Contents

The Hellebores 1
RICHARD E. WEAVER, JR.

The Raisin Tree — Its Use, Hardiness and Size 7
GARY L. KOLLER and JOHN H. ALEXANDER III

The Allegheny Pachysandra 16
MICHAEL A. DIRR and JOHN H. ALEXANDER III

Notes From the Arnold Arboretum: The Gift of Time 22
MARGO W. REYNOLDS

Arnoldia Reviews 26

ARNOLDIA is a publication of the Arnold Arboretum of Harvard University, Jamaica Plain, Mass. 02130

Published six times a year: in January, March, May, July, September, and November.
Subscriptions $8.00 per year.
Second Class postage paid at Boston, Mass. Copyright © 1979 by the President and Fellows of Harvard College.

JEANNE S. WADLEY, Editor MARGO W. REYNOLDS, Assistant Editor

Cover: Helleborus niger. Photo: R. Weaver.
The Hellebores

by Richard E. Weaver, Jr.

Helleborus is a genus of the Crowfoot Family (Ranunculaceae) including about twenty species native to southern Europe and western Asia. Several species, particularly H. orientalis, the Lenten Rose, have been cultivated as medicinal plants since classical times, and they are still important plants in modern gardens because of their beautiful, often oddly colored flowers which appear in winter or early spring, and their bold, handsome foliage.

Like many members of the Crowfoot Family, the showy parts of the flowers of the hellebores are sepals rather than petals. These are generally five in number, and they vary in color from green or white through pink to deep red-purple. The petals are reduced to a ring of nectaries which are mostly obscured by the very numerous and conspicuous bright yellow stamens. The flowers often remain fresh and functional for nearly a month, but they remain on the plants for a much longer period, the sepals persisting and gradually turning green or purplish as the fruit matures.

Perhaps a dozen species and their various hybrids are cultivated in Europe, but only the following are generally available from American nurseries.

**Helleborus niger.** Christmas Rose

This is certainly the best known and most frequently cultivated species at present, and it is, in my opinion, one of the finest herbaceous plants of any sort that can be grown in New England. As the common name implies, the flowers are similar at a glance to those of a single rose, but unfortunately they are not fragrant. In England or their native southern Europe, the plants may bloom soon after Christmas. But in my garden the flowers have not appeared before early March, even though the buds, large and plump and perfectly formed, may be found just at ground level at the very onset of winter. When they do appear, the 2-3-inch flowers, pure white or with a tinge of pink, rising on short stalks above the magnificent, leathery, almost palmlike foliage, seem almost unreal in a world barely past the dead of winter.

Several varieties and cultivars are available in the trade. Those with particularly large flowers include var. altifolius and 'Potters Wheel'. The var. macranthus, often listed as a separate species, has
gray-green foliage and the flowering stems are seldom more than 8 inches tall.

Although I can never quite bring myself to cut one, the flowers of the Christmas Rose reportedly last very well when they are brought into the home, at least if the stalk is slit at the base. Outdoors they can usually take the worst March has to offer, but the often recommended practice of protecting them with a basket will, at least, prevent them from being hidden for even a few days by that inevitable snowstorm.

**Helleborus orientalis.** Lenten Rose

The Lenten Rose is native to Greece and Asia Minor, but it and its hybrids appear to be quite hardy in the Boston area. It is more likely to live up to its common name than the Christmas Rose, and normally blooms here with the early daffodils in April or early May. It is similar in aspect to *Helleborus niger*, but the leaves are larger (often a foot or more across), glossier, with finer and more numerous regularly spaced teeth. In addition, the flowering stalks are frequent-

*Left: Helleborus corsicus (as H. lividus), from Botanical Register, vol. 24, plate 54, 1838.*

*Right: Helleborus orientalis, from Botanical Register, vol. 28, plate 34, 1842.*
ly branched and bear conspicuous leaflike bracts. The flowers are creamy to brownish in the wild plant, but this is rarely seen in cultivation now. Most plants presently passing as Lenten Roses are actually hybrids with *H. orientalis* as one of the parents. Flowers range in color from apple green through pink to maroon. The so-called Millet Hybrids bear flowers that are frequently streaked reddish inside, suggesting the presence of the Caucasian *H. guttatus* in their ancestry.

