

In the last ten years the Harvard Forest, because of being the oldest forest experiment station and example of continuing intensive management in the United States, has made a greater contribution to the practice and technique of forestry than any other agency in the Northeast. This has been done directly not only through its students and publications but even more through the large numbers of professional foresters who annually visit the Forest and learn by direct observation the methods and results of controlling and improving production in existing forests. Thus the Forest itself embodies and illustrates the progress of silviculture as the years go on. As a by-product of this progress and the results of continuing records and observation as well as special research projects, new and fundamental facts have been brought out at the Forest, which are rapidly being absorbed into the practice and policy of forestry operations in the Northeast. Among the more significant are

1. That evergreen forests in certain localities definitely impoverish the soil and cannot wisely be used as repeated crops; but on the other hand, mixtures of certain hardwoods, with or without evergreens, actively improve soil conditions and maintain fertility.
2. That the highest grade timber is the product of certain favorable mixtures of species and densities of stand, both of which can be maintained or brought about by the right kind of silviculture.
3. That many of the present types of forest found in New England, although temporarily productive, are actually unnatural and transitional, due more to certain human influences, such as repeated cuttings, fires, and neglect, than to the natural factors of soil and climate; and that many of our present forests are therefore not to be taken as objectives of management.
4. That there has been convincing demonstration of methods of converting young or potentially worthless forest growth into valuable crops.
5. That the prevalence and virulence of insects and disease are powerfully affected by the composition and health of forests, and that to a useful extent these can be controlled by silviculture.

6. That a study of the relation of growth to solar radiation and varying soil nutrients, already several years in progress, indicates a more exact way of testing forest soils and connecting their improvement with changes in the composition and condition of the forest, the only practicable way to effect the equivalents of cultivation and fertilization.

7. Because of its long experience in the business management of a definite forest property as well as the technique of silviculture, the Forest staff has had much to do with the framing of state forestry legislation in Massachusetts, particularly the special forest tax law of 1921, the principle of which has been extensively copied in other states.

Although there have been many specific contributions to scientific knowledge underlying or connected with forestry, the biggest and most important services of the Harvard Forest have been the lessons from the forest itself with its records and demonstrations of successful maintenance and production; and these benefits, it cannot too often be repeated, have required time for their fruition and will inevitably show increasingly valuable and unique results in years to come.

The present program of research, which, because of lack of funds, has been only partially realized, is based upon uniform and continuing records which to a large extent embody a long time plan bearing upon both silvicultural technique, the actual handling of the forest, and of the physiological, chemical, and physical factors which are also involved. Thus there are the forest and field records covering operating figures, silvicultural plans and results, financial outcomes, progress of growth and reproduction, etc., and those records even more important and difficult to maintain, applying to weather and climatic factors, soil samples and soil analyses, measurements and observations of growth, changes in vegetation, etc. Such records are indispensable in making future interpretations significant. They form the necessary background not only to the special research projects now going on but to any and all biological investigations which deal with the reactions of vegetation or animal life to environment. The

purpose is to build up an analytical history of the environment itself so that experimental work, whether in forestry, ecology, or other biological studies, can be based upon material of known ^{origin} history. The unique value of such continuing and uniform records on the same ground is illustrated by the agricultural experimental area at Rothampstead, England, where for eighty years and under the same system, results of world wide interest have been obtained that could not have been secured in any other way.

In respect to the Harvard Forest, the period of fruition is just beginning; and though the main fruits are so far in the form of knowledge pertaining to forestry, there is accumulating a legacy of material which should be of unique value to allied biological work - genetic and ecological problems such as are now being conducted jointly with the Arboretum as well as physiological and zoological studies already being undertaken with the departments in question. There is no other such forest laboratory in the United States, and nothing like it could be created except with a similar expenditure of years and work.

