

The Director's Report
Arnold Arboretum
1989-1990

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Robert E. Cook, Director

The Arnold Arboretum of Harvard University
125 Arborway, Jamaica Plain, Massachusetts 02130

1990



For her love of plants and the Arnold Arboretum,
we dedicate this annual report to the memory of

ELEANOR CABOT BRADLEY
1893-1990



A Time of Transition

*I*t has been over four years since the last annual report for the Arnold Arboretum was written by former Director Peter Ashton. Many administrative changes have taken place in the interim. In 1987, Dr. Ashton resigned as Director and returned to full-time academic duties as Professor of Dendrology in the Department of Organismic and Evolutionary Biology (OEB).

In 1988 the Dean of the Faculty of Arts and Sciences (FAS) initiated a complete review of the Arnold Arboretum, leading to a reevaluated mission statement and a affirmation of the University's commitment to the Arboretum through a new administrative structure. No longer would the Arboretum operate within a department of FAS; instead the new director would report to the President through the Vice President for Administration, Sally Zeckhauser. The director would still carry the title Arnold Professor, but he or she would hold a non-tenured administrative position at the pleasure of the President. Finally, income from the endowment of the Arnold Arboretum would, in the future, no longer support professorial appointments in FAS. As current professors on the Arboretum staff resigned or retired, the released funds would be used to support non-professorial appointments or other Arboretum goals at the discretion of the director. Through this clear separation from the Faculty of Arts and Sciences, the Arnold Arboretum would be free to pursue its own destiny. The institution had moved from an academic niche among professors to a new position within central administration.

In this, the 118th year of its existence, what would be the long-term implications of these major changes for the Arnold Arboretum? Although not explicitly stated, this question would be the most important issue facing a new director. In January 1989, I assumed this responsibility.

Shortly after I arrived, the underlying ambiguity of the Arboretum's new position came to the surface. In Cambridge, a building belonging to the Faculty of Arts and Sciences houses most of the library and herbarium collections of the Arnold Arboretum, which are under the direction of Professor Donald Pfister, an OEB professor. The resignation of the



Children's Program guide
Phoebe McCarthy showing
cattails to a 4th grade class
from the Agassiz School,
Boston. Photo by I. Ràcz.

head of the combined libraries in this building necessitated a search for a replacement. Because the Arnold Arboretum provides half the salary for the head librarian (and nearly half the funds for the overall operations of this building), Professor Pfister invited my participation in the successful search. While we have informally continued to share decision-making for the past year-and-a-half, an unequivocal separation between the Arnold Arboretum and the FAS does not exist. Administrative responsibilities for the Cambridge collections remain to be clarified.

Short-term goals

Prudence for a new director often involves mustering considerable patience while listening very carefully. I established some very simple, immediate goals as I quietly expanded my understanding of the unusual history that created this institution. One goal, sound management of our finances, is particularly critical. At the end of this report, you will find evidence that we have accomplished this for the short term. Our growing financial health convinced me that we could maintain the status quo for nearly all of our existing programs while a general evaluation of operations was conducted. This led to an overall review of personnel, an appropriate next step. We examined job descriptions and levels of compensation, followed by needed salary adjustments. I also created a new administrative structure, which is reflected in the organization of this report. Finally, we moved to address a number of deferred maintenance problems eroding the capacity of our facilities to support our work. It was a busy, if less visible, year of accomplishment.

A Master Plan For a New Century

In my first year as director, I also made a commitment to initiate a long-range planning process that would lead to the creation of a master plan. This would be the first time since the original Olmsted/Sargent collaboration that a comprehensive plan would be defined, one that could carry us well beyond the year 2000.

As the reader will see at the close of this director's report, considerable progress has been made toward the accomplishment of that goal. A master plan will clarify our relationship to our constituencies, not only as a unit within Harvard University and a component of Boston's Emerald Necklace of parks, but as a national and international resource for research and education. These long-range plans for the next century will be built on a solid foundation of day-to-day administrative accomplishments as reported here. Administration may lack the glamour and visibility of exciting new initiatives, but it is essential to the long-term stability of our institution.



Arboretum Director Bob Cook along with staff members Diane Syverson and Carol Kohler at the 1990 Plant Sale. Photo by I. Racz.



Phellodendron amurense,
the most photographed tree
at the Arnold Arboretum.
Photo by P. Del Tredici.

Living Collections

Management of the living collections of the Arnold Arboretum is the first priority of the director. During the past year we continued to maintain a very high level of curation following the final phase of the verification project, described in the Winter 1989 issue of *Arnoldia*. The Living Collections Department includes our horticultural and taxonomic expertise, our propagation facilities, our exceptional computer system for record keeping, our grounds staff, and the horticultural and historic component of our library collections.

