THE HARVARD FOREST AND HARVARD BLACK ROCK FOREST
1964-65

Harvard University

Annual Report

Petersham

Massachusetts

(Preprinted from the Report of the President of Harvard College and Reports of Departments, 1964–65)

Harvard Forest

Staff

The research staff of the Forest during the year 1964–65 consisted of Ernest M. Gould, Jr., Forest Economist; Walter H. Lyford, Soil Scientist; William F. Murison, Forest Biologist; Jack J. Karnig, Forest Manager for both the Harvard and Black Rock Forests; and myself. Charles F. Upham continued as Woods Superintendent, Barbara M. Kelley as Business Secretary and Librarian, and Julia W. Savage as Secretarial Assistant and Typist.

Research and Publications

The Harvard Forest Simulation Project was continued throughout the year under the direction of Dr. Gould. An initial model, designed primarily for training purposes, was published in the late summer of 1964 as *H. F. Paper* No. 13, entitled "Simulation, a step toward better forest planning." It was prepared by Dr. Gould in collaboration with Dr. William G. O'Regan of the U. S. Forest Service. A more elaborate model worked out by Dr. Gould and Mr. Gerald Walton while the latter was a graduate student at the Forest in 1963–64 was perfected and tested. In the spring of 1965 a grant of $30,000 came from the U. S. Forest Service to support a new phase of the Project, wherein aesthetic values in the use of forest land will be added to the variables previously considered in the model. In addition to the above-mentioned paper on simulation, Dr. Gould also published during the year his article on "The future of forests in society" (*Forestry*

Chronicle, v.40, p.431–444), noted briefly in my report of last year.

Studies of the root systems of forest trees, begun some years ago at the Black Rock Forest by Benjamin Stout, have been greatly elaborated recently by Mr. Walter H. Lyford, our Soil Scientist, and Dr. Brayton F. Wilson, Biologist on the resident staff of the Cabot Foundation. These men began with detailed investigations of the anatomy and distribution of red maple roots. They then discovered that living roots could be kept alive and growing while still attached to large parent trees. This has opened the way to a wide field of experimentation upon which they are now embarked. Two publications came from their work during the year. The first, *H. F. Paper* No. 10 by the two men as joint authors, on the "Development of the root system of Acer rubrum L."; and the second, *H. F. Paper* No. 11 by Dr. Wilson on the "Structure and growth of woody roots of Acer rubrum L."

Two of my own papers appeared during the year. One of them, mentioned in my last year's report, was prepared in collaboration with Mr. Frederick Johnson, on "Geobotanical and archaeological reconnaissance in southwestern Yukon" (*Papers of the R. S. Peabody Found. for Archaeol.*, v.6, p.1–198). The other is on "Some problems in ecological theory and their relation to conservation" (*Jour. Ecol.*, v.52 (Suppl.), p.19–28).

Research Fellows and Graduate Students

Four Charles Bullard Fellowships for research in forestry were awarded for the year 1964–65: to Dr. Paul W. Richards, Professor of Botany at University College, North Wales; Dr. Chester T. Youngberg, Professor of Forest Soils at Oregon State University; Dr. Ronald Bartoo, Professor of Forest Economics at Pennsylvania State College of Forestry; and Mr. Gerald C. Williams of the U.S. Bureau of Land Management in Idaho. Professors Richards and Youngberg, with their families, were resident at the Forest in Petersham while the others lived and carried on most of their work in Cambridge. A major purpose of the Bullard Fellowships is to release such men as these from routine respon-

Excursionists from the VII Congress of the International Association for Quaternary Research discuss glacial history and soil development in the Harvard Forest. August, 1965.

sibilities so that they have a year free for research of their choice, or merely for broadening their intellectual horizons. A by-product of inestimable value has been their presence in our midst.

Mr. Thomas Yang, of the Faculty of Forestry of the University of Taiwan, was a graduate student here for the academic year 1964–65. He came in September and spent the first semester taking courses in Cambridge. The second term, at the Forest, was devoted to his thesis. A new student, Mr. W. R. Sise, arrived in mid-June, 1965, to begin preliminary work toward the Master of Forest Science degree. He is from the New York State College of Forestry. Another graduate student who arrived in June was Mr. Jon Cassista, holder of a Cabot Foundation Fellowship. He has finished his residence requirements for a doctorate in biology, and is now working on his thesis in tree physiology.

Conferences, Classes, and Visitors

The use of the Harvard Forest as a medium for teaching and demonstration continues to grow, both in volume and variety. Approximately 450 persons who came to the Forest during the year were accorded staff time for these purposes. The time periods ranged from one–two hours up to two weeks. A basic characteristic of all of this staff work, and fundamental to its usefulness, is its informality. Largely because of this it is impossible to estimate the actual preparation and contact time spent upon it. Approximately 165 of the people who came to the Forest had overnight accommodations for periods of up to two weeks.

