



Annual Report 1947-1948

TO THE PRESIDENT OF THE UNIVERSITY:

SIR,

During the past year special efforts have been made to improve the grounds and rearrange the plantings at the Arnold Arboretum so that they can be maintained with a minimum of hand labor. Labor costs have doubled since 1942. Less labor was used on the grounds than during the previous year, but mechanized equipment has made the labor more effective.

Ten tons of fertilizer and several tons of lime were applied to various collections, particularly the elms, lilacs, rhododendrons, maples and viburnums. The response of the trees and shrubs justifies the fertilizer application.

The "Blitzer" mower, drawn by a tractor, has proved to be a major factor in keeping the grounds neat, and in reducing fire hazards. The improvement is especially striking in the Conifer Collection.

The mulching of the trees and shrubs with spent hops from a local brewery has been very effective in promoting growth and reducing weeds. Last winter we obtained 2,824 cubic yards of peat moss at a cost of \$882.00. Much of it was distributed along Meadow Road where we are to plant an azalea collection, some was used in the **Shrub Collection** and a considerable stock pile has been accumulated. Peat moss is now used in practically all new plantings.

Many of the plants in the Shrub Collection have been re-arranged, and eventually we plan to move the vines to the wall along the Arborway. The shrubby Cornus were moved to the **Bussey Hill** area. The best of the Deutzias, Spiraeas and Weigalas have been moved to the Shrub Collection **and the rest moved to Weston.**

Mr. John S. Ames contributed \$3000 to be used specifically for **the renovation of Peter's Hill**, an area long neglected due to lack of labor. Work was started in June, and we expect to complete the removal of dead and surplus trees by fall so that the area can be seeded to grass and new plantings started as soon as possible.

A collection of 36 color prints was made and displayed at the Spring Flower Show. Both color and black and white photographs have been made for projection and publication. Our

horticulturist has given 15 lectures during the year, largely to garden club groups. The usual numbers of *Arnoldia*, our journal of popular information, have been issued.

The assistant horticulturist spends most of his time checking the names of plants removed from or added to the collections, so that our records are always up to date. During the year, 4,173 display labels and 1,246 record labels were made.

We received 1,087 cuttings or scions, 974 packages of seed and 86 plants during the year. Our propagator grew 60 flats of seedlings, rooted 652 cuttings and made 2,290 grafts. He distributed 317 cuttings, 695 packages of seeds and 459 plants. In addition, a total of 532 packets of *Metasequoia* seeds, which were sent to Dr. Merrill from China, have been distributed over a wide area.

The Case Estates in Weston have proved to be of great value in the Arboretum work. The nurseries now include 1,600 kinds of plants. Many of the less ornamental shrubs are in a permanent planting and consist of 418 species and varieties. The hybrid seedlings developed at the Arnold Arboretum are tested at Weston. Approximately seven acres of land are used for tree-breeding test plots and half an acre of hybrid corn was grown for the Bussey Institution. The Department of Landscape Architecture is slowly developing its project and the Weston Garden Club assists with the perennial garden and in return obtains cut flowers for its work in local hospitals. Several horticultural experiments are being conducted on this land.

A new hybrid cherry has been distributed to cooperating nurserymen. This hybrid is a semi-double flowered dwarf plant which retains its flowers for a long period. It has been named "Hally Jolivette," the maiden name of the wife of the plant breeder. Several apple hybrids have been distributed for testing, but have not yet been named. Some of the new *Forsythia* hybrids show much promise. Root stock studies are being continued to discover dwarfing stocks for both ornamental and commercial trees and shrubs. Cytological studies have been largely confined to work with x-rays.

Professor Bailey and his co-workers have continued their investigation of the comparative morphology of various dicotyledonous families with special emphasis upon the structure of carpels and stamens, nodal anatomy and pollen morphology. A wealth of carefully preserved material, collected by Dr. A. C. Smith in Fiji, has enabled Dr. B. G. L. Swamy to complete a very thorough and significant study of the *Degeneriaceae*. Mr. J. E. Canright is completing a comprehensive study of the *Magnoliaceae*, Mr. R. W. Vanderwyk of the *Annonaceae* and Mrs. Lillian N. Money of the *Monimiaceae*. Mr. Armando T. Hunziker, a Research Fellow from Argentina, is initiating an investigation of the *Lardizabalaceae*. Two observations of particular significance have been: (1) that the New Caledonian endemic, *Amborella tricopoda* Baill., is a new morphological type of vesselless dicotyledon, and (2) that the wood of the much discussed "*Metasequoia*" contains traumatic resin canals indicative of relationship to *Sequoia* rather than to *Taxodium* or other genera of the *Taxodiaceae*.

During the year 9,395 specimens were mounted, of which 8,480 were added to the herbarium, which now contains 634,487 specimens. Accessions during the past fiscal year numbered 59,955 specimens, of which only 12,112 came through exchange, the greater part coming from subsidized exploration and work of our staff. Some of the more important

exchanges consist of 4,803 specimens from the Natural History Museum, Paris (material from southeastern Asia, New Caledonia, and western Africa), 1,657 from the Botanic Garden, Singapore (material from Malay), and over 1,200 specimens from the Botanical Museum, Leiden (material from Siam). Our largest accession is the work of a staff member, the 26,000 specimens assembled by Dr. A. C. Smith during his nine months of field work in Fiji. As results of subsidies given to Chinese botanists in previous years, over 15,000 Chinese specimens were received from the National Szechuan University, over 2,400 from the Yunnan Botanical Institute, and a smaller number from Nanking National Central University. Of special interest among these latter collections is material of recently discovered living plants previously known only as fossils. As a result of our close cooperation with Chinese botanists the Arboretum was able to acquire seeds of the *Metasequoia* and make the first general distribution of them to botanic gardens and horticulturists in America and Europe.