A Collection of Trees

During the past year, a total of 843 individual woody specimens, constituting 273 taxa, were planted on the grounds in Jamaica Plain, bringing the permanent living collection to 5,493 taxa distributed as 14,066 individual plants or massed taxon groups. In addition, the Arboretum received a grant from the Institute of Museum Services to continue the verification project by conducting a comprehensive assessment of our *Rhododendron* holdings. This will yield a set of recommendations for renovation and expansion of our collections in this important group. During this period we made a special effort to survey and propagate plants in our *Carpinus*, *Syringa*, *Euonymus*, and *Viburnum* collections. Furthermore, planning was initiated for the establishment of two major memorial plantings in memory of Mary E. Wolcott and Linda J. Davison.

The Arboretum was asked to participate in two significant collaborations in the past year. Through the Graduate School of Design at Harvard, the Arboretum was host to two landscape design studios last fall. Over thirty-five creative minds were brought to bear on fundamental landscape issues involving the future use of the Stoney Brook Marsh and Walter-Weld tracts of land that are peripheral to the main Arboretum grounds.

A second collaboration initiated last year will involve the "permanent loan" of six large specimen trees to be transported to, and installed on, the site of the new Post Office Square Park in the financial district of downtown Boston. What does "permanent loan" mean, you ask? At the suggestion of Bob Weinberg, president of the Friends of Post Office Square, these trees will represent a part of the Arboretum growing in the

heart of Boston. They will also provide us with an ongoing horticultural and educational collaboration in this elegant park designed by the Halvorson Company for the people of the city.

The Case Estates

It was clear upon my arrival that the future of the 65 acres of land comprising the Case Estates in Weston has been a sensitive and controversial issue. For the short term, I decided to maintain the status quo pending a complete review of programs and the role of the Case Estates in the mission of the Arnold Arboretum.

Last year, more than 130 classes were held there, indicating its importance as a setting for our educational offerings. Plant societies and other horticultural organizations conducted thirty-two meetings in the Red School House. September saw the annual Rare Plant Sale and Auction,

magnificently orchestrated by the Arnold Arboretum Associates, who brought more than 2500 avid gardeners from afar to peruse the horticultural offerings.

Propagation

One of our most important resources is the expertise displayed every day in our propagation facility. Approximately 1270 accessions of new plant material came to the Dana Greenhouses last year, of which 75 percent were from other institutions or from field collections in distant lands. Accessions of special interest included bamboo and *Salix* taxa of horticultural value, and

species of *Malus* and *Prunus* from the USDA germplasm collections in Byron, Georgia and Geneva, New York. A total of 535 shipments of living plants or their propagules were distributed to cooperating institutions, nurseries, and individuals in the U.S. and in twelve foreign countries during the past year. Two major collecting trips were dispatched to Florida and Alabama to obtain population samples of the endangered *Torreya taxifolia* as part of our ongoing collaboration with the Center for Plant Conservation. Finally, over forty-five new taxa from wild sources were collected in China, including several interesting accessions of *Ginkgo biloba*.



The Rare Plant Auction tent at the Case Estates, September, 1990. Photo by I. Ràcz.

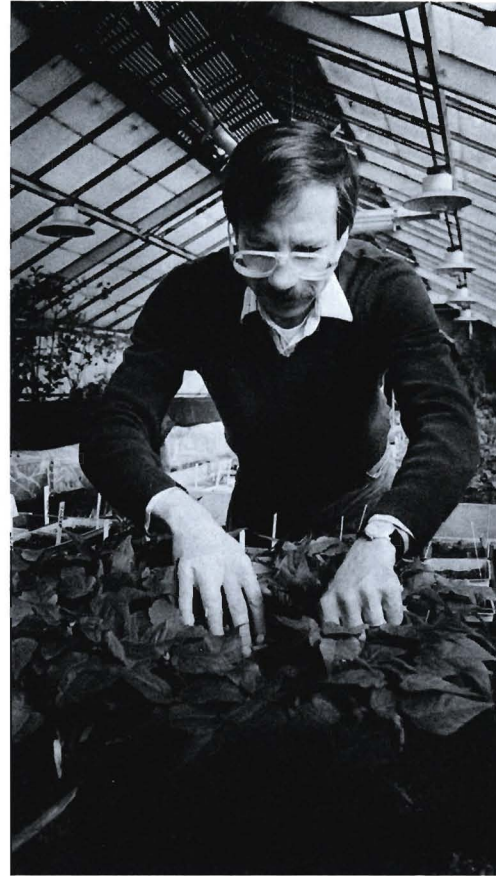
Records and Mapping

Much of the usefulness of the living collections of the Arnold Arboretum resides in the meticulous system of records kept intact and in continuous use since the first notebooks of Charles Sargent. Today a computer database has replaced the handwritten cards of yesterday. We maintain information on 23,931 plants, of which 14,066 are currently in the living collections. All accessions are entered into this database through a network of fifteen individual work stations. We continually update our records; last year, 5,780 individual plants were field-checked on the grounds.

