

Woody Plant Collections at the Morton Arboretum:

A HISTORICAL PERSPECTIVE

By Ray Schulenberg

At the main entrance stands a sign: THE MORTON ARBORETUM—Outdoor Museum of Woody Plants—JOY MORTON • FOUNDER 1922. The phrase “outdoor museum” directly quotes the Founder’s words in the document which established the Arboretum: “. . . a great outdoor museum arranged for convenient study of every species, variety, and hybrid of the woody plants of the world able to support the climate of Illinois . . .” These words and others in the founding indenture make it clear that Mr. Morton visualized a comprehensive collection of living woody plant specimens, so placed as to be accessible and meaningful to the public. In 1980, fifty-eight years after this document was signed, the institution’s present personnel are still striving to fulfill these basic goals of the Founder—by no means an easy or simple task.

A visitor to the Arboretum, after reading the entrance sign, sees little further evidence that he is in a “museum.” Only a few of the plantings have a self-explanatory meaning, like an exhibit. Most of the collected specimens are dispersed throughout an informal landscape, park-like and pleasant. Indeed the majority of visitors think of the Arboretum as a park, and enjoy it as such.



Arboretum staff and craftsmen erect a new sign at the main entrance off Illinois 53.

Yet, within this park-like landscape, there are extensive collections, as in a museum. In fact, as of July, 1980, the collections (defined as all the woody plants on which our collections personnel keep some kind of records) include plants being grown under 3,874 different names, and under 8,300 accession numbers, representing acquisitions dating from every year of the Arboretum's existence. There are perhaps 40,000 individual specimens that can be considered collections items. Twelve employees spend most of their working hours in some phase of the collections program—planting and field maintenance, record-keeping and labeling, propagation, taxonomy, administration, and clerical work. Several other Arboretum employees are involved part of the time with collections specimens and activities.

Since most visitors enjoy the Arboretum without any awareness of its collections, one might well question whether there is any need to acquire this diversity of plant materials and invest so much time and energy in maintaining it. It would be far easier and less costly to plant and maintain a landscape consisting of a few dozen hardy, fast-growing trees and shrubs readily available from local nurseries, responsive to the landscape architect's art, and requiring little care. But the Trustees and Staff think that, aside from an obligation to comply with the terms of the indenture, there are several valid, practical reasons why the Founder's original concept of a collection is relevant to our time and to the future.

One obvious justification for a comprehensive collection is the "Noah's ark" concept. Man's exploitation of the earth's surface is modifying habitats so destructively that many woody species will eventually be eliminated as wild populations, and will survive, if at all, only in cultivation. Since many of these species do not have known economic values, their survival will depend on cultivation in collections. From this point of view, there is an

urgent need for extensive plant collections to be maintained in many parts of the world. Some of the species so preserved may turn out to have values not now perceived, but even if they do not, many people now think that preserving a species is a worthy end in itself. Of course many of the plants in our collections do have ornamental values already recognized. It is our responsibility to make specimens available to the landscape-conscious public for their evaluation, to the student of horticulture and landscape architecture for gaining familiarity, and to the nurseryman for propagation. A collection is a resource for learning many aspects of botany, such as taxonomy and phytogeography. But perhaps one of the highest values of a collection like ours is the joy it gives to the increasing number of people who appreciate the beauty and significance of diversity in the natural world.

A valuable service rendered by an outdoor plant collection is demonstrating the nature of the local climate. While one kind of plant thrives here and reaches great size and age, another kind dies during even the mildest winter; still another is killed only by a very severe winter, while yet another survives winters but succumbs to summer heat and drouth. One kind thrives in compacted glacial clay, while others grow only in soil modified by addition of sand or peat. The cumulative sum of recorded observations on a wide spectrum of woody plants at the Arboretum gives a picture of our local climatic and soil conditions that is as meaningful as statistics recorded by sophisticated measuring instruments.

Even though the Arboretum's woody plant collections are not highly conspicuous in the visible landscape, they are of central importance to the work of the institution. Their role can be better understood in the context of the historical development of the Arboretum.

