



Annual Report 1976-1977

TO THE PROVOST OF THE UNIVERSITY:

SIR,

The dictionary definition of an arboretum as a place where trees and shrubs are cultivated for scientific or educational purposes is an inadequate description of the Arnold Arboretum today. While neither the largest nor the smallest of America's botanical gardens and arboreta, the Arnold Arboretum is among the most active in the use of its collections for science and education. The living collections have been designated a National Historic Landmark; and the herbarium, a National Scientific Resource.

The use of the collections is not limited to the staff--the general public finds the Arnold Arboretum a pleasant place to visit; and as a source of information for education, science and industry, the staff handles requests and visitors from many states and foreign countries.

The Arnold Arboretum functions in three areas, Jamaica Plain, Weston, and Cambridge, with staff members in each area. Most of the land in Jamaica Plain is owned by the City of Boston, and used by the Arboretum for a token rental fee on a long-term agreement. As the Arboretum is considered a part of the [Boston Department of Parks and Recreation](#), the City is supposed to maintain the roads, fences, and benches, and to offer police protection. The Arboretum staff and funds maintain the collections, with the agreement that they be open to the public at reasonable hours.

The Arnold Arboretum is considered a charitable trust administered by Harvard University as a department. Neither the City of Boston nor Harvard contributes directly to the financing of its operation. Accounting procedures and benefit programs are those of the University, for which the Arboretum funds are assessed. Staff members may have academic or nonacademic appointments, and the grounds staff is represented by a union. The complexity of these interrelationships is evident in many items of this report.

A grant from the National Science Foundation for the past three years has supported curatorial work in the herbarium and library in Cambridge. None of the money could be used for horticulture or for the care of the living collections. In an application for a renewal of this grant, information was requested and supplied on the number of professional visitors who used the herbarium or the library. Their location in a closed building permitted the tabulation of use

of the collections by means of a guest book with visitors' signatures. The living collections in Jamaica Plain are partially surrounded by a fence. However, the gates are not operable and the general regulations of being open sunrise to sunset cannot be enforced. With 265 acres and many gates, no accurate count of the visitors is possible.

The Case Estates of the Arnold Arboretum in Weston are not fenced at all, and a visitor record is impossible to acquire. We have police department estimates of fifty to sixty thousand people in Jamaica Plain for a fine Sunday in May when the lilacs are in bloom. Parking of cars around the periphery of the Arboretum is a problem on such days. Although no reliable figures are available for the total number of visitors in the course of the year, it seems likely that sixty per cent of them visit the grounds during May when most of the shrubs are in flower.

With the aid of volunteers this spring, a questionnaire was compiled and visitors were interviewed to determine who they were, where they came from, and why they were here. A random sample of three hundred revealed fifty-one per cent female and forty-nine per cent male visitors, twenty-three per cent alone, thirty three per cent with friends, thirty-nine per cent with family, and five per cent as part of an organized group.

Daily visitors numbered ten per cent; twenty-five percent came once or twice a week; twenty per cent, once a year. The largest age group was eighteen to thirty four, representing fifty-five per cent of the visitors interviewed. Towns inside Route 128 produced sixty four percent of the visitors, with twenty-two percent from Jamaica Plain and eighteen per cent from Boston. Visitors from out of the state were twenty per cent of the total and included some from twenty-four states besides Massachusetts.

Newspaper publicity and radio or TV announcements accounted for only six per cent of the visitors. When asked about the labels, ninety two percent of the visitors responded that they looked for and read the labels on the plants. The information they found was useful to eighty-six per cent and only twenty-eight per cent wished for more information; yet forty per cent reported they came to the Arboretum, in part at least, to learn more about plants. Every visitor interviewed responded to a question concerning the problems at the Arboretum, which were listed in order: litter, vandalized labels and plants, dogs, bicycles, and skateboards. It is of interest to the staff that eighty per cent of the visitors indicated they would pay a nominal entrance fee to visit the grounds. Much of this information and additional items elicited by the questionnaire will be used in developing methods of operation and education programs.

STAFF

Several University departments and special committees were active during the year, considering the larger problems of employment at Harvard. Arboretum staff members received questionnaires relating to their job classification and compensation. Recommendations received subsequently from the Personnel Office were implemented, with changes of job title, level of classification, and increases in salary rate.

June 30 marked the retirement of [Mr. Alfred Fordham](#), who joined the staff on February 1, 1929, as assistant in the propagating department, and served for many years as the plant propagator for the Arnold Arboretum. As an expert propagator of plants for our collections, Mr. Fordham handled equally well a role as a lecturer, writer, and talented representative of the Arboretum to the horticultural profession.

Resignations were received from Dr. Kenneth Robertson of the Generic Flora of the Southeastern United States project; Mrs. Jackie Smith and Mrs. Marsha Knoll of the herbarium staff; Miss Rebecca Rohr, Miss Nancy Karasik, and Mr. Patrick Pancoast from the library; and *Journal* technical editor Miss Kathleen Clagett. New employees included Mr. Kenneth Shaw as assistant supervisor of the living collections, and Ms. Betsy Schmidt as assistant editor of the [Journal of the Arnold Arboretum](#).

Dr. Peter Stevens received an academic appointment for three and a half years as assistant professor of biology in addition to his curatorial appointment. Dr. Stephen Sponberg and Dr. Richard Weaver were given appointments of unspecified duration as horticultural taxonomists at the Arnold Arboretum. Mrs. Ida Burch was reclassified as a staff assistant.