Mapping the complete collection has been a major project in recent years. With the assistance of software specifically created for computer-aided design, we have been transforming our hand-drawn maps into the computer language that will interface with our detailed propagation and planting records. We will be able to simultaneously update our record and mapping systems, and to generate updated maps, in a matter of minutes. As a result of this work, which was initially supported by a grant from the Institute of Museum Services, all major trees identifiable from aerial photos have been inserted on these maps. Extensive ground checking of these maps will follow, along with the insertion of the remaining plants into the database. Last year, 11 of our 64 mapping quadrants were verified on the ground.

Grounds Management

Last summer Dr. Donald Wyman, former horticulturist at the Arboretum, paid us a visit and reported that he had never seen the grounds looking better. In the past two years we have achieved a much higher level of horticultural maintenance through the addition of new staff to our grounds crew and the purchase of new equipment. We have also increased the



Chief Propagator Jack Alexander. Photo by I. Rącz.

number of our summer interns to sixteen. For the first time in twenty-five years, we have initiated a program of turf aeration and fertilizer application throughout the Arboretum. Renovation of the lilac collection has continued with the creation of three new beds, the establishment of eighty lilacs, and the extensive planting of herbaceous ground-covers throughout this collection.



Work also continued in the Bradley Rose Garden, with extensive planting of propagated material from the greenhouse, stone edging of beds, and construction of a stone retaining wall in the vicinity of the Bradley bench. During the coming year we will be establishing new plants around the bench and developing a long-term maintenance plan for the collections in the Garden.

Through Harvard University, we successfully negotiated a new three-year contract with the Service Employees International Union Local 254. This union represents our grounds crew at the bargaining table. The contract includes a new type of term position at the Arboretum, called "Apprentice," which will give management considerable hiring flexibility in the future. It will also offer union employees new opportunities to expand their expertise through training in other departments of the Arboretum.

Mapping and Labeling
Assistant Kevin Burgess
Photo by I. Ràcz.

Horticultural Library and Archives

Just as important as the record-keeping system of the living collections is the historical importance of our library holdings. In addition to our horticultural holdings in Jamaica Plain (30,000 volumes, 180 current journals, 8000 slides), the Arboretum maintains 28,000 historic photographs and 1400 lineal feet of archival material. In January we installed a work station providing direct access to HOLLIS, Harvard's OnLine Library Information System, which will make information about our collections



Grounds crew members David Moran, Mark Walkama, and John Olmsted on their morning coffee break. Photo by P. Del Tredici.

more accessible to students and researchers in Cambridge and give our staff direct access to the University's catalogue. Finally we have begun to clean house; over 30,000 volumes were individually removed from their shelf location and dusted by our custodian, and one-third of our leather-bound volumes were treated with preservative. General conservation of our holdings will be an important priority for the future.



Herbarium Assistant,
Susan Hardy-Brown.
Photo by I. Ràcz.

Research

In Cambridge the herbarium and library collections of the Gray Herbarium, the Arnold Arboretum, the Botanical Museum, the Oakes Ames Orchid Collection and the Farlow Herbarium are contained within a single building, the Harvard University Herbaria. The last-mentioned holdings are in the original Farlow building, which is annexed to the larger structure. These combined collections continue to be an international resource of critical importance to systematic botany. With more than 4,800,000 specimens, these collections are especially rich in Asian plant material, largely due to the collecting efforts of past and present Arboretum staff. A subset of this collection (approximately 182,000 sheets) remains in Jamaica Plain as documentation of our holdings in our living collections.

During the past year, 27,832 herbarium sheets were mounted and added to the permanent collections, of which 17,759 were given Arnold Arboretum labels. Another 32,541 specimens were sent on loan to domestic and foreign institutions for research in plant systematics, and 21,034 sheets were returned by them. Major management activities during the past year involved reorganization of the vascular plant collections to make day-to-day curation easier, with special focus on the return of borrowed orchid specimens. Curatorial activities in the herbaria have continued through the appointment of post-doctoral associates, and a significant backlog of accessions has accumulated through Arnold Arboretum collecting activity in Kalimantan, Sarawak, and Sumatra in conjunction with our work for the National Cancer Institute (*see below*).

The combined botany libraries, also housed in the Harvard University Herbaria, are of equal importance as a national and international resource for botanical research. The fiscal year began in September with the appointment of a new head librarian, Judy Warnement, who has put together a support staff for reorganizing and integrating the separate library collections. This restructuring will soon improve and expand the range of services we provide to students, researchers, and visitors from all over the world.

The combined libraries possess more than 258,340 volumes and currently receive 1,262 journals. The holdings of the Arnold Arboretum give this library special strength in Asian botany. During the past year, 1,135 visitors registered to use the collections. Significant improvements were made toward efficient management and provision of library services through installation of two dedicated HOLLIS terminals.

Research Programs

Research use of the living collections has been expanding in recent years. A diverse but closely related collection of living plants, such as ours, has proven particularly valuable for studies in molecular systematics and comparative morphology, and we receive a large number of requests to assist in providing such material for research. Because chloroplast, ribosomal, and nuclear DNA can be efficiently isolated from fresh plant samples, we anticipate a growing demand for use of the collections for molecular studies. During the past year, researchers from Iowa State University and the University of Connecticut sampled our *Davidia* and extensive *Syringa* holdings for such work.