The 1,500 acres that now make up the Arboretum grounds were acquired and dedicated to Arbo-



Florida corkwood, growing here far north of its range, is the only plant in its family.

retum use in numerous parcels and over a long period of time. The original acreage was irregular in outline, and the early plantings were sited among woodlots, in old fields, along streams and roadways, and around the buildings and plantings of the Morton residence which the family occupied until 1940. Additions were made in an unpredictable pattern as land became available. Under these conditions it would have been difficult to conceive a master plan in which collections would have been arranged according to an overall concept.

The initial vision for transforming the existing scene into an arboretum was that of Ossian Cole Simonds, whom Mr. Morton engaged as advising landscape architect in 1921. His firm, Simonds and West Landscape Company, was based in Chicago. Mr. Simonds supervised the excavation of Lake Marmo and Lake Jopamaca in fall of 1921, and also the first landscape plantings in spring of 1922. He

directed these planting operations without drawn plans. One can gain insight into the philosophy which influenced early developments on our grounds by reading Mr. Simonds' book *Landscape Gardening* (The Macmillan Company, N. Y., 1920). He believed in creating naturalistic landscapes, in which the landscape artist's hand is concealed rather than evident. To him, recognizable geometric figures in the landscape were unacceptable.

Much of the early work of excavating, grading, and planting was supervised in the field by Clarence E. Godshalk, a graduate of the University of Michigan in Landscape Design, who came to work here in fall of 1921 as an employee of Simonds and West. After a time he began working directly for Mr. Morton. He soon became the Arboretum's Superintendent, and eventually its Director. Mr. Godshalk also placed great emphasis on the esthetic aspects of the Arboretum with similar appreciation of informality in design. Mr. Godshalk's ideal of the "landscape arboretum" became the guiding philosophy in the development of the grounds. By the time of his retirement in 1966, this concept had become permanent policy, confirmed by the Trustees and by the present Director, Dr. Marion T. Hall, who succeeded Mr. Godshalk. Anthony Tyznik, our Landscape Architect, who worked under Mr. Godshalk starting in 1954, continues to implement the vision of a landscape arboretum.

Acquisition of collections as such got under way in 1922. Mr. Morton had already been in consultation with Dr. Charles Sprague Sargent, Director of the Arnold Arboretum in Massachusetts, in regard to living woody plants, the library, and the herbarium. Therefore, when John van Gemert, who had a background of nineteen years in horticultural work, began his duties as our Propagator, he reported for work first at the Arnold Arboretum. There, in February, he collected a large number of cuttings. In March he stopped at Rochester, New

York, where he also collected cuttings in the extensive plantings of the Department of Parks. He arrived in Lisle on April 1. Although a great deal of the mass planting of 1922 and later was done with nursery stock that was not documented, Mr. van Gemert maintained an accurate record of the acquisitions for which he was responsible, beginning with number 1–22, the first lot acquired in 1922. During the first year his recorded acquisitions numbered to 3137–22. Mr. van Gemert propagated plants vigorously and successfully for the Morton Arboretum until the short illness that ended his life in 1942.

On July 1, 1922, Henry Teuscher began working for Mr. Morton as Botanist. He was of German birth, had an advanced diploma from the Berlin-Dahlem Botanical Garden (noted for its geographical groups), and had years of horticultural experience in Germany. Like Mr. van Gemert, Mr. Teuscher did his first work for Mr. Morton at the Arnold Arboretum, where he collected and selected herbarium specimens that were the beginning of the Morton Arboretum Herbarium. In many cases Mr. Teuscher's herbarium specimens vouchered propagules collected by Mr. van Gemert. Teuscher came to Lisle on January 1, 1923.

From the acquisition Journal kept by Mr. van Gemert, it is evident that he and Mr. Teuscher, in addition to acquiring the landscape materials called for by O. C. Simonds and Clarence Godshalk, were interested in developing a comprehensive collection of living woody plants hardy in our area. Drawing up a list of *desiderata* would have been difficult at that time, because Dr. Alfred Rehder's *Manual of Cultivated Trees and Shrubs* was not published until 1927. However, both van Gemert and Teuscher had the advantage of personal acquaintance with Dr. Rehder, who was Curator at the Arnold Arboretum.

