



## Annual Report 1964-1965

TO THE PROVOST OF THE UNIVERSITY:

SIR,

The Arnold Arboretum was twice honored during the year: by the Massachusetts Horticultural Society and by the United States Department of the Interior. The trustees of the Massachusetts Horticultural Society voted in November to award the large Gold Medal of the Society to the Arnold Arboretum for its horticultural leadership.

In January the Secretary of the Interior, Stewart L. Udall, announced that the Arnold Arboretum had been designated for recognition as a National Historic Landmark. The nomination citation read, "As well as being a beautiful park, the Arnold Arboretum is now America's pre-eminent institution for research in woody plants." The award was jointly accepted by Mayor John F. Collins for the City of Boston, as owner of the land; by Commissioner William J. Devine, for the Department of Parks and Recreation, for its maintenance service of portions of the property; and by Mr. Nathan M. Pusey, for the President and Fellows of Harvard College, trustee of the Arboretum and responsible for its staff, collections, and research contributions.

### STAFF

It is with deep regret that we report the deaths of [Mrs. Susan Delano McKelvey](#) on July 11, 1964 and of Mrs. Dorothy H. Marsh on April 13, 1965. Mrs. McKelvey's long service to the Arnold Arboretum began under the tutelage of Charles Sargent and included scientific and horticultural contributions through her publications, as well as support in her association with the staff and the Board of Overseers' committee to visit the Arnold Arboretum. Mrs. Marsh worked as an artist on the project concerned with the Generic Flora of the Southeastern United States. Her drawings add measurably to the value of this research project.

The appointment of Dr. Lorin I. Nevling, Jr., as Associate Curator, without limit of time, was approved during the year. Dr. Nevling serves as Supervisor of the Herbarium of the Arnold Arboretum and Supervisor of the Herbarium of the Gray Herbarium on joint and simultaneous appointments.

New appointments during the year were made to Dr. Thomas Gordon Hartley for work on the floras of Southeastern Asia, to Dr. Ian Keith Ferguson for work on the flora of the

Southeastern United States, and to Mr. Henry Barnes Hosmer in support of his interest in plant introduction from Afghanistan.

Mercer Research Fellowships were awarded during the year to six scholars whose work would be aided by access to the collections of the Arnold Arboretum. The recipients were: Mr. Arturo Gomez Pompa, of the National University of Mexico and of its botanical garden, for work on the vegetation of Vera Cruz, Mexico; Dr. Hermanus Philippus van der Schijff of the University of Pretoria, Republic of South Africa, in areas of wood anatomy; Dr. Hans U. Stauffer of the University of Zurich, to study materials of the Santalaceae; Dr. H. Christian Friedrich of the University of Munich, to examine materials of the Aizoaceae; Mr. Edward A. Murray, as a graduate student of Pennsylvania State University, for the study of Acer; and Mr. Michel Colon, from the Royal School of Horticulture at Vilvorde, Belgium, for a study of the horticultural activities of the Arboretum staff.

Honors and assignments came to various members of the staff. [Mr. Alfred Fordham](#) was appointed to the research committee of the Massachusetts Nurserymen's Association and to the cultivar testing committee of the International Plant Propagators Society. Mr. Peter Green was elected secretary of the International Association of Botanic Gardens.

Dr. Richard Howard was appointed to the board of the Division of Botany of the International Union of Biological Sciences. He is a member of the board of the International Association of Botanical Gardens and a council member of the Association for Tropical Biology.

[Dr. Karl Sax](#), Professor Emeritus, was awarded an honorary degree of Doctor of Science from the University of Massachusetts. Dr. Bernice Schubert was appointed to the editorial board of the Bulletin of the Association for Tropical Biology. Dr. Carroll Wood was reappointed to the subcommittee for family names of the Committee of Spermatophyta for plant nomenclature established by the International Botanical Congress. [Dr. Donald Wyman](#) was elected president of the Horticultural Club of Boston. He is a member of the organizing committee for the XVII International Horticultural Congress scheduled for the United States in 1966. During the year Dr. Wyman was honored three times for his horticultural writings: by the International Shade Tree Conference, by the National Council of State Garden Clubs, and by the Garden Club of America.

## HORTICULTURE

The successful growing of plants in Jamaica Plain is becoming dependent on an apparently decreasing summer rainfall. Although mention has been made of the drought conditions in previous reports, the cumulative effect of successive summers deficient in rainfall is now conspicuous and serious. Three of the first four months of the calendar year 1964 exceeded the expected or mean rainfall by 10 per cent, but seven of the following eight months were deficient. Summer months, which should have averaged 13.36 inches of rainfall, produced only 5.95 inches. In fact, water was carried continuously in tank carts between June and November.