In another research program, the Arboretum is collaborating with the National Cancer Institute to survey our yew collections (*Taxus* species) for the production of a substance called taxol, which has proven effective against ovarian and other forms of cancer. At present, most taxol is extracted from Pacific yews (*T. brevifolia*) harvested in the wild. Consequently there is intense interest in identifying species or cultivars of yew with particularly high levels of taxol for cloning and genetic research leading to plantation production.

Finally, the Arboretum will continue to support ongoing research by staff members in Jamaica Plain, such as our work on powdery mildew and leaf-roll necrosis of lilacs, developmental studies of cloning in ginkgos, and propagation studies of endangered plant species as part of our collaboration with the Center for Plant Conservation.



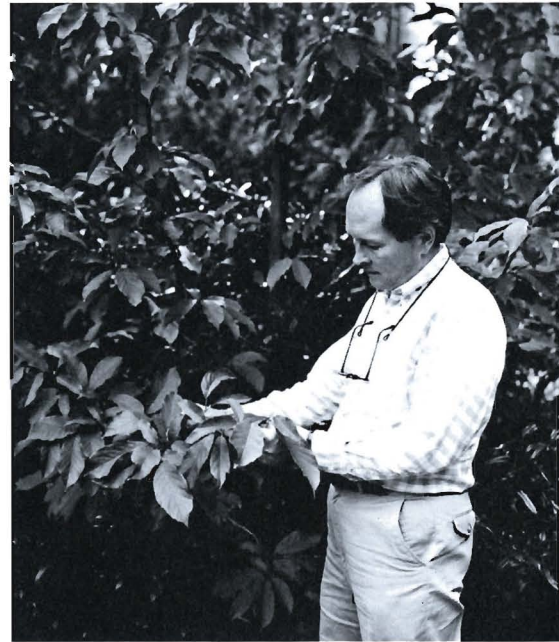
Assistant Plant Propagator Rob Nicholson with some *Torreyia taxifolia* cuttings from Florida. Photo by P. Del Tredici.

The Center For Asian Botany

A major new initiative is being built on several current research programs of the Arnold Arboretum. Called the Center for Asian Botany, this program combines under one umbrella three international research projects. First, we have strengthened our commitment to the "Flora of China" project funded by the National Science Foundation. This project entails translating and revising a multi-volume inventory of the Chinese flora, and it symbolizes our long historical involvement with botany in China. Last spring we hired a full-time research editor to oversee this work.

A second major project, supported by the National Cancer Institute, has involved conducting a botanical inventory in Indonesia. During the past year, three expeditions were mounted to the interior of Indonesian Borneo (Kalimantan) to collect samples of plants with potential anti-AIDS or anti-cancer properties based on a knowledge of their use in local medicine. Through a cooperative agreement with the Herbarium Bogoriense in Bogor, Indonesia, we will expand upon this work in the coming year.

A third program will build on the pioneering study of tropical forest dynamics initiated by Peter Ashton at Pasoh, Malaysia. Last year researchers finished a complete mapping and census of all trees and saplings growing on a 50 hectare site. The data are currently being analyzed for patterns of species distribution and replacement. Future expansion of this program to other countries in Southeast Asia is discussed below under Planning.



Stephen Spongberg examining the foliage of the Arboretum introduction *Magnolia zenii*. Photo by I. Rác.



Public Programs

Understandably, our most visible face is seen through the educational services we provide members of the general public. Last year our very successful adult and professional programs offered instruction in botany, horticulture, landscape design, garden history, and other plant-related subjects. Over 200 courses provided more than 1,000 hours of instruction to 5,145 students drawn from all six New England states and beyond. Classes are given in Jamaica Plain, at the Case Estates, and at the Harvard University Herbaria. Particularly popular were the all-day symposia held in collaboration with the New York Botanical Garden, both in New York and at the Graduate School of Design in Cambridge. With the Boston Museum of Fine Arts, we also cosponsored a special seven-part lecture series, "Romanticism and Landscape Design."

Last year we supported sixteen summer interns, drawn from a pool of fifty-eight applicants from across the country and from several foreign countries. In addition to training on the grounds, interns also worked in the greenhouse, in the library, and in our records and mapping department. They all attended required classes in woody plant identification, horticultural maintenance, and landscape design. They also participated in six field trips to regional gardens of particular interest.

The history and horticulture of lilacs was the theme of our display at the New England Spring Flower Show where we introduced the new cultivar *Syringa vulgaris* 'Frederick Law Olmsted.' The Arboretum picked up several awards, including the Ruth S. Thayer Prize, the Arno H. Nehrling Award, an Educational Award, and a Silver Medal. Additional awards were won for our exhibit of orchids from the Valentine collections, displayed at the Massachusetts Orchid Show.