Although they are fine garden plants with beautifully colored flowers, the Lenten Roses are not so refined as the Christmas Rose and must be sited carefully. They are rather large and informal, and they look best planted among evergreen shrubs. The large leaves, while remaining evergreen, are generally flattened to the ground with the first snowfall, and even a single-crowned plant may then be almost a yard across.
Helleborus foetidus, showing the habit of the plant, from H. Baillon, Histoire des plantes, vol. 1, 1867.

**Helleborus corsicus (H. lividus subsp. corsicus)**

This and the following species differ from the first two in that the flowers are borne at the tips of leafy stems rather than arising directly from the crown on naked scapes. Well-grown plants must be impressive and attractive, with their 12–15-inch stems bearing trifoliolate, sharply toothed and heavily veined leaves and crowned with a branched cluster of ten to twenty green flowers. But I have not
found *H. corsicus* satisfactory in my garden. Being a native of Corsica, it is not surprising that this species is a bit tender. I have had a plant survive the past two winters, but spring has found the stems weak and flattened and the flower buds mostly blasted. In areas without heavy winter snowfall, this is no doubt a very fine plant. Even here it might be satisfactory if it were protected with an overturned basket.

**Helleborus foetidus.** Stinking Hellebore

I have not grown this plant, but since it ranges into western Europe it should be one of the hardiest of the hellebores. It is rare in cultivation in this country, and at present I know of only one source — Lamb Nurseries in Spokane, Washington, which is, in addition, the only nursery that lists all the other three species discussed here. *Helleborus foetidus* is similar in aspect to the preceding species but the leaves are more finely divided and the green flowers are often rimmed with purple. As the Latin name implies, the flowers have an unpleasant odor; they appear in April and May. I suspect that *H. foetidus* also needs protection from the weight of the snow in winter.

Hellebores will not prosper unless they are planted in a good, deep soil that never dries out. Deciduous shade, or the shade of a house at midday is ideal. A few applications of a water soluble fertilizer during active growth in the spring are beneficial, and for best results the soil should be near neutral or slightly alkaline. These plants have a reputation for being difficult to transplant, some accounts stating that they will not flower for several years after being moved. If reasonable care is taken, and the long, thick roots are not seriously damaged, this reputation is unfounded. And of course, young plants move better than do mature ones. However, hellebores are highly susceptible to crown rot, so if they are to travel through the mail I would recommend ordering in the spring from a small specialty nursery. Plants from such an establishment will probably be young and either pot-grown or freshly dug.

Most hellebores are long lived and slow in increasing, so they seldom need division except for propagation purposes. Division can be done most anytime with proper care, and this is recommended over seed propagation because the seeds are often slow to germinate and the resulting plants usually take at least four or five years to flower.

Although all parts of these plants are probably poisonous, they should not be a problem in the home garden because there is little about them that would attract children.
The Raisin Tree - Its Use, Hardiness and Size

by Gary L. Koller and John H. Alexander III

Interest in unusual plants that produce edible parts seems to be on the increase. One such plant, almost totally unrecognized in Western literature, is the raisin tree (*Hovenia dulcis*) which in Chinese is known as Chih-chü. This Rhamnaceous plant derives its common English name from the enlarged and irregular flowers stalks that have been sold as fruits in the Peoples Republic of China since pre-Confucian times. These stalks are small and inconspicuous but they rapidly increase in size as the fruit matures. With maturation, and after frost, the pedicle color changes to russet and the interior of the stalk is filled with a yellowish pear-flavored pulp. Individually, the stalks are small, but abundant production compensates to produce bulk and this results in a crop that requires labor-intensive harvest techniques. The enlarged pedicle is unusual in that it is not part of the fruit structure but is entirely distinct and subtends the pendent terminal fruits. The ripe fruits are small, dry, rounded, three-celled capsules about the size of a pea. Each contains three flat, shiny black to orange-brown seeds. In China these seeds are sold under the name of Chih-chü-tzu.