During the dry spells several severe fires were caused by carelessness and vandalism. The planting programs have been restricted to areas easily reached with water. Death of plants due to the dryness has increased, and the work of the pruners has nearly doubled.

The Department of Parks has been asked to consider extending water mains in the Arboretum grounds, and the Arboretum staff is investigating the possibility of wells as a supplementary source of water. The flowering season of spring 1965 was outstanding for crabapples, lilacs, and rhododendrons but much below average for cherries, azaleas and dogwoods. The public attendance, visitors and participants in tours and classes open to the public, was higher than usual.

The Department of Parks and Recreation of the City of Boston completed the roadway to the top of Peters Hill during the early summer. A renewed and joint effort has been made to obtain a small plot of land and the former roadway along Centre Street in order to incorporate this area with the Arboretum.

During the spring months Mr. Seth Kelsey was retained as a landscape consultant in connection with certain problems and problem areas within the Arboretum. In accordance with his suggestions, preliminary work is under way on some areas of the grounds. In the vicinity of the greenhouses we have established two new beds as a temporary location for the genetic dwarf conifers. Additional espaliered plants have been established along the chain-link fence bordering Centre Street. Activities in the Arboretum greenhouses include the receipt and distribution of plant materials, the maintenance and service of teaching and research collections, and a program of teaching and educational activities.

During the year the Arboretum staff received 288 shipments of plant materials: seeds, plants, or plant parts, comprising 1,482 units from thirty-nine countries. To fill requests and to distribute our own introductions, we sent out 294 shipments of 1,314 units to seventeen countries. Much of the material received was selected by [Dr. Wyman](#) during a trip through Europe in the spring of 1965. The full amount of the material being thus introduced will become more evident during the next year, yet the taxa already received suggest that this will prove to be one of the major recent horticultural efforts in plant introduction by the Arboretum.

Within the United States, cooperative programs in plant propagation, hardiness, and evaluation are conducted with many other gardens, universities, and several branches of the United States government. A newly organized cooperative program in Puerto Rico has enabled us to extend the distribution of temperate and tropical materials received by the staff for study. Surplus plants from the nursery area were again offered to the University, and a large number were selected for planting around new buildings in Cambridge and in related facilities.

Mention should be made of increasing activities in the area of horticultural plant taxonomy. Additions to the horticultural herbarium approached 5,000 specimens this year, representing plants under cultivation in Australia, Bermuda, Brazil, England, Iraq, Puerto Rico, Switzerland, Trinidad, and many locations in the United States. Special studies in Alyssum and

its relatives, Jasminum, Lonicera, Lantana, Weigela, and Sambucus, involve taxonomic revisions or the preparation of cultivar registration lists.

The Case Estates occupy a conspicuous position in the geographic center of Weston and play an important role in the work of the Arnold Arboretum. In recognition of the need for understanding by the town of our activities, classes, tours, and open houses are held on the property. During the year a leaflet was prepared, which with arrows and numbers serves as a self-guide for a tour of the Case Estates. Display collections already established were supplemented during the year, and a new collection of Hosta varieties was planted.

For the first time in a number of years the Arboretum did not participate in the Spring Flower Show of the Massachusetts Horticultural Society. Impending changes in the physical plant necessitated a commitment of labor, and the requirements of greenhouse space for research materials and experiments in progress did not permit the forcing of trees and shrubs in time for the Spring Show. A demonstration of mulching materials similar to that shown at the Massachusetts Spring Flower Show last year was exhibited for the American Horticultural Congress in New York.

Mr. Heman Howard prepared a special set of display photographs of the [Larz Anderson collection of bonsai](#) of the Arnold Arboretum. The set, showing individual specimens as well as methods of housing the bonsai, is available on loan.

#### HERBARIUM

Considerable progress was made in curatorial work involving the herbarium quarters, the insertion of mounted materials, and the organization of unidentified collections formerly in storage. The fourth floor of the Administration Building in Jamaica Plain, which is used for the storage of herbarium collections, was cleaned and painted; the collections on the third floor were reorganized preparatory to mounting or, in some cases, to distribution. Work continues on the organization of the cultivated plant specimens into geographical areas where they are grown, on the recognition and marking of type specimens, and on the annotation of specimens representing taxa considered in recently published monographs.

During the year 20,395 specimens were mounted and added to the herbarium collections, bringing the total number of sheets in the Herbarium to 806,279. The staff members and their students requested or received for identification 4,317 herbarium sheets representing ninety-five loans from thirty-six institutions. The staff filled loans requests for 138 loans to 72 institutions and sent out 14,713 sheets.