Through the generous assistance of the Bank of Boston, a photographic exhibit entitled "A Vision of Garden and Wood" was displayed at the Hunnewell Visitor Center. Other exhibits last year included "Winter Silhouettes," a collection of photographs taken by Al Bussewitz, and paintings submitted as entries in our annual lilac poster contest. The Arnold Arboretum Bookstore continued to provide an outstanding selec-

tion of horticultural and conservation titles. Particularly popular with visitors were both the new series of postcards of Arboretum landscapes and the "Gardening Angel" brooch.

Arnoldia

Over the past ten years, membership in the Arnold Arboretum has increased from 2,400 to remain steady at approximately 3,000 since 1985. Our most important membership benefit is *Arnoldia*, a magazine primarily about plants for dedicated "plant people." Since March of 1989, *Arnoldia* has published 29 articles totaling 248 pages under the recent editorship of Peter Del Tredici. Each issue usually provides one article about Arboretum

projects or collections, one scientific article, a photo essay, and a miscellaneous article that might feature a piece of garden history or a special horticultural technique. While not a scientific, peer-reviewed journal, we do strive to maintain a high level of scholarship appropriate to the Arnold Arboretum.

The Children's Program

Our educational offerings to the children of local schools also experienced a very successful year. A total of 66 field visits brought more than 2,600 elementary school children to the Arboretum, accompanied by 141 teachers and 275 parents and aides. The children were drawn from 14 different school

systems, and half of them came from Boston public schools. The Arboretum also continued to participate in the Museum Institute for Teaching Science (MITS), a training program in which 101 teachers from 79 schools attended a two-week summer workshop. An additional 127 elementary school teachers participated in one-day workshops at the Arboretum. None of this would have been possible without the dedicated assistance of 37 volunteers who gave over 1,600 hours of their time to the program.

During the coming year we plan to expand our training for elementary-level teachers. We will introduce and disseminate a kindergarten through sixth-grade curriculum for the life sciences called LEAP (LEarning About Plants) developed at Cornell University.



Long-time volunteer Al Bussewitz leading one of his famous classes.
Photo by J. Eisenstadt.



Fourth graders with the Children's Program on a chilly fall walk.
Photo by I. Rącz.

Volunteers

Last year 120 volunteers put in more than 6400 hours of hard work throughout the Arboretum, an indication of their tremendous commitment to our programs. In our greenhouse, for example, we have a crew of individuals who provide invaluable assistance to the staff. Les Oliver, our senior volunteer at ten years short of a century, has contributed his time since the early seventies. Les is a retired professor of English who handles the production of our metal identification labels that keep track of our trees in the nursery. Dr. Richard Dwight, not far behind in seniority, helps Jack Alexander, head propagator, conduct his research on disease resistance in lilacs. Liz Ann Chapin works closely with the herbarium to prepare specimens of seedlings for documentation of our collections. And nearly everyone on the greenhouse volunteer crew—Dorothy Baldini, Nod Meyer, Caroline Blake, Jud Brooks, Ellen McFarland, Leo Levy—helps out with the seed cleaning, pot washing, soil mixing, potting, and just about any other job that needs doing. Whether working in the greenhouse, in our library, on the plant hot-line, at the Case Estates' Plant Sale, at education department symposia, or guiding tours, all our volunteers are tremendously valuable, and we deeply appreciate the help they give us.



Administration

*T*he mundane but essential core of any organization is the administrative infrastructure that services all the more exciting programs visible to the public. In the end, administration becomes the best measure of excellence. It is the foundation upon which the future is built.

Facilities

An assessment of deferred maintenance in our facilities was a high priority upon my arrival in 1989, and we quickly moved to address problems in two areas. Last year, after experiencing computer crashes and problematic power availability, we installed new electrical service to our main administration building, the Hunnewell Visitor Center. With an increase from 200 amps to 800 amps, we greatly enhanced the capacity of our electrical distribution system.

A second project involved major improvements in the security of our facilities. As part of the new electrical service contract, we incorporated exterior site lighting, including twelve Victorian lamps and lampposts that will afford much better visibility for both evening students and staff. In addition we upgraded our entire security system within the administration building to provide greater protection for the historic collections in the library.

The Arboretum also initiated planning for two major projects to be implemented in the near future. Five fuel oil and gasoline tanks, all over twenty years old, lie buried on the grounds. They will have to be removed and exchanged for more environmentally sound replacements. Any contaminated soil will require proper disposal.

Our main administration building, which is nearly a century old, will need a major renovation involving an upgrade of internal utilities such as electricity, plumbing, phones, and climate control. Interior spatial reconfigurations should provide better working conditions for our staff. Thus a full renovation plan will become an integral part of a future master plan for the institution.

The Arnold Arboretum is also the somewhat ambivalent owner of eleven houses (as well as several barns), and many of these were used to house staff in the past. Some of these dwellings are in considerable disrepair, and most have lead paint and asbestos insulation. By and large, they no longer directly serve the mission of the organization and would be better off in the hands of owners who will give them the care they deserve. Over the course of the next several years, we will be selling these houses. We will retain the option for repurchase at some point in the future.