Dr. Bernice Schubert and Mr. Michael Canoso were recognized by the University in a special ceremony honoring those who had served the University for twenty five years. Mr. Fordham was honored by the Massachusetts Horticultural Society with a Certificate of Appreciation. Dr. Richard Howard received a citation from the American Horticultural Society for services to that organization. He was elected an honorary life member in the Garden Club Federation of Maine.

At the commencement exercises of Framingham State College, Dr. Howard received an honorary Doctor of Science degree with the citation: "Scholar, interpreter of the world of plants to people of all ages, botanical explorer in the world's remote corners, entrusted with the care of our botanical treasures, he has taught us survival in the wilderness and the beauty of civilized nature. "

Four committees have been functioning during the year to consider the problems of operation of the Arboretum. The horticultural committee meets weekly and has been chaired jointly by [Dr. Weaver](#) and Mr. Gary Koller. All staff members in Jamaica Plain, including the superintendent and the union representative, are invited to attend the discussions.

The library committee is chaired by Mrs. Lenore Dickinson, librarian jointly for the Arnold Arboretum and the Gray Herbarium. Members are Drs. Schubert and Sponberg of the Arboretum staff, and Dr. Elizabeth Shaw of the Gray Herbarium. Dr. Alan Erickson attends, representing the Harvard University Library system. The herbarium committee is chaired by Dr. Norton Miller, a joint appointee of the Arnold and the Gray Herbarium, and includes Mr. Canoso, also a joint appointee, Drs. Weaver and Carroll Wood of the Arnold, Dr. Rolla Tryon of the Gray Herbarium staff, and Dr. Donald Pfister, representing the Farlow Herbarium.

The Journal of the Arnold Arboretum committee functions under the leadership of Dr. Schubert. An educational committee for Jamaica Plain comprises staff members Mrs. Burch and Messrs. Canoso, Koller, and George Pride, volunteer Mrs. June Hutchinson, and Mrs. Margaret Savage representing the Neighborhood Coalition of Jamaica Plain. Miss Margo Reynolds serves as chairperson. Reports of the committee meetings are posted; and plans, programs, and recommendations are circulated in the staff produced *Arboretum Newsletter* edited by Miss Reynolds.

HORTICULTURE

The care of the living collections and the appearance of the grounds are the responsibility of the Arboretum staff. However, by legal agreement nearly a century old, the protection of the collections by fences and gates, the care of the roads, paths, and benches, and the surveillance by the police are the responsibility of the City of Boston. The care of the living collections is becoming increasingly difficult through the failure of the City to fulfill its obligations. In spite of meetings with City officials last year, there has been no improvement, and little cooperation beyond that of Station 13 of the Police Department. Fences in conspicuous locations, damaged by automobiles, remained unrepaired during the full year, although a section of stone wall was repaired. The City asked for bids to repair the driving and pedestrian gates which are so deteriorated as to be unsightly, and the Arboretum staff cooperated in determining priorities. However, no contract was awarded and nothing was done. The macadam paths are so fractured in many areas as to be dangerous for pedestrians, and pieces are used regularly by vandals as missiles.

Almost in desperation the director requested permission from the President and Fellows to spend Arboretum funds on a three-year program to repair those gates, fences, paths and benches which are the City's responsibility. A proposal, legally acceptable to the University, and one which would protect the Arboretum, was submitted to the City in the spring, with no response by the end of the fiscal year.

Another time-consuming episode of the past year involved the Adams-Nervine property. These eight acres, with seven buildings, jut into the Arboretum property and form part of the boundary between the administration building-greenhouse area and Centre Street. The Adams-Nervine property was no longer needed by the Faulkner Hospital and was placed on the real estate market. Acquisition of the land by the Arboretum would permit expansion of our collections on contiguous land; the development of special collections; the possibility of a new entrance, of parking, of a reception center, of dormitory space for student employees, and even public toilets. Accordingly, permission was obtained from the President and Fellows, and a bid was submitted and accepted by the Adams-Nervine trustees. The proposal had to be withdrawn on the day the agreement was to be signed when the Boston Landmarks Commission designated the property, including the buildings, a Historical Landmark. The Arboretum would have demolished many, if not all but one of the buildings on the site. The Landmark designation required the preservation of all of the buildings and would have prevented clearing any land for

expansion of the Arboretum collections. Many hearings and appeals were involved. The Arboretum acquired the support of the local residents through the Jamaica Hills Association but was opposed by the Boston Redevelopment Authority, the Landmarks Commission, and many of the local political officers.

Subsequently, the Mayor signed a "temporary designation," and a bid was accepted by the Adams trustees from a developer who agreed to create taxable condominiums within the large buildings. We shall watch with interest the duration of the "temporary designation" and the alteration of zoning regulations on the property. We regret that neither the Mayor nor the Parks Department felt able to support our desire for this property as an addition to the Arnold Arboretum.

The extremes of weather that Boston can experience were well exemplified during the year. The four months, October through January, proved to be the coldest Boston has experienced since 1918. On January 7 Boston attained an official reading of 18.8 inches of snow, and the Arboretum in Jamaica Plain had over 15 inches, the most snow for one January day since 1897. March and April proved to be warmer than normal, and by April 21 the plants were two weeks ahead of schedule.