In 1923, "one of the first tasks given Mr. Teuscher was to list and arrange plants for various

botanical groups, the locations of which were decided upon by Mr. Morton, Mr. Godshalk, Mr. van Gemert, and Mr. Teuscher. Among some of the main groups started in that year were the Old Lilac Collection, Prunus, Ligustrum, Spiraea, Cornus, Pyrus, Forsythia, Caprifoliaceae, Salix and Populus Collections. . . ." These words, from unpublished notes of Mr. Godshalk, describe the beginnings of plantings made here specifically as collections, as distinct from landscape groupings. In 1924 the hawthorn collection, Japanese Island, and the European Group, among others, were added, and in 1925 the rest of the geographic groups along the river were planted. Mr. Teuscher's blueprints for the geographic groups are still in our archives. The elm group was planted in 1926. During the years 1923–28 many other tree and shrub groups were planted, and also most of the forestry plots. The latter were mass plantings of single species in rows for the purpose of measuring the productivity of various trees as possible timber crops suited to northern Illinois.

In 1923 Mr. Teuscher made a floristic survey of the Arboretum, including all the spontaneous vascular plants he could find, both woody and herbaceous. He had the list printed and distributed to botanical gardens and arboreta throughout the world. Mr. Teuscher offered to send propagules of any plant on this list in exchange for plant materials on the exchange-lists of these sister institutions. Since that time we have been engaged in this traditional exchange, and our collections continue to grow because of it.

Mr. Teuscher left the Morton Arboretum early in 1929. Soon after his departure the Arboretum hired E. Lowell Kammerer, who had a B.S. degree from the University of Illinois in Landscape Architecture, and came here just after graduation. He remained with the Arboretum until his death in

Opposite: Scots pine, white birch, beech, and Norway spruce give character to our European Group.





1966, in later years holding the title Curator of Collections. Mr. Kammerer helped plan the Hedge Garden, among many other groups. He was most interested in plant materials useful for landscape purposes and wrote great numbers of articles pointing out the ornamental values of the various plants. These were published in the Arboretum's *Bulletin of Popular Information*, and are still in demand.

In 1931 Walter E. Eickhorst began work for the Arboretum maintaining records on the planted woody plants and keeping them labeled. In time he developed a grid system for locating specimens on the grounds. He worked very closely with Mr.

Above: Display labels help to introduce plants to visitors in the Dwarf Shrub Garden.

Kammerer, and together they are responsible for some of the Arboretum's outstanding extant collections, including the Rhododendron Beds and the Dwarf Shrub Garden. Both men were interested in acquiring a wide assortment of ornamental cultivars. Mr. Eickhorst also took the responsibility of perpetuating the stock of selected accessions by noting mortality or decline, and calling for propagation when needed. Mr. Eickhorst had the title Curator of Cultivated Plants until his retirement in 1977.

The seed-exchange program was the responsibility of the Propagator, and when Mr. van Gemert died in 1942, this function was turned over to the new Propagator, Roy M. Nordine. A member of a Minnesota nursery family, Mr. Nordine had a background in commercial nursery work, and was our Propagator until his retirement in 1970. In addition to perpetuating and increasing plants already in our collections, Mr. Nordine was active, along with Mr. Kammerer and Mr. Eickhorst, in seeking a wide spectrum of new plant materials, through both the seed exchange and his many contacts with nurserymen and other specialists.

Although the collections remained nearly static during the World War II years, when some of our personnel were in service or in war industry, there was a tremendous upsurge in acquisitions during the late 1950s. By this time large new acreages of land had become available for collections use, partly through the termination of the Morton enterprise known as Lisle Farms, and partly through purchase. Notable additions at that time include the Johnson land at the northeast corner and the Lacey land along the south edge, fronting the East-West Tollway. Of the total plant accessions alive in early 1980, 28 percent date from the years 1955–1962, the years of development of the Shrub Collection, the Tree Evaluation Plot, new Crabapple, *Prunus*, and *Aesculus* groups, a great southward extension of the Gymnosperm collection, northward extension of *Acer*, and a new Willow group. With the addition of the Display Group in the early 1960s, the collections reached essentially the area coverage and locations they occupied until spring of 1980.