In addition to these houses, the Arboretum owns several large parcels of land in Jamaica Plain and Weston; how these holdings relate to our mission is unclear. As part of a master plan, we will be evaluating these lands to define better their importance for our future. One parcel of particular interest is a tract of wetlands, partly owned by Harvard University and partly by the City of Boston, which lies between the Arboretum and the Forest Hills subway station. We are actively working with the City to integrate this rather derelict parcel into the Arboretum. Called the Stony Brook Marsh, it could become an urban wildland that would complement the more formal Olmsted design of the main Arboretum grounds.

Finances

For directors, the numbers usually tell all. With an organization as complicated as the Arnold Arboretum, an accountant's statement might hide more than it reveals. Therefore, I have created a simplified rendering of the income and expenses of the Arnold Arboretum over the past three fiscal years (Harvard's fiscal year ends on June 30). Clearly, such simplification can also disguise specific complexities, but I think that some generalizations become evident.

First, approximately 60 percent of the Arboretum's income derives from its endowment. Membership/gifts (including both the membership fee, individual contributions, and gifts from corporations and foundations) bring in less than 10 percent of our income, and this has declined since 1987-1988. Income from enterprise activities (rentals, sales of plants, the bookstore) has been slowly increasing. While grant support has remained relatively constant, our education program has grown dramatically in the last year.

Since education, grants, and our enterprise activities usually bring in income just sufficient to pay what they cost, our two real sources of growth to keep pace with inflation are investment income through the endowment

| | FY1988 | FY1989 | FY1990 |
|----------------------------|------------------|------------------|------------------|
| INCOME | | | |
| Endowments | 1,810,381 | 2,118,173 | 2,251,906 |
| Membership/Gifts | 380,557 | 312,979 | 317,546 |
| Enterprise | 230,542 | 239,603 | 270,211 |
| Grants | 418,152 | 438,973 | 416,298 |
| Education/Publications | 167,544 | 176,107 | 263,970 |
| TOTAL INCOME | 3,007,176 | 3,285,835 | 3,519,931 |
| EXPENSES | | | |
| Salaries | 1,624,251 | 1,687,133 | 1,827,431 |
| Supplies/Equipment | 330,840 | 564,340 | 550,794 |
| Facilities/Operations | 316,325 | 383,971 | 384,164 |
| Services | 468,232 | 450,851 | 351,079 |
| Travel | 35,402 | 42,214 | 43,511 |
| TOTAL EXPENSES | 2,775,050 | 3,128,509 | 3,156,979 |
| Unrestricted Excess | 2,238 | 112,996 | 112,044 |
| Restricted Excess | 229,889 | 44,329 | 250,909 |
| TOTAL EXCESS | 232,127 | 157,325 | 362,953 |
| TOTAL FUND BALANCES | 646,325 | 926,816 | 1,300,478 |

and gifts through philanthropy. Unlike many public botanic gardens, we receive no income from admissions and no direct subsidy from city or state government. It is worth noting, however, that we receive many services from Harvard University for which we do not pay and which do not appear in this accounting.

Recent growth in expenses (salaries, supplies/equipment) reflects a change in the institution from several years of financial stringency to a period of focused expenditures. We have tried to address issues of deferred maintenance, we have reviewed and adjusted staff salaries, and we have increased staff in critical areas such as the Living Collections. Our equipment inventory has expanded, especially through computerization and replacement of aging vehicles and mowers for the grounds crew.

Since our income funds are often restricted to specific purposes and may be received as grants or gifts well before they are expended, the *unrestricted* excess of income over expense is a better measure of the operational performance of administration. As you can see, we have done well in the last two years in generating a net operating surplus.

A better measure of the overall financial health of the institution is our total accumulated balance in our several funds (Unrestricted Fund, Restricted Fund, Restricted Gift, Building Reserve). These Total Fund Balances provide us with the reserves required to address many of our existing problems, to weather the recessionary winds of our near- future economy, and to begin to plan our programs for the next quarter-century and beyond.



Planning

One of my first accomplishments upon arriving was to initiate a planning process that would address some long-standing landscape and facility issues, clarify our future goals in light of a new mission statement, and provide a vehicle for communicating these goals to the many constituencies who care deeply about the Arboretum. To this end, I established several internal staff committees who have been meeting regularly throughout the past year. The reports of these committees will be fused into a programmatic document to form the basis of our work with an external consultant.

After interviewing a number of landscape architectural firms, we have chosen to hire Sasaki Associates of Watertown, Massachusetts, because of their extensive experience with historical and modern landscape problems and the breadth of expertise they will bring to the planning process. Although we will not begin working with them until spring, our internal staff meetings have generated a number of interesting ideas, which I would like to share with you below.

Living Collections

The management of the living collections will continue to be the first priority of the Arboretum. Planning has largely concentrated on a comprehensive review of our collections policy. We are focusing special attention on geographic areas and taxa of particular value for research and education. We will be organizing future collecting expeditions, and our historical interest in Asian species will continue to grow.