April rains in excess of normal caused flooding on the grounds due to blocked drains. On May 9 the only measurable snow ever recorded in eastern Massachusetts for May caused great damage in Weston but none in Jamaica Plain. A total of 11 inches of wet, heavy snow was recorded at the Case Estates, with the plants in full leaf and in flower.

The remainder of May and the month of June proved to be exceedingly dry and we were plagued with fires on the grounds. The grounds crew and the pruners were extremely busy following each storm, for plants were broken and twisted, requiring much repair work. Electric power was lost in both storms, although the use of emergency generators saved the greenhouse collections in both Jamaica Plain and Weston.

Following the storms the living collections were reexamined carefully. As a result, a number of damaged or deteriorating plants, weed trees, and duplicated plants were identified. Many have been removed and others will be. The nursery inventory had also increased during the past few years, and a careful survey of our needs revealed that about half of the accessions were unneeded. All surplus plants are offered first to the University, and large numbers were accepted by the College, through the office of the Landscape Architect, and by the Business School. The remainder were then offered to other arboreta and botanical gardens and to local colleges or towns, including Cambridge and Weston. The final disposition of surplus plants was made to the Friends of the Arnold Arboretum.

Several generic collections in Jamaica Plain and Weston received special attention in association with taxonomic work of the staff. The entire *Philadelphus* collection was repropagated during the summer of 1976, and when the plants are large enough, they will be used to replace the existing collection which lacks vigor and is not visually attractive. The birch

collection was checked for identification, for representation in our herbarium, and for evidence of infestation by a bronze birch borer. This is among the most serious pests now in the Boston area, and there is a question whether plants in any area of the grounds can be protected against infestation.

In response to requests for plant materials for growth or for experimental projects, 130 shipments were made representing 630 taxa, and 54 shipments of seeds of 160 taxa. Most requests came from the United States, but some also from fifteen other countries in North America, Europe, Asia, and the West Indies. Two hundred nine taxa were propagated to prepare replacements for specimens that appeared to be failing or were represented by insufficient numbers in the collections.

At the request of the office of the Landscape Architect, a section of land on the Case Estates has been designated for the use of that department to grow selected plants for University use. Many desirable landscape plant materials are not available in quantity from our surplus plants or in large size from commercial sources. The land chosen will be used to plant out smaller plants and give them sufficient time to develop larger stature, to be available when needed. Dr. Weaver completed a project of identification and mapping of all the plants on the grounds of the Business School.

The greenhouse staff propagated mulberry seedlings to be held in our greenhouses for a silkworm research project of the Medical School. The greenhouses are also used to aid graduate student research, and materials are being cared for in the programs of seven graduate students.

A portion of the South Street tract of Arboretum land is being studied in cooperation with the City of Boston for the establishment of neighborhood vegetable gardens on a temporary basis. The land involved cannot be developed for the Arboretum collections until the final plans are made for the relocation of the Orange Line and the Forest Hills rapid transit system operations of the Massachusetts Bay Transportation Authority. The line's relocation and the associated highway development will alter the drainage and the boundaries of the property. The temporary use for "victory gardens" can be implemented provided the City will install pipes and supply water.

The staff also is developing plans for a walk to be constructed on top of a storm conduit through the meadow near the administration building. Such a walk through a marsh-swamp area would offer convenient observation of the swamp plants and the wild life which abounds in the area. The actual installation of the walk will require permission of the City of Boston.

The Arnold Arboretum serves as the International Registration Authority for specific groups of cultivars, and as the National Registration Authority for woody plants not otherwise represented by registration appointees. Dr. Spongberg is chairman of the plant nomenclature and registration committee of the American Association of Botanical Gardens and Arboreta,

and of the comparable committee for the American Horticultural Society. A two-day conference was sponsored by the Arnold Arboretum for those persons involved in such activities.

A special gift from Mr. Paul Bernat has permitted the development of a plant propagation unit in the cold storage house in the greenhouse area. The experiment is designed to root cuttings under artificial lighting, and with controlled temperature and humidity, so that the plants, once rooted, can be held at low temperatures until the weather permits direct transplanting to outside beds. If successful, this project will reduce the intensive labor requirements of hardening off rooted cuttings and several transplanting sequences.

Mr. Peter Chvany was commissioned last year to produce a film for the Arnold Arboretum on the subject of plant propagation. The filming and editing were completed during the year, and the prints for showing should be available in the fall. Mr. Chvany's interest in E.H. Wilson as a photographer led to an [issue](#) of *Arnoldia* on the subject, and a special exhibition of Wilson's photographs.

The year 1976 marked the hundredth anniversary of Wilson's birth. The work may be continued in producing a book on Wilson, and Mr. Chvany is transcribing many of Wilson's field notebooks and diaries. There is an attempt to establish a Wilson garden in Chipping Campden, England, Wilson's birthplace. The Arboretum is preparing copies of Wilson artifacts for the exhibition there.

CASE ESTATES

An open house was held at the Case Estates on May 8, and the grounds and flowering trees were magnificent following the early warm weather. A large number of visitors enjoyed a perfect day. However, the following day the only heavy snow storm ever recorded in this area for the month of May hit the Case Estates. Eleven inches of heavy, wet snow accumulated before the storm was over, and the trees in full flower and leaf suffered extreme damage. Forty trees were so badly broken that they had to be removed from the organized collection. The pruning crew from Jamaica Plain spent the rest of the month in Weston, aiding the Weston staff in the cleanup and repair operation. The staff are to be commended for carrying through the extra labor required to handle the effects of this storm. However, the full year's work program was set back.