During the years 1968 through 1976 a great many of the accessions recorded in the Collections Journal were of plants acquired by individual staff

members for research purposes. Many cuttings of Cupressaceae rooted for Dr. Hall's research in cytotaxonomy thus became available for collections use. Large numbers of elms and other trees obtained for research by Dr. George Ware, our Dendrologist and Research Group Administrator, were also given collections accession numbers, since at that time the research program did not have a separate journal. During those years also some retroactive accessioning took place: The plants in the Display Group, developed during the early 1960s, were given 1970 accession numbers, and a large number of mature woody plants growing spontaneously on the grounds received 1971 numbers.

The landscape plantings during the early years of the Arboretum were so extensive that it would have been impossible for the small staff of those years to record and label all the specimens. In 1922



Right: The formal Hedge Garden contrasts sharply with Arboretum's generally informal aspect.

alone, when there were only two staff members, 138,000 plants were planted. Plants acquired for landscape use were not recorded until recently. Over the years, the landscape plantings have continued to be a major part of the Arboretum, containing conspicuously placed, attractive specimens, significant not only esthetically but botanically as well. Our Plant Recorder is currently working to trace the history of these plantings and to incorporate the plants into our record system.

Because the Founder's statements permit wide interpretation of collections goals, it has seemed appropriate to spell out these objectives more explicitly in the light of present day concepts of taxonomy and current environmental thinking. Thus, in 1977, by consensus, a fairly articulate set of guidelines had been formulated. In that year, as part of a general reorganization of Arboretum administration, the living plant collection functions were placed in a Collections Program with Charles Lewis, Horticulturist, designated as Administrator.

The following are some of the present guidelines: All plants acquired for landscape purposes are regarded as Collections in terms of records and labels. Any plant acquired specifically for a research purpose is given a visually distinct accession number, and is recorded in a separate Research Journal begun in 1977. Collections personnel work toward a comprehensive outdoor woody plant collection, as representative, both systematically and geographically, of the woody plants of the world as our climate and soils permit. The emphasis is on products of natural evolution, propagules coming if possible from wild populations in native habitats. Since the number of species and geographical varieties is finite, the Arboretum may work toward acquiring all the woody plants in these categories that prove hardy here. By contrast, the quantity of man-made hybrids, cultivars, and other selections is literally infinite, and it is futile to consider ever acquiring "all" of them. Therefore we can be selec-

tive about getting plants in these categories, evaluating each on its own horticultural merits. We value real diversity above merely nominal diversity; the higher the level of classification, the more desirable the acquisition. To illustrate: We give high priority to establishing on our grounds a shrubby *Atriplex*, which would add not only a new species to our collections but a new genus as well, and even a new family. We give lower priority to adding one more cultivar of *Malus* or *Syringa*. We do wish to perpetuate the best of the cultivars we already have, and to add new ones of evident merit for our area. We cannot afford to test every new commercial introduction nor every plant fancier's selections. We are not obliged to accept any plant for which we do not have access to an adequate published description. Economic cultivars, such as commercial fruit and nut "varieties," are not a valid part of our collection.

While the Collections Program is expected to acquire and maintain a comprehensive collection of the world's hardy wood plants, the Research Program, on the other hand, specializes in the breeding and selection of such woody ornamentals as are of interest to individual research personnel. Any desirable plant generated by such research can, of course, be reaccessioned for collections.

