THE HARVARD FOREST AND HARVARD BLACK ROCK FOREST
1965-66

Harvard University

Annual Report

Petersham

Massachusetts

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Harvard Forest

Staff

The staff of the Forest during the year 1965–66 consisted of the following persons: Ernest M. Gould, Jr., Forest Economist; Walter H. Lyford, Soil Scientist; Jack J. Karnig, Forest Manager for both the Harvard and Black Rock Forests; Richard A. Howard, Research Fellow, and myself. Charles F. Upham continued as Woods Superintendent, Barbara M. Kelley as Business Secretary and Librarian, Julia W. Savage as Secretarial Assistant, and Beverly Bigwood as part-time Secretary.

Dr. William F. Murison, Forest Biologist since 1959, resigned his position in August, 1965. He began teaching at Humboldt State University, Arcata, California, in the following September. Dr. Murison was not replaced during the current year, and we are now proposing to change the nature of the appointment he had, at least on an experimental basis. Dr. J. M. A. Swan has been appointed a Research Fellow for one year beginning September 1, 1966, using the salary resources formerly for Dr. Murison. Our plan is to have a series of such research fellows in the future. Dr. Swan is a forest botanist currently finishing his graduate work for the doctorate at the University of Saskatchewan, and has been highly recommended. Mr. Richard A. Howard joined the staff of the Forest in July, 1965, as a Research Fellow for a period of two years. He came to us from the U. S. Forest Service in California, and is serving as an assistant to Dr. Gould in the latter's Simulation Project. Our Secretarial staff was enlarged in November, 1965, by the coming of Miss Beverly Bigwood. Hers is a joint appointment with the Cabot Foundation.

Graduate Students, Conferences, and Visitors

As noted in previous annual reports, we attempt to keep records of people who come to the Forest for demonstration or instruction, and with whom the staff spends time periods of varying lengths. We do not attempt to keep count of the hundreds of school children who come to the Museum, or of miscellaneous Museum visitors. With respect to groups and individuals that require staff time, there were during the year 13 student groups, ranging in numbers from 8 to 40. About 13% of these students were from our own University in Cambridge, while the others were from various schools in New England and New York State. The total number of students in these groups was 276. Another category of visitors consisted mainly of groups of adults who come to view our research program, and to discuss their own projects with our staff. There were 10 of these groups, ranging in numbers from 2 to 34, and the total number of individuals was 122. In addition to these, about 30 individuals came for purposes similar to those just mentioned. The total number of people who came for instruction, demonstration, and consultation was, therefore, 428.

The 12th annual Conference on Forest Production was held at the Forest in the two-week period from October 10 to October 22. It has been our practice to restrict the membership in the Conference to 15 men, but in the autumn of 1965 the Conference was considerably oversubscribed by almost universally good prospects. This led to considerable difficulty in making choices, and we finally admitted 17 rather than 15. The Conference proved to be one of the most stimulating we have ever experienced.

A candidate for the degree of Master of Forest Science who was here last year, Mr. Thomas Yang, completed his thesis in the summer of 1965, and received his degree in February, 1966. He wished to do further graduate work in this country before returning to Taiwan, and went immediately to the forestry school of the University of Washington at Seattle. Richard Sise,

who was here in 1965–66, presented his thesis in June. Two new graduate students in forestry have been accepted for 1966–67. Mr. Jon Cassista was in residence at the Forest during the year, supported by a Maria Moors Cabot Fellowship. He is preparing his Ph.D. dissertation and expects to continue through 1966–67.

For the year 1966–67 a new fellowship was set up from the income of the Harvard Black Rock Forest Trust Fund. This fellowship will support one of the two graduate students who will be here in the coming year.

Bullard Fellows

The two Bullard Fellows who were in residence at the Forest in the year 1964–65 were Dr. Paul Richards of the University College of North Wales and Dr. Chester T. Youngberg of Oregon State University. Dr. Youngberg left in August, 1965, and Dr. Richards in September. Two Bullard Fellows were at the Forest in the year 1965–66: Dr. F. David Morgan of the Waite Agricultural Institute, Adelaide, Australia, and Dr. Robert Zahner of the School of Natural Resources at the University of Michigan, Ann Arbor. Because of a difference in his annual schedule, Dr. Morgan could not arrive until February, 1966. He will remain for one year. Dr. Zahner also came in February and will hold the fellowship for only six months. Dr. Morgan is a forest entomologist, while Dr. Zahner's interests are in the field of tree physiology and anatomy.