The long-planned work on Wellesley Street was completed by the town of Weston during the summer of 1976. The Corporation approved the gift to the town of one quarter of an acre total land to permit the straightening of Wellesley Street, improvement in street drainage, and the location of a sidewalk within the boundaries of the Case Estates. The single stone wall, which has been a feature of the boundary of the property along Wellesley Street, was not moved, but the raising of the road level by a foot or more reduced the optical impression of the size of these boulders. In all, the addition of a safe walkway for visitors is an asset to the property, and flooding has been eliminated from a section of the nursery by the installation of drains.

A new brochure for a self-guiding tour of the Case Estates was prepared, and is made available to visitors. New labels have been placed on many of the trees and shrubs, and informative signs are installed on many of the ground cover plots.

The small lecture room in the Red School House was used for lectures in the fall and winter class program, and was made available for special meetings for several visiting groups as well as for meetings of the American Rock Garden Society, the Rhododendron Society, and the American Hemerocallis Society.

The clonal plantings of the Cabot Foundation in one section of the Case Estates have been maintained for nearly thirty years for the study of growth rates and hardiness in *Populus*, *Quercus*, and *Pinus*. With the death of Mr. Scott Pauley several years ago, and of Dr. Albert Johnson during the year, the responsibility for the continuing observations has been given to Dr. Harrison Flint of Purdue University and Dr. Frank Santamour of the United States National Arboretum. Material is taken on a regular schedule for hardiness testing and other studies.

One recent observation is of interest. *Pinus strobus*, the native white pine, is subject to attack by the white pine weevil, which causes shoot dieback and a slow growth. The Balkan pine, *Pinus peuce*, although slower growing, appears to be resistant to the weevil. A hybrid of these two species, produced by Dr. Johnson, has proved to be resistant to the weevil and to have a better growth rate than either of the parents. A new series of resin acids, present in *Pinus peuce* and in the hybrid, have been found through chemical studies. This may be significant in the production of weevil-resistant trees for New England forests as well as for ornamental plantings.

HERBARIUM

There is little progress to report on the basic problem of cramped quarters and less-than-desirable storage conditions for herbarium specimens in the Harvard University Herbaria building in Cambridge. As reported earlier, the Corporation did approve an addition to the building, and preliminary drawings were made by consulting architects in collaboration with the Planning Office to permit cost estimates and the quest for funding. A descriptive appeal brochure was prepared and an advisory committee was appointed. Dr. John Torrey is chairman of the committee, yet full, active support of the University is lacking. No significant progress has been made in acquiring the funds for the building construction.

The curatorial work in the herbarium and library in Cambridge has been supported in part by a grant from the National Science Foundation to the University for the collections of the Arnold Arboretum, Botanical Museum, Farlow Herbarium, and Gray Herbarium. The portion assigned to the Arnold and Gray permits the employment of extra mounters and inserters, the acquisition of some supplies, and retrospective binding and cataloguing in the libraries. At the end of the initial grant, permission was obtained from the National Science Foundation to purchase sixty-one herbarium cases, which were placed in the area formerly devoted to the fern collection before that was relocated. This required a considerable shift in the herbarium,

with the result that some of the families are now inconveniently out of sequence. Although it has been possible to remove from cardboard box storage all of the Compositae, since this family is particularly susceptible to insect infestation, nevertheless, 2,400 cardboard boxes are still used on tops of cases to store mounted material.

The original curatorial grant expired and an application was prepared for a new grant, which was approved in part. The new grant contains an allotment for the purchase of compactors to be utilized in the addition to the building. However, if the building is not ready for occupancy, the significant grant item may be lost.

A curatorial inventory was made of the fruit, seed, and cone collections maintained separately from the herbarium but cross-referenced in it. There are at present 13,846 such items in Cambridge, and 3,682 units associated with the herbarium of cultivated plants in Jamaica Plain.

Specimens totaling 9,573 were received as accessions during the year, representing exchange, gift, subsidy, identification, and staff collections. Through mounting and direct insertion, 13,203 specimens were added to the herbarium, bringing the total in the Arnold Arboretum herbarium to 1,068,027 specimens, of which 163,268 are of cultivated plants housed in Jamaica Plain. Specimens distributed to other institutions in an exchange program were 2,790.

The herbarium is used on a daily basis by the staff of systematic botanists comprising the Arnold Arboretum professional staff. Myriad questions are answered or the answers sought from the plant material preserved as herbarium specimens. The specimens are fundamental to monographic or floristic studies as recent publications show. Specimens are borrowed from other herbaria to supplement our own holdings in special studies; and are loaned to other institutions or scientists for study and annotation, and are cited in their publications. Fragments of material may be used or supplied for special studies. One of the most interesting is the recent study of mineral accumulations in leaf tissue by Dr. Robert Brooks of New Zealand. The abundant collections of the Arnold Arboretum from tropical Asia have aided in his study of hyper-accumulation of nickel by plants growing on such deposits in Celebes and the Moluccas. Some plant collections revealing large amounts of nickel have even suggested areas worthy of mineralogical study and possible commercial development.