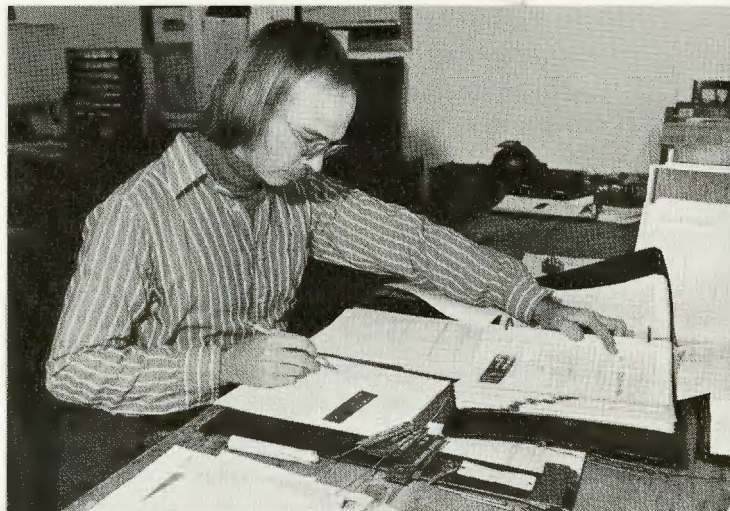
Acting within the above guidelines, our most urgent need is to achieve a better representation of species and geographical varieties. A study of the world's woody flora in terms of our climatic limitations suggests that as many as 2,800 woody plants of species and varietal rank could survive here. By July of 1980 we had positively identified specimens of about 772 of these, or 28 percent. In order to increase our representation, we are not only focusing our acquisition efforts on new botanical materials, but are also trying to provide special

Opposite: The Plant Recorder has more than 58 years of documentation within reach in his office.

habitats, by siting and by soil modification, to accommodate greater diversity.

Another urgent job for the Collections Program is identifying the plants we already have. The public tends to assume that the plants in an institutional collection are just what their labels say they are. Such is not necessarily the case, and it is the ongoing task of our Taxonomist, Floyd Swink, to determine the true identity of woody plants on our grounds. As of July 1980, out of the 3,874 names in our collections, we had positively identified specimens of 1,614 kinds of plants, including cultivars.

Keeping records on our collections is the full-time job of our Plant Recorder, Ed Hedborn. The following brief summary of our records system may be useful to interested students. The Journal is a bound, ruled-paged book in which each lot of plants (also called accession or acquisition) is numbered and recorded in the sequence in which it is received, with full data as to source. The alphabetical Live File contains a white 3" by 5" card for each living accession, with brief history of the lot; each white card is followed by a yellow card which gives the present location of the specimens, including grid coordinates where available. The alphabetical Dead File holds the white cards of accessions of



The Label Specialist's job calls for skill with words and numbers and a keen sense of direction.

which no specimen survives. The Ledgers are post-binders organized according to the grid, in which are plotted those plants that have been located on the grid. The Field Inventories are loose-leaf, each covering a specific area within the Arboretum; the plants within each area are checked every third year, and the data so obtained go onto the yellow cards and eventually into the Catalog. The Catalog is alphabetical, in ring-binder format, completely rewritten every third year: It lists each lot, with brief history and present locations. Mimeographed copies of the Catalog are distributed to all interested employees, and are available for use by the public in the Library and Visitor Center. Our records are also submitted to the Plant Sciences Data Center at Mount Vernon, Virginia, and are computerized there and made available to the horticultural community.

Keeping our living specimens labeled is the full time job of our Label Specialist, Chad Avery. Relatively few of our specimens have display labels, which are now being made by the Metal-Photo process. However, we try to keep all collections

plants labeled with the standard collections labels—copper strips just over an inch wide and as long as necessary to give the name of the plant, the accession number with an abbreviation indicating how the material was received, the location if the plant is within a surveyed grid, and the letter S if the specimen has been found true to the name it bears. The collections label is placed on the south side of the plant, attached in a manner appropriate to the size of the plant (nailed to the trunk, wired to a branch, or on a metal stake).

The grid is based on squares 100' by 100' which are designated by coordinates. The south-to-north axis is ordinated by letters, and the west-to-east axis by numbers. Within any of these squares, a plant is located by numerical coordinates expressed in feet, first from the south edge of the square to the north, and then from the west edge to the east. (Old labels give these figures in tens of feet, but

they are being replaced.) The corners of the 100' squares are marked by inconspicuous plain concrete posts, their tops at ground level or even buried; in order to find a specimen, it is necessary to use as reference points the labels of other nearby plants.