By its very nature, research with the living collections will always be somewhat opportunistic as we respond to the needs of collaborating scientists for appropriate plant material. We will always provide exceptional service, both through propagation and through our meticulous record-keeping system. In addition, staff members will continue to receive support for their own personal research on various horticultural projects of interest.

Two promising areas of research collaboration will be explored in the coming decade. We will expand our work with the National Cancer

Institute to inventory variation in taxol concentrations in our collection of yews (*Taxus*) and related species. We hope to identify promising candidates for further research and production. We can anticipate growth of similar programs surveying the pharmacological properties of closely related taxa for which extensive records have been maintained.

A second area of great interest involves the use of the collections for studies in molecular systematics. Our understanding of the evolution of plant families is undergoing a major reassessment. DNA, the basic genetic material used in such works, can be isolated from the chloroplast or nuclear genomes found in living plant tissue. Our diverse collections of closely related taxa of known wild origin will greatly enhance the possibilities for fundamental studies of the phylogenetic history of plants. We are discussing an ongoing collaboration with Dr. Robert Jansen at the University of Connecticut whose students have a special interest in the molecular evolution of species in the Berberidaceae, Ranunculaceae, and Oleaceae. With the completion of the verification project and recent publication of our plant inventory, we anticipate growing requests for living plant material to support molecular research.

While such research with the living collections is often funded by grants from federal and foundation sources, it is greatly enhanced through our Katherine H. Putnam Fellowship program, thanks to generous support from the Putnam family. In 1991, for instance, Dr. Michael Dirr will be spending a sabbatical at the Arnold Arboretum as a Putnam Fellow. We hope to establish a permanent endowment to continue such work with the living collections.

Research Programs

Our recently created Center for Asian Botany offers immense promise for new research programs at the Arnold Arboretum. Building on our long tradition of work in Asia, the Center will directly address current concerns about the impending loss of tropical biodiversity. Three broad areas of focus are emerging.

First, we will strengthen our collaboration with Chinese botanical institutions through the "Flora of China" project to translate and revise the multi-volume work that describes one-eighth of the flora of the world. Just this past September, for example, fifteen visiting Chinese scientists came

to the Arboretum with other members of the editorial board from the Missouri Botanical Garden and the California Academy of Science. We will continue to encourage the active training and exchange of scientists between this country and China.

A second initiative involves a recently signed cooperative agreement with the Herbarium Bogoriense in Bogor, Indonesia, to develop a sister institution relationship. Through this agreement we will build on our current collaboration with the National Cancer Institute to identify tropical plants that produce phytochemical substances with anti-AIDS and anti-cancer properties. This new program will lead to expanded botanical inventory and database development to create a more comprehensive survey of the tropical forests of Kalimantan, in Indonesian Borneo. This major center of tropical biodiversity is in critical need of conservation planning before indiscriminate logging destroys its forests. Our botanical inventory is a necessary first step. We will also be actively involved in training Indonesian scientists in biological resource management and conservation ecology.

Under the leadership of Professor Peter Ashton and in collaboration with the Harvard Institute for International Development, a third major program will establish long-term management research sites in the tropical forests of seven Southeast Asian countries. Through cooperative arrangements with Asian scientific organizations, these research stations will provide extensive data on forest dynamics under controlled and experimental conditions. Combined with related socio-economic research, these data will also lead to guidelines for the sustainable management of these forests to conserve their long-term value for the people in these developing countries.

Through the Center for Asian Botany at the Arnold Arboretum, we hope to promote the application of basic botanical and ecological research to the solution of critical problems in international conservation. We are actively seeking endowment funds to support the work of the Center.



In September, members of the "Flora of China" project met at Jamaica Plain. Photo by I. Ràcz.

Public Programs

In planning for public programs, we will build on existing resources and move in two new directions. We seek to professionalize some of our current educational offerings by identifying particular audiences seeking mid-career training. One such audience consists of professional designers and managers of open space landscapes, including park superintendents, corporate and campus grounds managers, and landscape architects. We would offer training in environmentally and economically sound practices for the design, establishment, and maintenance of plant materials in public spaces.

Elementary school teachers form a second audience in great need of training assistance, particularly with the teaching of science to children. We will expand our current children's program to incorporate the dissemination of the LEAP (LEarning About Plants) curriculum developed at Cornell University. By training teachers in this new approach, we will use plants as a friendly medium to enhance the learning of science.

A second direction for public programs will emerge from a collaboration with the National Park Service in conjunction with their responsibilities for the Frederick Law Olmsted homesite in Brookline, Massachusetts. Through a cooperative agreement, we will exchange our propagation, taxonomic, and horticultural expertise for their assistance in the creation of interpretive experiences for visitors to the Arboretum. Tentatively called "Changes in the New England Landscape," this program will incorporate themes such as the ecological history of the land, native Americans, the European exploitation of natural resources, the Sargent/Olmsted park tradition, and our current concerns with the conservation of biodiversity. I think this collaboration with the Park Service offers exceptional promise for greatly enhancing the public's enjoyment of the living collections.