The taxonomic research of the staff is based on herbarium specimens supported and supplemented by information acquired during field work and in areas of cytological and morphological studies. The interest is world-wide and involves many families of flowering plants in floristic, horticultural, and monographic studies. The project concerning the

preparation of a generic flora of the Southeastern states is headed by Dr. Carroll Wood, whose staff includes Dr. George Brizicky and Dr. Ian Ferguson.

Treatments of seven families were published during the year in the [Journal of the Arnold Arboretum](#). Dr. Richard Howard maintains a research and field program in the Caribbean islands. During the year large unidentified collections from the West Indies, many made over a century ago, were received from the Museum National d'Histoire Naturelle, in Paris, for study and determination. Recent collections were received from Puerto Rico, Bermuda, Tortola, and Virgin Gorda from active resident collaborators.

The interest of the Arboretum staff in the floras of Asia was exemplified by the work of four staff members. Dr. Thomas Hartley continued identification of his own collections from Papua and New Guinea and his monographic interest in *Zanthoxylum*. Mr. Peter Green continued his study of his collections made last year on a trip to New Caledonia, Lord Howe, and Norfolk Island. Dr. Lily Perry, although officially retired, has turned her attention to the Arboretum collections of [Dr. Leonard Brass](#), made on recent trips to New Guinea. Dr. Shiu Ying Hu continues her study of Asiatic hollies and has completed a bibliographic study of the Compositae of China.

Mediterranean floras are the current interest of Dr. Theodore Dudley in his work on *Alyssum* and its relatives in special treatments prepared for floras of Turkey and of Iran. Drs. Bernice Schubert, Lorin Nevling, and Carroll Wood maintain research programs involving families of plants predominant in South America, but significant as well for horticultural interest. These include the Begoniaceae, Dioscoreaceae, Thymelaeaceae, Chloranthaceae, and Leguminosae. We are pleased to have had many visitors who examined material in their special groups for varying periods of time.

These studies involved not only the herbarium and library, but also the special collections of fruit, wood, pollen, and the living collections in Jamaica Plain and Weston. Visitors of note studied the material of *Agave* built up by [Mrs. Susan McKelvey](#) in the course of her work on *Yucca*; the many types of material of the pear, *Pyrus*; the difficult family Santalaceae, of which representatives were found unidentified in seven other families in the herbarium; and most helpful annotations were placed in the herbarium by these and other visiting specialists. The only unhappy note to the continued use and development of the herbarium of the Arnold Arboretum is the fact that areas of cases in the herbarium in Cambridge are being filled to capacity. Plans must be made soon for an expansion in the number of available cases if the specimens are to remain housed properly and handled with ease.

#### LIBRARY

Much of the activity of the Library staff during the year concerned the organization and evaluation of material received as bequests and gifts, and of old collections needing additional work. Mrs. Susan McKelvey, who knew our Library as well as any individual could, enriched it still further by leaving 280 of her books to be added to our collections. Her earlier gifts of

supporting materials to her work on lilacs, yucca, and the Trans Mississippi West have been acknowledged in previous reports. Mr. Seth Kelsey, a friend of the Arboretum and a member of the Committee to Visit the Arnold Arboretum, was forced to dispose of records of his father, the late Harlan P. Kelsey. Since much of this material concerns the development of horticulture in New England, the staff of the Arboretum has accepted this collection for study and organization prior to appropriate disposition of parts of the material on national, city planning, standardized plant names, the American Horticultural Society, and the Arnold Arboretum. Of particular value and interest to the Arnold Arboretum will be the extensive correspondence of Mr. Kelsey with Charles Sargent, E.H. Wilson, and other members of the staff.

Considerable effort has been devoted to reorganizing the reprint collection of the late Professor J. H. Faull. Many of these prints concerned with forest plant pathology, accumulated while Professor Faull was on the staff of the University of Toronto, were offered to the Shade Tree Research Laboratory at the University of Toronto.

[Miss Stephanie Sutton](#) has undertaken the task of organizing the material and correspondence concerning the history of the Arnold Arboretum. During the year, 647 bound volumes were added to the Library, bringing the total of books to 52,864 volumes. Reprints and pamphlets numbering 450 were added, making a total of 20,274 items so catalogued. The usual additions were made to regular index series of value to the staff.

#### COMPARATIVE MORPHOLOGY

Professor Bailey is continuing his investigations on the primitive leaf bearing Cactaceae under an extension of his grant from the National Science Foundation. Professor van der Schijff, as a Mercer Research Fellow, has been working in our laboratory studying the unusual growth characteristics and subterranean stem development in many Leguminosae from arid regions of South Africa. Dr. Howard has continued his studies of nodal and petiolar anatomy, with attention devoted to securing information concerning families of plants not well represented in the available flora.

