
Kreamer, George Parfeit, .....	574 Carey Ave., Wilkes-Barre, Pa.
Kutz, Donald Bentley, .....	231 Franklin St., Reading, Pa.
Lefkof, Emil Alfred, .....	422 N. Main St., Wilkes-Barre, Pa.
Mosch, Walter Fred, .....	Coudersport, Pa.
Nicholas, Herbert Murray, .....	538 E. Market St., York, Pa.
Shaw, Thomas Edward, .....	207 W. 7th St., Chester, Pa.
Swingler, William Sherman, .....	544 Cherry St., Columbia, Pa.
Shirey, Thaddeus Irwin, .....	212 S. 16th St., Reading, Pa.
Taber, William Stone, .....	725 Wilson St., Williamsport, Pa.

### *Class of 1922.*

August, William A., .....	1223 E. Pine St., Mahanoy City, Pa.
Frontz, Leroy, .....	Allenwood, Pa.
Lott, Hugh Carlin, .....	Springville, Pa.
Shulley, Frederick, .....	1650 Muhlenberg St., Reading, Pa.
Somers, Gayle Hamilton, .....	Renton, Pa.
Stott, Calvin Brill, .....	1608 Perkiomen St., Reading, Pa.
Yehl, Richard Kuhns, .....	1531 Hanover Ave., Allentown, Pa.

### *Class of 1924. (Four Year Course)*

Dunmire, Daniel Edward, .....	240 Unity St., Greensburg, Pa.
Feuchsel, Charles F., .....	5213 Baltimore Ave., Phila., Pa.
Genaux, Charles M., .....	Shinglehouse, Pa.
Geltz, Charles G., .....	810 Ridge Ave., McKeesport, Pa.
Holtz, Irenus B., .....	Ashville, Pa.
Moll, Wilford P., .....	East Greenville, Pa.
Norris, Thomas G., .....	Philipsburg, Pa.
Schaeffer, Charles H., .....	419 W. King St., Lancaster, Pa.
Schlatter, Ernest J., .....	Tunkhannock, Pa.
Schoen, Paul W., .....	1127 Division St., Scranton, Pa.

### *Class of 1925.*

Anderson, Hartley Kirtland, .....	4630 5th Ave., Pittsburgh, Pa.
Bowlby, Irving Stickles, .....	324 S. River St., Wilkes-Barre, Pa.
Carnegie, William, .....	1569 Earl St., Wilkinsburg, Pa.
Eby, Harry G., .....	Washington St., Chambersburg, Pa.
Forsythe, Howard Yost, .....	213 Lockhart St., Sayre, Pa.
Frampton, Samuel R., .....	1127 East St., Wilkinsburg, Pa.
Feeman, Abraham, .....	109 Canal St., Lebanon, Pa.

Hughes, Charles Collins, .....Collegeville, Pa.  
 Kerns, Chester Merrill, .....220 Allegheny St., Jersey Shore, Pa.  
 Le Duc, Edmond, .....Mont Alto, Pa.  
 McNees, Wayne Anthony, .....616 9th Ave., New Brighton, Pa.  
 Nixon, Robert Brighton, .....2160 N. 19th St., Philadelphia, Pa.  
 Pardoe, Homer W., .....532 Market St., Williamsport, Pa.  
 Sebring, Harold Martin, .....62 S. Sherman Ave. Allentown, Pa.  
 Smith, Harry Frederick, .....416 Main St., Kingston, Pa.  
 Smith, Ralph Wilson, .....8 Stout St., Pittston, Pa.  
 Sipe, Francis Henry, .....Somerset, Pa.  
 Somers, Frances Wilkinson, .....Renton, Pa.  
 Stauffer, Jacob Martin, .....43 S. 5th Ave., Coatesville, Pa.  
 Wilcox, Ralph F., .....New Albany, Pa.  
 Wood, Cyrus G. ....Mont Alto, Pa.  
 Woods, Ignatius Leroy, .....Marienville, Pa.



















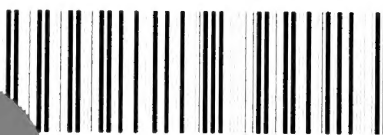








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