Administration

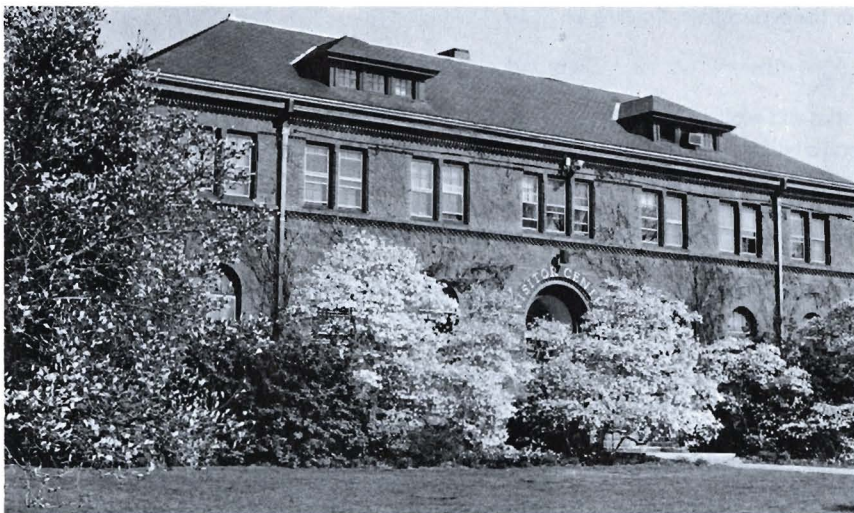
Two goals are of critical importance for the future of the Arboretum. First, our administration building, the Hunnewell Visitor Center, is in need of a significant upgrade in its basic systems, such as electricity, plumbing, phones, and climate control. Since 1992 is the centenary of the building, this occasion would make an excellent point of celebration for conclusion of a comprehensive renovation.

Our second administrative goal will be the successful development of a program to secure major gifts for shoring up the endowment of the institution. We will be part of Harvard's upcoming capital campaign, and I am working closely with the Development Office of the University to position the Arboretum for this challenge. Because of the great loyalty to and love for the Arboretum among our many friends, I am optimistic that we will be successful in achieving our goals.

Clearly, the continuing assistance of our membership will hinge on the soundness of our management and the promise of the ideas previewed above. In a single document, the forthcoming *Master Plan for the Arnold Arboretum*, we will define the scope of this promise to give us all a set of ambitious goals for the future. We deeply appreciate your encouragement and look forward to our growing partnership with you as the new century approaches.

A handwritten signature in black ink that reads "Bob Cook". The signature is written in a cursive, flowing style with a long horizontal line extending from the end of the name.

Robert E. Cook, Director
20 November 1990



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Staff of the Arnold Arboretum*

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* as of December 1990

THE MISSION OF THE ARNOLD ARBORETUM

The Arnold Arboretum is held in trust by Harvard University according to the terms of the Indenture of Trust of 1872. This legal document provided for the creation of the living collections as a practical demonstration of the variety of plants that could be grown in this climate. It also mandated the appointment of the Arnold Professor to manage the Arboretum and to teach the knowledge of trees and related topics.

Although there have been many significant changes in the fields of botany and horticulture and the Arnold Arboretum itself has fulfilled many different purposes during the past century, the basic premises of the Indenture still hold. It is most appropriate to reemphasize the traditional strengths of the Arnold Arboretum through a strong focus on botany and horticulture.

The mission of the Arnold Arboretum may be outlined as follows:

- (1) to develop, curate, and maintain a well-documented collection of living woody plants from around the world that are hardy in the Boston area;
- (2) to study these plants and their relatives and associates in nature through the maintenance of a herbarium and library and through directly related research in botany and horticulture;
- (3) to provide instruction in botany, horticulture, dendrology, and other fields related to the living collections.

As part of the City of Boston's park system, the Arboretum's Jamaica Plain site functions as an outdoor museum open to the public. The highest priority of the Arboretum's administration is the proper curation and maintenance of these living collections. Proper curation includes acquisitions through field expeditions and exchanges with other institutions as well as cultivation and propagation of existing specimens to enhance and maintain the scientific and instructional value of the collections.

The second priority of the Arboretum, the study of its collections and their relatives and associates in nature, directly benefits the curation of the collections. The preserved collections and the library are indispensable tools for this research, and their curation and maintenance are therefore essential. All of the Arboretum's resources—the living collections, the preserved collections, and the library—are available for scholarly research. The director of the Arnold Arboretum is responsible for ensuring that adequate and up-to-date materials are available for present and future scholars to teach and to pursue research in the areas represented.

Educational programs are the Arboretum's third-highest priority. The Arnold Arboretum offers a variety of programs for public instruction in horticulture, botany, dendrology, and landscape gardening and, in addition, disseminates knowledge of plants through its publications. The director and Arboretum professional staff may also offer courses, as appropriate, within other academic programs of Harvard University.

—Document approved by the Harvard Corporation, February, 1988