No record is kept of the daily use of the herbarium or the number of specimens consulted or annotated. The activity of the staff and students, however, is indicated in the incoming and outgoing loans. During the past year, 170 loans were made to 56 different institutions in the United States totaling 13,993 specimens. Loans totaling 8,676 specimens were sent to 37 institutions in 16 countries. At the present time, 94,589 specimens from the Arnold/Gray herbaria are on loan. During the year 200 loans were returned totaling 21,989 specimens. It is this type of activity which merits the support of the curatorial grant from the National Science Foundation. However, the cold, numerical statistics do not express fully the

work involved in handling the correspondence; locating, extracting, repairing, fumigating, photographing types, counting, packaging and shipping the specimens; and repeating most of the process when the material is returned.

The manager and the curatorial staff are the devoted and uncredited aides to the scientific work that results from the use of herbarium specimens. Now there has been one more regulation added to their obligations. The adoption by the United States government of the goals of an international program for the conservation of natural resources includes the recognition of threatened and endangered species and the regulation of trade or movement of these species. The list of species so controlled includes many specific plants, those difficult to distinguish from the endangered species, and even such general groupings as cycads, cacti, and orchids. The regulations apply not only to whole organisms, living or preserved, but to parts as well, and to herbarium specimens.

There is a provision for scientific institutions to loan or exchange such material, and application was made on behalf of the Arnold Arboretum for permission to send on loan herbarium specimens from our collections. This, in practice, requires the annotation of all packages with the code designating this permit. Although the Arnold Arboretum now has this permit, it is not yet clear how this affects the field work of botanists who may collect for scientific study such general groups as cacti or orchids. As an example of the lack of clarity of present regulations, Dr. Howard, on a field trip to the West Indies, found a cactus not previously reported on the island of St. Maarten, and a second on the island of Saba. In theory, permission to collect these new records should have been obtained before the field work was started.

LIBRARY

All staff positions in the library were reviewed by the Personnel Office during the year, and library assistants were raised to grades 3 and 4. Under the supervision of Mrs. Dickinson, librarian, Mrs. Sheila Geary is in charge of the library in Jamaica Plain; and in Cambridge, Mr. Mark Belson, interlibrary loan assistant, Miss Susan Farwell, bindery assistant, and Miss Sandra McLeod, public services assistant, hold appointments made jointly with the Gray Herbarium.

A library committee of staff members of the Gray Herbarium and the Arnold Arboretum offer advice and guidance. Under discussion at the present time is possible participation in a computer-assisted cataloguing system and conversion of the library to the Library of Congress system of classification. The former would eliminate the present hand-processing system, while the latter would produce cataloguing in conformance with national standards, and provide such by-products as union lists and subject lists.

With the aid made possible by the NSF curatorial grant, retrospective cataloguing and revision continued, and old volumes were rebound or restored. Pamphlets of the eighteenth century were removed from old bindings and rebound in cloth with acid-free end papers. All book plates now used in the library are also printed on acid-free paper.

During the year 725 volumes were added to the library, received by purchase, in exchange for our publications, for review, or by direct gifts. The library now contains 85,829 volumes and pamphlets

Of particular interest was a sizable number of books, pamphlets, and artifacts associated with the work of [Charles Sargent](#), given to the library either outright or on permanent deposit by the Sargent-Murray-Gilman-Hough House of Gloucester, Massachusetts. The Worcester county Horticultural Society presented several original letters of Charles Sargent, while other individuals allowed such letters to be copied.

Use of the library in Cambridge can be judged by the number of volumes borrowed from the shelves by staff, students, and visitors. This number increased by eight per cent during the year. Total requests numbering 626 were received for interlibrary loan of materials, of which 383 were on standard Interlibrary Loan (ILL) Forms. Although some requests had to be refused due to the condition of the items, many could be handled by photocopying, and only a few volumes actually were loaned.

The library of the Arnold Arboretum is rich in historical and archival materials which still require a great deal of work in cataloguing and maintenance. A special room is proposed in the herbarium addition for such materials to be assembled. When space is available, grants may be sought to expedite this work. Among the archival material, reference is made to historical letters in response to many requests for information during the year. For example, the Big Horn Commission issued during the year a volume entitled *Rediscovering the Big Horns*, based on rephotographing the scenes taken during the expeditions of [John George Jack](#), dendrologist on the Arboretum staff in 1900. The photographs show the changes between 1900 and 1975, and the archival material in the Arboretum library revealed many of Professor Jack's notes on the vegetation seen in the photographs.

VOLUNTEERS

The Arnold Arboretum staff is very fortunate to have a group of willing helpers called "Volunteers," who donate their time, effort, and talents to many phases of our operations. They are a diverse group, male and female, young and old, retired or still working for a living, talkative or quiet, single or now alone, and a husband and wife team. Some live nearby, while one is unique in being the wife of a college professor living in Switzerland. When her husband spends several months here each year, our volunteer reports for duty at the Arboretum. Many do report on a regular schedule, and others are available on call. We keep no records of the hours they devote to the Arnold Arboretum, and their real reward seems to be in the satisfaction they receive in being part of this staff. They receive no compensation other than an occasional surplus plant, but all receive our sincere thanks and deep appreciation. They are a real help to the staff and are one of the Arnold Arboretum's assets.