Research and Publications

Mr. Walter Lyford, Soil Scientist at the Forest, has continued his research on the structure, growth and development of the root systems of trees. Pursuing his earlier findings, and realizing the possibilities for the study of the growth of roots attached to mature parent trees, he and Dr. Wilson of the Cabot Foundation constructed a field laboratory in which they could bring a measure of control to the behavior of the growing roots. Most of Mr. Lyford's work has been with the roots of red maple (*Acer rubrum* L.), but during the past year he has begun an intensive

study also of the root systems of red oak (*Quercus rubra* L.). He has enlarged upon his studies of microrelief on the forest floor — its origins and significance to the distribution and growth of trees. Part of this work has been done at the Harvard Forest, and part of it in collaboration with Mr. Donald MacLean of the Forest Service of Canada in New Brunswick. During the spring term of the academic year 1965–66 Mr. Lyford gave a seminar course on soils in the Department of Geological Sciences at the University in Cambridge. He will leave in late June to spend two months in Sweden. His visit to Sweden is by invitation from the Royal College of Forestry. Swedish soil scientists wish to acquire a basis for soil classification that will be consistent with methods worked out in this country during the past few years, and Mr. Lyford will help them in this project. His expenses while he is in Sweden will be met from funds supplied there, and we are paying for his transportation to Stockholm and return.

Dr. Gould has devoted most of his research effort during the past year to the development of a new simulation study for which he received financial support from the U. S. Forest Service. The objective of his program is to develop a scheme for rating visual and other qualities of the forest landscape that affect its use for forest products and services. This system of analysis is being incorporated into a computer program that simulates the growth of a forest over time. The working model of a forest operating unit thus produced will provide information to assist in planning the allocation of resources to production of wood and to activities based on the visual quality of the forest over time. Thus it attempts to relate the traditional orientation of forest operations toward wood products with a comparatively new orientation concerned with amenity values. A forest stand simulator has been completed during the first year of the two-year program. Work in the second year will be concentrated on the use of the model as a source of information for planning a forest operating unit consisting of many stands.

Dr. Gould has three research papers now in press: one on Forest and Water System Problems; another on Forestry and the

Urban Realm; and the third, Changing Economics of the Forest Products Industries. Dr. Gould has been engaged in other activities as follows: He was Chairman of the Division of Forest Policy and Economics in the Society of American Foresters, and managed a section of the SAF meetings in Detroit on Forest Recreation Policy in the Quantico-Superior Area. Early in 1966 he acted as consultant to the Bureau of Land Management in the U. S. Department of the Interior on problems concerned with its new "Planning, Programming, and Budgeting System" of forest management. Also in the winter of 1966 he attended a conference of the National Sanitation Foundation at Ann Arbor. This conference had as its general subject "Conserving Man's Environmental Resources."

During the year I continued my Greenland research as I found time for it. This consisted mainly of the critical study of field notes made in the period 1956 to 1964, and in the preparation of papers describing it. Three of my papers have been published during the year: one, entitled "The View from John Sanderson's Farm," was printed in *Forest History*, the journal of the Forest History Society (Vol. 10, p. 2–11). This deals with the implications to be drawn from the history of land use at the Harvard Forest and in the town of Petersham. The other two papers are concerned with the Mesters Vig District in Northeast Greenland which was the scene of my research operations in that region. One is on the vascular flora of the district, and the other is on the development of turf hummocks in the vegetation of the district (Meddel. om Grønland, V.166, nos. 2 and 3). Manuscripts of two additional papers on the Greenland work are nearly complete.

Although no Harvard Forest Papers or Bulletins were printed during the year, manuscripts are now in hand for four which will go to press during the summer.

Forest Operations

Approximately 190 cords of fuelwood were used during the year, and 23 cords of slabs. This wood was burned in our own

furnaces or sold. Most of it was cut in 1964–65, but about 30 cords came from this year's operations. About 10,000 board feet of sawlogs were cut. Adding this to the inventory on hand at the beginning of the year, and subtracting the volume of sales, leaves an inventory of about 28,500 board feet as of June 30, 1966. Most of the wood, both fuelwood and sawtimber, came from a harvest cutting in Compartment VII in the Tom Swamp Tract, and from thinning and improvement cuttings in Compartments I, II and III of the Prospect Hill Tract.

The Forest continued, during the summer of 1965, to suffer from the prolonged drought which has affected southern New England and adjacent parts of New York and New Jersey. Rains in the late autumn brought some relief, and several good rains in the spring of 1966 have produced a nearly normal precipitation. Snow cover was fairly constant from late December until mid-March, so that there was very little frozen ground. Consequently the moisture from the melting snow nearly all went into the soil. The general deficit is still with us, and many reservoirs and wells continue to be low.