#### CYTOLOGY AND GENETICS

Dr. Sanders has continued her studies of the cytology of various colchicine treated lines of Sorghum. In cooperation with members of the taxonomic staff, Dr. Sanders has checked the chromosome configuration and count of many of the plants of research projects in the greenhouses. Mrs. Rudenberg has continued her cytological studies of taxa of Lonicera in a systematic examination of plants in the living collections of the Arboretum. Dr. Nevling has obtained information on the chromosome cytology of several tropical species important to work in progress in Puerto Rico.

#### EDUCATION

Two formal courses in Harvard College were offered by members of the Arboretum staff during the year. Dr. Howard taught a new course, Biology 209, the Phylogeny of the Flowering Plants.

During the mid-semester vacation this class traveled to a field location in Puerto Rico and with the assistance of Dr. Wood spent a week in closer examination of many families limited to the tropics. In the spring semester Dr. Wood and Mr. Green taught Biology 103, an introductory course: The Taxonomy of Vascular Plants. A special financial arrangement was made with the Department of Biology permitting this cooperative effort. Graduate students, undergraduates, special students, and Mercer Fellows worked with several staff members for guidance in their development of special problems in taxonomy or in horticulture.

Most of the staff attended and participated in the seminar series on plant taxonomy held in the Harvard University Herbarium Building. Informal classes offered without academic credit to the general public were conducted in the fall and in the spring, both in Jamaica Plain and in Weston. Several special educational programs were arranged to meet specific requests: for the Massachusetts Horticultural Society, the Massachusetts Department of Education, the Massachusetts Department of Agriculture, and the Boston Public Schools. Open houses were held in Jamaica Plain and in Weston.

#### TRAVEL AND EXPLORATION

The X International Botanical Congress was held in Scotland; six members of the Arboretum staff attended and also participated in the pre-Congress sessions devoted to nomenclature. The Congress also afforded the opportunity to visit other botanical gardens, universities, and herbaria, as well as the informal conferences and meetings which form such an important part of international gatherings. Members of the staff took the occasion to travel in other countries and to gather information pertinent to various studies in progress at the Arboretum.

During the spring of 1965 [Dr. Wyman](#) spent several months in Europe to obtain plants thought to be new to the United States as well as being hardy out-of-doors at the Arnold Arboretum. These plants have been sought from native floras, as well as in cultivated and introduced collections in botanic gardens, arboreta, private gardens, and commercial nurseries.

Mr. Hosmer, research associate, was able to collect material of plants worthy of trial in the Boston area in several locations in Afghanistan. Drs. Howard, Nevling, and Wood made trips to Puerto Rico in programs of teaching and research. In addition to the travels of our own staff, the Arboretum has been able to share the field expense of botanical work from other institutions, and then the results of that work in herbarium collections, seeds, and plants. During the year support was afforded expeditions in Turkey, Guatemala, Puerto Rico, South Africa, and Western Australia.

#### GIFTS AND GRANTS

During the fiscal year 1963-64 property belonging to the [Bussey Institution](#) was taken by the Commonwealth of Massachusetts by right of eminent domain. On this property were the old buildings forming the greenhouse complex of the Arnold Arboretum. The value of the buildings alone was credited to the Arboretum shortly before June 30, 1964, when the sum of \$14,806.69

was added to the principle of the Bussey Fund for the Arnold Arboretum (1903) for that portion of the net proceeds of the Bussey Institution land settlement.

The Friends of the Arnold Arboretum renewed their gifts during the year, and these funds were assigned as usual to an account for work on the grounds in Jamaica Plain and for horticultural activities and the greenhouses.

Gifts of plant materials have been received from many sources for research, teaching, or experimental programs, or for incorporation in many of the collections. Gifts of books, photographs, and horticultural records were also many during the year. We are grateful for them and the interest in our activities that they represent.

#### PUBLICATIONS

Four numbers of the [\*Journal of the Arnold Arboretum\*](#) were issued under the editorial direction of Dr. Schubert, and *Arnoldia* was issued at irregular intervals, edited by Dr. Wyman and Mr. Green. Since volumes 1-10 of the *Journal of the Arnold Arboretum* have long been out of print, and the supply of many single numbers has been exhausted, the available back numbers were sold during the year to the Kraus Reprint Corporation, New York, under a contract to reprint the first twenty volumes and all out of print numbers and to offer all for sale.

During the year the staff published seventy-six articles and books. A complete bibliography of staff publications and additional data on the activities of the Arnold Arboretum staff is included in the October number of the *Journal of the Arnold Arboretum*.

RICHARD A. HOWARD, Director