Many groups of visitors come to the Arboretum and request a guided tour. Volunteers who like to teach and to answer questions have been the guides for groups of school children

and visiting garden clubs. Several have assisted in staff-taught courses or have offered those of their own. Volunteers have helped staff the building on weekends during the spring; are present when the greenhouse area is open; or are on the grounds during open house occasions or visits by conventions. Information tables at flower shows have been staffed by volunteers who answer questions about the exhibit or about the Arnold Arboretum. In fact, these are usually the people who helped prepare and stage the exhibit.

The greenhouse is an area popular with volunteers, and their efforts are diverse. They collect seeds and propagating material on the grounds to help fill requests or to serve research needs. They clean the seeds, keep records, and do germination experiments. They weed, take inventories, package plants for mailing, including the massive distribution of small plants to the Friends. They spray rabbit repellent, tie up plants for the winter, record flowering and fruiting times, inspect for disease, and check labels. They pot plants, transplant seedlings, and prepare grafts and rooted cuttings. The greenhouses are open to the public one afternoon a week, and volunteers offer this tour.

Volunteers have helped with the mapping of the grounds, even with the use of snowshoes and skis in midwinter.

In the library two volunteers have devoted many hours to restoration activities. They receive special instruction from the University Library's consultant on conservation, and have systematically dusted, cleaned, and oiled leather-bound volumes. Volunteers have helped prepare shelf lists, alphabetized and located folio volumes, devoted their linguistic talents to translations of titles or articles, relabeled and helped shelve volumes.

The volunteers are now preparing many of the reviews published in *Arnoldia* on volumes that are gifts to our collection. The collection of Kodachrome slides has been reorganized by the volunteers who keep up with the additions to the collection. The scrapbooks of clippings relating to the Arboretum are in excellent shape, and up to date, through volunteer help.

All of these many services are valued and contribute to the efficiency and effectiveness of the staff and the Arnold Arboretum.

EDUCATION

The role of the Arnold Arboretum as an educational organization is expressed in many ways, ranging from an active teaching role within the University to the passive role played by the labeled collections or the several publications. Formal courses were offered in the Department of Biology by Dr. Howard (Biology 209, The Phylogeny of the Flowering Plants) and Dr. Wood (Biology 103, The Taxonomy of Vascular Plants); while Drs. Miller and Wood each had a series of lectures in Biology 18 (Diversity in the Plant Kingdom). Drs. Howard, Miller, Stevens, and Wood were guest lecturers in other courses in the Department of Biology, in the School of Design, in seminar series, and in the graduate-student organized "Society for Expeditionary

Biology." Drs. Robertson and Wood both lectured in the special seminar series sponsored by the Harvard Summer School, and Dr. Howard taught a portion of the Summer School course, Biology S105 (Plants in the Tropics), offered in Miami, Florida.

Each staff member with an academic appointment offers a numbered research course in the 300 series, which represents individual instruction at the graduate level. Staff members also served as undergraduate advisors for the Department of Biology in the College.

A formal course entitled "Botanical and Horticultural Practices at Arboreta" was offered for the first time in 1977 as part of the Harvard University Extension program. Drs. Spongberg and Weaver organized the course, which included lectures, field trips, laboratory sessions, and individual projects under the guidance of a staff member, in addition to assigned work on the grounds. The course allowed the students selected for summer employment to earn four hours of academic credit. One day a week was devoted largely to lectures, laboratory sessions, and field trips. The students were graded not only on their work on the grounds but also on the oral presentation and written reports of their projects. The summer employees represented thirteen colleges, and the group included two work-study students.

Some New England colleges conduct a "Jan-plan" program, wherein students are required to participate in a professional organization during the month of January vacation. Other colleges use a "student intern" program in which a semester or one day a week are devoted to learning about a profession. The Arboretum staff agreed to accept students in these programs from Connecticut College, Colby College, Pine Manor Junior College, the University of Massachusetts, and the Buckingham-Browne and Nichols School. Depending on the length of time available, the students were assigned to one or more areas of Arboretum activities. At the request of the Cambridge Economic Opportunity Committee, two individuals reported for work-training at the Arboretum for a short period of time. Neither proved to be interested in horticultural work.

Many classes in horticulture from other colleges come to the Arnold Arboretum on prearranged visits. A staff member offers a tour of the facilities and the grounds. Many of these groups are interested in career opportunities, while others are concerned with operations or with the plant material. During the year requests for one to three such visits were received from the Universities of Vermont, Connecticut, Massachusetts, New Hampshire, and Maine, Springfield Technical College, Veterans Administration Hospital Horticultural Therapy program, Thompson School, Smith College, Essex County Agricultural and Technical Institute, Minuteman Regional Vocational Technical School, Ontario-Niagara Agricultural and Technical College, five high schools in Massachusetts, and the students of Longwood Gardens.

When Boston is the location of a national meeting, many organizations now include a tour of the Arnold Arboretum in their programs. The volunteers may serve as guides for some tours, but the staff will meet other groups such as the American Nurseryman's Association, the Landscape Design Critics Council of the Garden Club of America, the Parks and Recreation

Congress, and the Bristol and Norfolk County Tree Wardens, where the interest is professional rather than tourist. The Harvard Club schedules an annual visit to the Arboretum, and Innings and Outings, a newly formed group of Harvard employees, offered trips to Jamaica Plain and to Weston.