The eleventh annual Conference on Forest Production was held from October 11 to 23, with 13 professional foresters in attendance. In the week prior to the opening of University classes in late September, about 15 graduate students of landscape architecture from the Harvard School of Design came to the Forest for a five-day introductory course in natural environments. During the autumn the Forest was used for week-end field trips by classes of students in General Ecology and Plant Geography, and by science teachers in the Graduate School of Education. In the spring the forestry schools of the Northeastern States take their

The Overseer's Committee to Visit the Department of Biology meets at the Harvard Forest. June, 1964.

students, usually their third-year undergraduates and graduate students, on tours to research and operating forests. Our institution has been a regular stop on a number of these tours for many years, and the spring of 1965 brought classes from the New York State College of Forestry at Syracuse, the University of Maine, and Yale University. Other student groups at the Forest at various times during the year were from Cornell University, Westfield State Teachers College, and from the Universities of Rhode Island, Massachusetts, and New Hampshire.

The forest economists of the Northeastern States held a two-day conference at the Forest in April. Fifteen men attended. The Friends of the Harvard Forest met for their annual Field Day on September 19. The Board of Overseers' Committee to visit the Department of Biology held a meeting at the Forest on June 18, 1965.

The State of the Forest

The Forest and forest operations: The pervasive drought which has affected much of the northeastern part of the country in the last couple of years has lowered the general water table, and undoubtedly will be registered in the growth rates of the trees. The net results probably will not be known for several years because of a time lag in the effect upon the trees, and because our plot measurements, coming at about five-year intervals, may not all be timed properly to show the effects.

Woods operations are reasonably well advanced and about 57 acres were treated with thinning and improvement cuttings. This work produced about 185 cords of fuelwood plus 21 thousand board feet of sawlogs. During the year we sold or used 236 cords of fuelwood, and sold 12 thousand board feet of sawn lumber. Road and trail improvements have been continued.

Buildings and research facilities: The year has been a difficult one financially because of unforeseen needs in building improvements and alterations. An expected cost was for exterior paint on our main buildings, and this was accomplished. Unforeseen

were complete breakdowns of a water pump in one of our dwelling houses, and the sewage disposal system in another.

A bright star in the year has been the complete reorganization of the Harvard Forest Library. This has long been needed, but has been postponed for lack of skills and funds with which to undertake it. In this year we were fortunate in having with us Mrs. Ruth Youngberg, an experienced librarian who consented to spend part of her time advising and assisting with the work. Together with Dr. Gould and Dr. Murison, and such other help as we could muster, she instituted a new classification and reshelved the entire library. The index cards are not yet completed, but they are in order and can be finished during the coming winter.

Harvard Black Rock Forest

The Harvard Black Rock Forest is owned and administered by a separate educational corporation in New York State. It is supported by funds held in trust for the purpose by the President and Fellows of Harvard College.

The Forest is under the local supervision of Mr. Jack J. Karnig, Forest Manager, although research and woods operation are planned in consultation with Harvard Forest personnel who visit the area at frequent intervals. Cutting and other woods operations are done by local contractors except for those carried out by temporary or part-time employees.

Research

Measurements and growth in residual trees in heavily thinned stands of hardwoods (Compartment IV), mentioned in earlier reports, were continued through the growing season of 1964. The study of pitch pine progenies, also mentioned earlier, was carried further by outplantings at a State Forest in New Jersey, and in another part of the Black Rock Forest. Mr. Karnig has continued his studies in the use of chemicals for control of hardwood brush and sprout growth. An important phase of these investigations pertains not only to the biological effectiveness of the methods, but also the relative costs of application at varying levels of effectiveness. Therefore time and cost records are essential. In addition to his work with chemicals on hardwoods, Mr. Karnig has effectively thinned red pine plantations at modest cost.

Buildings and Woods Operations

Early in 1965 the Forest sold a small detached property on Shore Road, in the Village of Cornwall-on-Hudson. The build-

Sutherland Pond, in the Harvard Black Rock Forest. Summer, 1965.

ing on this property, an old garage, was used as Forest Office and Laboratory from about 1940 to 1953, and since then has been used primarily for storage. The contents were moved to the Manager's residence on the Continental Road in Cornwall, where the essentials of the Office and Library are in a basement room. Other materials are stored temporarily in a garage on the Continental Road property. Plans are made for erecting a building near the Manager's residence to house the Office and Library, and also to provide living quarters for visiting students and research personnel.

General improvement and maintenance work within the Forest progressed satisfactorily during the year, especially with the help of three casual employees during the summer of 1964. Contract cutting operations yielded about 81 cords of fuelwood and about 10,200 board feet of sawtimber. The contractors also kept the roads in good condition.

HUGH M. RAUP
Director