In respect to funds for research and publication the Harvard Forest has had no direct contributions from the University until very lately. Since 1931 there has been an appropriation from the Department of Biology for research expenses of joint interest, amounting this year to about \$800.; and for the year 1934-35 a grant of \$1400. from the Milton Fund has been allotted to Dr. Gast for his work on radiation in relation to growth. The Forest has an endowment of \$100,000. (received in 1925) for research in forest production, the income of which has been applied \$3500. to the salary of Dr. Gast and the remainder, now amounting to a little over \$500., for laboratory assistance, materials, etc. Aside from these resources there have been irregular gifts, of which the most important was \$3000. from the Mas

the Massachusetts Society for the Promotion of Agriculture for the study of life history and succession in primeval forest. Similarly there has been no definite fund for publication, and the bulletins of the Harvard Forest, which have been published to the number of seventeen, have been paid for by private gift averaging five or six hundred dollars a year for the last decade. The salaries of the other members of the staff (aside from the Director), namely, Assistant Director and Instructor, are paid very inadequately from an additional endowment of \$200,000. obtained in 1929-30. There is thus a total endowment belonging to the Forest, and exclusive of the so-called Bliss Fund for scholarships, of a little over \$300,000. The income of this covers ^{these} salaries and, at the present income rate, about \$2000. for house maintenance, equipment, materials, and assistance. The net income from the sales of the Forest, up to 1932, from \$1200. to \$2000., has been wholly spent for maintenance of plant and upkeep at Petersham with an occasional small surplus for experimentation or improvement in the forest. There has been no net income during the last two years. Thus, during the best times there was available for the various purposes of research a sum ranging from four to five thousand dollars annually. Under the present conditions of reduced income from the Forest and its endowments, the amount available is less than three thousand, which is not sufficient to meet necessary running expenses, even though the latter have been reduced nearly forty per cent in the last two years.

The Forest needs more funds to raise the salaries of its staff, ^{is to} for assistance in maintaining indispensable records, observations and analyses, and for incidental expenses of upkeep, equipment, and materials of research. The present staff has to handle with inadequate aid in routine matters the following work:

1. Administration.

The business of an organized forest:

Planning and marking cuttings; logging; sawmill operations; sales and deliveries; ~~necessary~~ work and planting; forest improvement; road maintenance; fire protection; accounts and bookkeeping.

Departmental and faculty relations

2. Public Relations

Dealing with several hundred visitors *annually,*

Consultation on state and federal forest policies

Technical advice to ^{the} town and local owners. *work on committees, advisory boards, associations;*
Lectures

3. Records

The necessary annual measurements, observations, *serial* photographs, computations, maps, dealing with operating costs, ~~details of~~

Details of cuttings,

Plantations and other silvicultural work as well as physical and chemical data relating to soils, climate and weather, and necessary biological data.

4. Teaching and Research.

The supervision of graduate students working on special projects or in collaboration on projects by members of the staff.

This combines *studies* oversight of many continuing experiments and sample plots on the Forest itself with current specific problems, and includes preparation of results for publication.

Not to maintain this program of work and to take care of the inevitable expansion of recorded material is to lose the value of twenty-five years of work that has not been duplicated anywhere else in the country. Moreover, the present federal program with respect to conservation, involving as it does the fundamental economic puzzle of land use - what to do with sub-marginal lands proposed to be withdrawn from production, water supply and flood control, soil degradation,

compulsory silviculture, ^{and} timber quotas for lumber operators, in all
 of which the forest, ^{then} both in its economic and physiological functions
 is the controlling element, indicates the need in the University of
 new integrations and cross sections of research. In this direction
 two types of professorship are suggested, both of which would provide
 such an realignment of purpose. One may be called a professorship of
 natural resources, which would deal with forests as a part of the
 question of national land use in terms of economics and forestry interests.
 Another professorship, which would give new life and meaning to bio-
 logical study ^{to deal with} and the significance to man of living environment, ~~as a~~
~~whole,~~ ^{is} would be a professorship of ecological or forest physiology.
 So far there has been little attempt by the biological sciences to
 integrate and interpret as a whole such functions of the forest and
 other natural environments as touch the life of man. This would give

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~~whole,~~ ^{is} would be a professorship of ecological or forest physiology.

This would give
 new life and meaning to biological study.