The Arboretum is listed among the places to visit during Commencement week, and special tours are arranged for the alumni who attend.

The Arnold Arboretum occupies a conspicuous place in Jamaica Plain and in Weston. The staff attempts to be cooperative with local groups in supplying speakers, advice, tours, or surplus plants. Open house occasions are scheduled each spring, with the staff on the grounds to answer questions. We have had direct contact with citizen groups in Jamaica Plain, West Roxbury, Roxbury, Roslindale, Cambridge, and Weston. Dr. Shiu-Ying Hu has been active in bringing groups from the Chinese community to the Arboretum.

The Arboretum staff answer telephone calls on a twenty-four-hour basis relating to possibly poisonous plants. Calls are referred to the Arboretum office in the daytime by the Boston Poison Information Center, and to individual staff members at their homes in the evenings. The Arboretum film *Poisonous Plants* is used frequently in staff lectures, and is available from several film libraries or from the commercial distributor. The film was reviewed very favorably in the *American Association for the Advancement of Science* film review issue.

A cooperative educational program continues with the Massachusetts Horticultural Society. A series of tours called Arbo Rambles is conducted jointly at the Arboretum. The Arboretum staff have also participated in a lecture series held at Horticultural Hall. The staff helped stage a midwinter Orchid and Camellia Show, while the Arboretum exhibit at the Spring Flower Show displayed a map of the world with cultivated ornamental plants in their area of origin. Volunteers at the Arboretum not only helped assemble and label the exhibit, but were present during show hours to answer questions. The exhibit was awarded a first prize, an educational merit certificate, a gold medal, and the coveted Bulkeley Award for educational excellence.

Four exhibitions were held in the lecture room of the administration building of the Arnold Arboretum in Jamaica Plain. "Wilson as a Photographer" was prepared by Mr. Chvany; "Bark Is Beautiful" featured the color photography of [Mr. Albert Bussewitz](#); "Flowers--Art or Science?" displayed the paintings of Mrs. Eudoxia Woodward; and the final staff exhibit was on "Poisonous Plants."

During the spring and the fall, the Arboretum staff offer a series of courses open to the Friends and the general public. Thirty-nine courses, ranging from one two-hour session to five weekly meetings of varying duration, totaled three hundred hours of instruction.

Two special seminars were organized by the staff during the year. Mr. Koller arranged a program entitled "Interpretation--What Do We Have to Offer," with speakers Mr. Koller for the

Arboretum, Mr. Charles E. Roth of the Massachusetts Audubon Society, Dr. Darrell Apps of Longwood Gardens, and Mr. Bruce McHenry of the National Park Service. Those attending represented thirty organizations from five states. Dr. Spongberg organized a two-day discussion for a group of invited participants on the subject of registration and nomenclature of cultivars. The meetings were held in Jamaica Plain and in Cambridge on successive days.

TRAVEL AND EXPLORATION

The Arnold Arboretum is an institutional member of several national and international societies, and staff members may be individual members of professional societies, serve on committees, or present papers which require their presence at annual or regional meetings. It is well for the Arboretum to be represented, and profitable for the individual to participate. Accordingly, partial financial support for attendance is shared among the members of the staff. Visits to herbaria or other botanical gardens yield information of value to our organization, and permit the exchange or acquisition of material, and further staff research.

Mr. John Alexander is on the Board of Directors of the International Lilac Society, and attended the annual meeting as well as a preparatory meeting in Amherst, Massachusetts. He was a participant at the annual meeting of the International Plant Propagators Society, and attended the regional meeting of the American Association of Botanical Gardens and Arboreta at the Old Westbury Gardens on Long Island, New York.

[Mr. Fordham](#) spoke on propagation of the Hamamelidaceae at the International Plant Propagators meeting in New Jersey, and participated in the Connecticut Nurseryman's Education Program in Connecticut.

Dr. Howard conducted field work related to his research on the Lesser Antilles in visits to Barbados, St. Vincent, and Grenada, and collected specimens. As a member of the Scientific Advisory Board of the Arbor Fund, he attended a meeting at the Bloedel Reserve in Washington, en route visiting the Denver Botanic Garden, the University of Washington Arboretum, the Pack Forest, and the University of British Columbia Botanical Garden. He represented the Arboretum at the dedication of the bonsai pavilion and collection at the United States National Arboretum, and spent time during this trip at the National Herbarium in Washington, D.C. He was the principal speaker at the dedication of the Mini-Arboretum of the City of Portland, Maine, established by the Longfellow Garden Club.

Dr. Hu has published two papers on the medicinally useful plant, ginseng. There is a recurrence of medical interest in this plant for its reputed value in the revitalization of elderly people and those under physical stress. She was invited to attend and speak at an International Gerontological Symposium held in Singapore, and en route visited gardens in Istanbul, Tehran, Bangkok, Sri Lanka, and India. At several herbaria she was able to renew her work on collections of Ilex. Later in the spring she spoke about ginseng at the National Institutes of Health in Bethesda, Maryland, and also presented a seminar at the University of Maryland.

Mr. Koller represented the Arboretum and spoke at the annual meeting of the AABGA held at the Missouri Botanical Garden, and at regional meetings at Old Westbury Garden and at the Frelinghuysen Arboretum.