Buildings and Research Facilities

In previous reports I have discussed the need for additional laboratory and office space at Shaler Hall. This need has become acute in recent years due largely to the rapid expansion of the Cabot Foundation's research activities. Some consideration was given to a new wing on the building, but it has been decided to limit the expansion to what can be accomplished inside the existing walls.

A large basement room immediately beneath the present laboratory will be rearranged and equipped, and space in the basement near the mid-section of the building will be utilized for additional offices. In order to bring light, air, and easy access to the new development in the basement, the ground outside the south end of the building has been excavated to a depth equal to that of the basement floor. Windows will be enlarged, and a new door at the basement level will enter the south end of the main corridor. We

will also add a stairway from the present laboratory to the upper floor of the building. This will give ready access to the upper floor should later expansion in that direction be found necessary.

Other building maintenance and improvement activities during the year consisted of routine painting, a new water pump for supplying water to Shaler Hall and nearby buildings, and various improvements and alterations at our apartment house in the village of Petersham. In these apartments it was necessary to extend the heating system to two rooms and put in a connecting door. There has been in the south wing of this house space for an additional duplex apartment, and we are now in process of refinishing this space and supplying it with essential equipment.

Harvard Black Rock Forest

Operations at the Harvard Black Rock Forest have been much hampered during the past two to three years by uncertainties with respect to future developments there. The uncertainty began with the Consolidated Edison Company's proposal to establish a pump reservoir in the town of Cornwall. This would involve about 250 acres of Black Rock Forest land in the northeastern corner of the tract. The desirability of this portion of the Forest as a research area is not so great as other parts, and the loss of it would not irreparably affect our activities, but it would of course present problems. Considerably more important from our standpoint would be a side effect of the Consolidated Edison proposal, because the building of the reservoir would greatly decrease the local water supply to the town of Cornwall. Much of this water supply comes from the watershed of the northern half of the Black Rock Forest, and the loss of a large part of it to the proposed reservoir has tended to build up pressures in the town to increase supply from other parts of our land. Proposals have ranged from the enlargement of one of the main water supply reservoirs in the Forest to land acquisition by the town that would take most of the northern area of the Forest. If Con Ed goes forward with its program, it would assume the responsibility for the cost to the town of the replacement of its water supply. During the past year and a half some of the pressure from the town has been relieved by the drilling of large wells in the neighborhood.

More recently the town of Highlands just southeast of our Forest has been making tentative plans to enlarge its water supply by the building of a large reservoir on our land. This would be in Glycerine Hollow, a deep depression in the hills opening to the

southeast. Here the situation with respect to values we place on the land is quite different than it is in the northeast corner of the Forest. Glycerine Hollow contains some excellent stands of trees in which much silvicultural experimentation has been carried on. Also it provides a series of forest habitats which would be useful in the future not only for continuation of some of the experiments but also for the development of research in recreational use of the Forest.

A further source of uncertainty is in the deliberations of the Hudson Valley Commission, appointed to survey the use of all land adjacent to the river from Albany to New York City. This Commission has published a map showing the proposed strips of territory on either side of the river that might be reserved for park purposes, and the entire Black Rock Forest is included in it.

The general result of these uncertainties has been that we have not felt justified in beginning any research program at Black Rock that would involve time periods of more than three or four years. We are continuing to measure the growth on certain stands of timber that have been experimentally treated, and have continued our work with methods of understory control. We have also continued experimental thinnings and cleanings to establish vistas at strategic points in the Forest. We are maintaining our road system in good shape so that access to the major elements of the Forest will be available for any purpose that arises.

As I have said in previous reports, we have an acute shortage of office, library, and storage space, and no provision for anyone who wishes to come to the Forest to carry on a research project. In my report for 1964–65 I noted that plans were being made for the construction of a building that would satisfy these needs. The plans were completed in the summer of 1965, and a contract was negotiated. The uncertainties mentioned above then seemed to become concentrated, and the building was postponed.

In the spring of 1966 it was decided that no change in the status of the Forest was imminent. The Consolidated Edison Company's plans were halted by the New York courts, and its

case had to be taken back to the Federal Power Commission for further consideration. The town's success in finding other sources of water had its effect on pressures from that source. Plans being made by the town of Highlands were only in a formative stage. It was therefore thought reasonable to go ahead with the building, and ground was broken in May of 1966. The house to be built is a prefabricated structure and should be available for use by the latter part of the summer.

HUGH M. RAUP
Director