A total of 14,658 specimens was sent out from the herbarium, most of which (907 unmounted and 10,972 mounted) represent continuation of inter-institutional transfer of American tropical material to the Gray Herbarium in Cambridge.

The Arboretum has received 39 requests for the loan of herbarium material. These came from 12 American and nine foreign institutions and involved 3,902 of our specimens. For the study of our own staff, 2,274 specimens were borrowed from six American and six foreign institutions.

Professor Rehder has continued work on the bibliography and synonymy of American cultivated trees and shrubs. The large volume, now mostly printed, will probably appear next year. Dr. Merrill has finished his detailed study of the botanical works of Rafinesque and sent his bulky manuscript to the printer. He sailed for Europe on May 15 to attend the symposium on botanical nomenclature held at Utrecht, Holland, being one of three delegates representing the United States. Having three weeks in England and three in Holland, he was able to accomplish considerable botanical work in the major herbaria at London, Kew, and Leiden. Dr. Johnston finished a report on some of his botanical work done in Panama during the recent war and has resumed work on the West Indian and Central American Boraginaceae, preparatory to writing an account of the family for the Flora of Trinidad. Dr. Smith, absent during a year of field work in Fiji, returned to the Arboretum in March and began organizing his extensive collections for study. Dr. Kobuski furthered his studies of the Theaceae. In addition to his other duties he assumed rather heavy editorial duties during Dr. Smith's absence. Dr. Caroline Allen finished her very detailed and critical account of the Panamanian Lauraceae and worked on representatives of the family from northern South America. Dr. Perry continued work on the Papuan flora and started studies on the Chinese flora. Dr. Frans Verdoorn continued to edit his *Chronica Botanica*, "A New Series of Plant Science Books," and the *Annales Cryptogamici et Phytopathologici*, and established a new serial, *Pallas*, for the publication of reprint editions of rare classic scientific works. Volume 1 of *Biologia*, a report of international activities in the biological sciences, was concluded in December, 1947. Volume 2 will be issued this autumn as a

small annual. Work on the Index Botanicorum continued, as in previous years, with two administrative assistants devoting almost full time to this work. The card files, needed before the actual compilation of the Prodrromus to the Index can be started, are now nearing completion.

During the fiscal year just ended, about ninety per cent of the preLinnaean books were sent to the Houghton Library on temporary deposit (until such time as we shall have better facilities for their storage). The present library space available here for these books is not the best. The upper library gets too hot in summer and too cold in winter, and as a result the old leather bindings suffer greatly. If any of these books are urgently needed, it is a matter of from twenty-four to thirty-six hours for the Harvard messenger to bring the books over from Cambridge. These books are shelved as a unit, in the same order in which they were shelved at the Arboretum. The remaining ten per cent area "must"; they are needed here. The latter have been treated with a leather preservant, and those in need of repair have been repaired and restored by a craftsman. The resulting empty shelves have enabled the librarian to remedy the overcrowding of other shelves, namely those containing monographs; a job of shelf-reading and dusting accompanied the moving. There has been some re-arrangement of books in the main library. In several sections the books have been given individual numbers, thus making the finding of references much easier for the staff.

We continue to fill the gaps in foreign periodical literature, German as well as Japanese; some through journal exchanges, some through the Library of Congress Mission. We were very fortunate in receiving microfilms of several German periodicals, the originals of which were destroyed during the war.

Interlibrary loans were heavier than in previous years, 685 volumes having been borrowed or loaned; there were also many requests for typed copies of original descriptions, microfilms, and photostats.

The photograph file is being brought up to date, especially that section which deals with the Arnold Arboretum.

There were 248 bound volumes added to the library, bringing the total to 46,765; 185 pamphlets were catalogued and put into pamphlet bindings, and these now total 14,148.

The main catalogue received additions of 825 cards, and the Gray Herbarium cards were increased by 4,629.

A new steel file was acquired for the slips of the Polynesian bibliography.

Endowment funds received during the year included \$360,000.00 from the Louisa W. Case estate, \$64,790.91 from the Georgiana Wells Sargent bequest, and \$10,000.00 from the William Prescott Wolcott bequest. Funds for current use include \$3,000.00 from John S. Ames for the specific project already described, \$400.00 for Chinese exploration, \$50.00 for the

William H. Judd Fund, \$6,680.00 for the Refined Publication Fund, and \$8,583.65 from the "Friends of the Arnold Arboretum" for improvement of the grounds.

The total income for the year was \$170,134.00 and expenses were \$172,428.00. The deficit was greater than indicated because the publication fund and the grant for special work on Peter's Hill are to be expended largely during the following year. The deficit during the past three years has amounted to more than \$30,000.00, and has practically wiped out the credit balance built up during the war years. The added endowment and contributions from the Friends of the Arnold Arboretum should permit normal maintenance and operations during the coming year. However, we have not replaced the plant pathologist who retired in 1940, nor the two taxonomists, an assistant librarian and a technician, who retired or resigned last year.

KARL SAX, Director