Miss Donna Lynch visited the Brooklyn Botanic Garden, the Morris Arboretum, the Longwood Gardens, the U. S. National Arboretum, and the facilities of the American Horticultural Society and the Plant Sciences Data Center in Mount Vernon, Virginia.

Miss Reynolds represented the Arboretum at the AABGA symposium, "Facing the Future," held at the Callaway Gardens, Pine Mountain, Georgia.

Dr. Spongberg reported on plant registration activities at the AABGA annual meeting in St. Louis. He also visited the U. S. National Arboretum when he was in Washington, D.C., as a speaker at the annual meeting of the American Magnolia Society.

Dr. Stevens spoke to the staff of the New York Botanical Garden of his work on the evolution of tropical Ericaceae, and to the Massachusetts Rhododendron Society on Malaysian Rhododendrons.

GIFTS AND GRANTS

The Arboretum and its staff have been fortunate in the support offered in the form of gifts, grants, and materials from many individuals and sources. The Friends of the Arnold Arboretum respond to annual requests that they renew their membership contributions, and the staff are grateful for this continuing support. Such funds are without restrictions. Although most are used in the work associated with the living collections, some have been used in the production of an educational film on plant propagation; and during the present year, in the support of field work in Japan and Korea for additions to our living collections.

A special gift was received from Mr. Paul Bernat for experimental work in plant propagation. A grant from the Stanley Smith Horticultural Trust enables artistic work associated with Dr. Spongberg's work on a manual of cultivated trees and shrubs. A grant from the Charles E. Merrill Trust was specified for the publication of Dr. Howard's *Flora of the Lesser Antilles*, Dr. Lily Perry's treatment of the medicinal plants of Asia, and work on the manual of cultivated trees and shrubs.

Memorial gifts were received in memory of Mrs. Katharine Abbott Batchelder, who died on January 11, 1977. Mrs. Batchelder was, for many years, a member of the Committee to Visit the Arnold Arboretum. She supported, anonymously at her request, work on the taxonomy of cultivated trees and shrubs, and continued this support by a bequest. The obituary notice requested gifts to the Arnold Arboretum in her name, and thirty-four gifts were received.

Artifacts associated with the history of the Arnold Arboretum are always welcome. Special gifts of [publications](#) of [Charles Sargent](#) were received from the Sargent-Murray-Gilman-

Hough House; papers of [James Arnold](#), from Mrs. Charles Jackson, Jr.; letters of [E.H. Wilson](#), from the Worcester County Horticultural Society.

Gifts of books for the library were donated by Mr. Fred Bonnie, Dr. Richard J. Eaton (now deceased), Mrs. Constance Derderian, Mr. Augustus Kelley, Mr. George Taloumis, and the Botanical Museum, the Hunt Institute for Botanical Documentation, the Pennsylvania Horticultural Society, and the Wing Lung Bank. Several other donors wished to be anonymous.

We are grateful for gifts of plant materials from Hillier and Sons Nurseries, Monrovia Nursery Company, Princeton Nurseries, and the Weston Nurseries.

The grant from the National Science Foundation, shared with other botanical collections at Harvard, is truly significant in the curatorial work in the library and herbarium. A grant for an additional three years was received during the year.

PUBLICATIONS

The two regular publications of the Arnold Arboretum are the *Journal of the Arnold Arboretum*, issued quarterly, and *Arnoldia*, issued six times a year. The four issues of the *Journal* published during the fiscal year comprised 523 pages and twenty-three articles by twenty six authors. The assistant editor, Ms. Schmidt, is supervised by Dr. Schubert and assisted by an editorial committee. A subscription increase to twenty-five dollars a volume was announced for 1978. Mrs. Jeanne Wadleigh edited the six issues of *Arnoldia* comprising 320 pages and thirteen articles by fourteen authors. Miss Reynolds was appointed assistant editor of *Arnoldia*. Issues of *Arnoldia* now contain regularly book reviews written by members of the staff and the Arboretum volunteers.

Books received for review are added to the library, and the reviews are published if the volume is considered of interest to the readers of *Arnoldia*. Two issues were regarded as special ones. In one, in a photographic essay, Mr. Chvany considered E. H. Wilson as a photographer. For another, Mr. Fordham and Miss Leslie Spraker prepared a "Propagation Manual of Selected Gymnosperms," based on the experience in handling these plants at the Arnold Arboretum.

The second volume of the *Flora of the Lesser Antilles* was issued by the Arnold Arboretum. The Flora is part of Dr. Howard's research, and the volume on the Pteridophytes was prepared by George R. Proctor. A grant from The Charles E. Merrill Trust assisted in the publication. Two publications of the Arboretum, long out of print, are again available through commercial sources. *Contributions from the Arnold Arboretum Number 9*, "Species of *Tradescantia* Indigenous to the United States," by Edgar Anderson and Robert Woodson, is available as a microfilm or a xerographic reprint through University Microfilms of Ann Arbor, Michigan. *A Monograph of Azalea, Rhododendron Subgenus Anthodendron*, by E.H. Wilson and Alfred Rehder, has been reprinted in facsimile by the Theophrastus Publishers, Little Compton, Rhode Island. Otto Koeltz Antiquariat, The Netherlands, received permission to reprint Alfred

Rehder's *Bibliography of Cultivated Trees and Shrubs*, a volume also out of print. Forty-three books and articles were published during the year by seventeen members of the staff.

Richard A. Howard, Director