The contents of our collections are listed in our Catalog, which is available to the public, and will be only touched upon in this short article. The 1,614 determined taxa break down as follows: 801 cultivars, 679 species (typical, with binomials), 93 geographical varieties, 44 hybrids (with X binomials), and 24 *formae*. A more significant figure is the number of genera. As of July, 1980, woody plants established on our grounds—having spent at least a full year in their present site—represented 252 genera, a net increase of ten percent over the 1977 figure. With the possible exception of a single barberry plant from Patagonia, all the plants in our

The Propagator gives our woody plants a good start under carefully controlled conditions.



collections are derived from the woody flora of the North Temperate Zone.

During the early years of the Arboretum large numbers of plants were obtained from commercial nurseries. At present our acquisitions are mostly from (1) the vegetative increase of identified specimens already on our grounds, (2) seeds received from our sister institutions, but collected from wild populations, and (3) seeds collected from native stands by our own personnel on field trips. The work of raising plants until they can be placed in their permanent sites on the Arboretum is in charge of our Propagator, Wesley Wilson. For this use we have greenhouses, walk-in coolers, and the other usual facilities of a nursery.

Maintaining the living collections is an endless and complex procedure, about which a book could be written. We have mentioned keeping the plants inventoried and labeled. We also need to remove dead wood and control insects and disease. But by far the most critical aspect of maintenance is helping the woody plant specimens survive the competition of weeds, including annual, biennial, and perennial herbaceous weeds (not least of which are the turf grasses!), and woody weeds—trees, shrubs, and vines.

The arrangement of collections on the grounds was to a large extent set by the growth pattern of the Arboretum. The unforeseeable pattern of land acquisition precluded the development of an overall plan or concept in their placement—such as a taxonomic system or world geography groupings. They were originally placed wherever land became available at the time of planting. There is no possibility for an immediate massive realignment of collections so as to carry out an integrating theme. Nevertheless, within our limitations, we are working to fulfill the Founder's directive to make the collections more "conveniently arranged for study." Ideally we would like to present each species and geographical variety both in a system-



The extensive Hedge Collection is the responsibility of one of the Arboretum's Gardeners.

atic group (showing its taxonomic affiliations), and in a geographical group (representing the land where it is native). We would like for each of these groups to be visually recognizable as a meaningful, comprehensible entity, and yet blend with the landscape concept.

Integration of collections and landscape, within the ideal of the landscape arboretum, is accepted practice at the Morton Arboretum. Collections personnel consult with the Arboretum's Landscape Architect, Mr. Tyznik, in all changes and developments on the grounds—site selection, removal of woody plants, soil modification, and especially the planting of individual specimens. Mr. Tyznik then determines the location for each plant within the site agreed upon for a particular group. There are challenges to the creative artist in trying to develop an esthetically pleasing landscape using the plant materials of a comprehensive collection—of the Leguminosae, for instance, with all their diversity



White wooden stakes, like these in the Thuja Group, are temporary markers for new plantings.

of size, habit of growth, longevity, and site requirements. A collection cannot be planned and planted as a unit, but rather must be developed over perhaps a decade, as plant materials become available. Furthermore, in our case the site may already contain specimens not pertinent to the new group, but too valuable to discard.

Major developments in collections must of course be consonant with the philosophy of the Arboretum's Director and Board of Trustees. In addition, collections personnel consult members of the Education Program and the Research Program to make sure that proposed changes are harmonious with their concepts and plans.

During the spring planting season of 1980 we

made noticeable progress both in rehabilitating old collections and in developing new ones. These plantings promote the Arboretum's goals both by greatly increasing the number of kinds of woody plants represented, and by placing these plants in meaningful groupings as in a "great outdoor museum." At the same time the input of the Landscape Architect insured that the ideal of the landscape arboretum was enhanced by these plantings. We are working steadily to achieve the basic goals set by our Founder, Joy Morton. Building upon the accomplishments of our many talented and dedicated predecessors, we are making perceptible gains. After all, we are only 58 years old, rather youthful even in the life of a single tree!