From what these authors have been able to ascertain from the literature and through discussion with Dr. S. L. Hu, a Chinese botanist, the ripe pedicles are collected from the wild by small school children instead of being cultivated in orchards as a crop. If cultivars have been selected in the Orient, they are unknown to us. Perhaps commercial interest could be enhanced by the selection of plants with larger pedicles, higher sugar content, greater productivity or more reliable annual fruit production.

G. A. Stuart in *Chinese Materia Medica* says: "Both the fruits and the fleshy peduncles are considered to be antifebrile, laxative, diuretic and quieting to the stomach. Remarkable antivinous properties also are attributed to them. It is said that after the ingestion of large quantities of alcohol the use of this drug will prevent any intoxication or poisonous action. The bark of the tree is used in diseases of the rectum." K. C. Chang in *Food in Chinese Culture* states that hovenia is sometimes styled 'tree honey' in Chinese for the sweet extract of the seeds, bough and young leaves is a common substitute for bee honey.
This 53-year-old raisin tree (A.A. 19571) is the Arnold Arboretum's best specimen with a height of 35 feet and a spread of 22 feet. Photo: E. Gray.

H. F. Chow in The Familiar Trees of Hopei indicates that this is a valuable commercial species. In addition to food and medicinal use, its wood is hard and heavy, and is used for manufacturing furniture, etc.

As a wild population, this plant finds its native home in China, Korea and Japan, where it occurs in the warmer portions of these countries. In Japan it occurs on the Okushiri Island of Hokkaido as well as on the islands of Honshu, Shikoku and Kyushu. In China it is found in provinces of Hopei, Honan, Shantung, Chekiang, Hupeh, Hunan, Szechuan, Yunnan, Kweichow, Kwangtung and Fukien. Through cultivation the plant was introduced very early into India.

*Left above: Flower of Hovenia dulcis, from The Botanical Magazine of Tokyo, vol. 53, no. 635, 1939.*

*Below: Hovenia dulcis, from The American Garden, vol. 12, 1891.*
The Chinese literature lists *Hovenia dulcis* as growing to 30 feet with an equal spread. It is said to occur in shady glens in moist situations where it forms extensive thickets, and occasionally in the mountains as a secondary plant that occurs at altitudes ranging from 500 to 4,000 feet.

While this species was introduced into cultivation in the west in 1820, it remains little known even in many botanical collections. At the Arnold Arboretum two large trees are alive and thriving as of December 1978. The best specimen (A.A. 19571) was obtained as seed on December 24, 1924 from the Botanic Garden in Washington, D.C. When planted out in 1931, the tree was placed in an exposure of full sun on a southeast facing slope which is one of our warmest microclimates. In December 1978 at fifty-three years of age, this tree is approximately 35 feet tall with a spread of 22 feet. A single trunk divides at approximately 12 inches above the soil line into two major stems. The largest branch has a D.B.H. of 1 foot 1 inch, and the lesser a D.B.H. of 11 1/2 inches. The tree has a rounded head, strong u-shaped crotches, deep roots and no visible sign of dieback or breakage from ice and snow. Average stem growth was 12 inches for current year's wood. The 1978 growing season produced an abundant crop of seeds.

The second plant (A.A. 87-33) was collected on January 18, 1933 by W. H. Judd as seed from the Botanic Garden in Washington, D.C. It is interesting to note that the two surviving trees at the Arnold Arboretum both originated from the same seed source. This tree was permanently planted in 1937 near the first plant described, but instead of having an exposure of full sun, the plant is shaded and stretches for light. At forty-five years of age, this tree is approximately 30 feet tall but its spread has been greatly distorted by competition from neighboring plants. The D.B.H. of the single stem is 10 1/2 inches. No fruiting is evident for the 1978 season.

The earliest accessions of this plant at the Arnold Arboretum were in 1880 when seeds were received from the Agricultural College in Sapporo, Japan, and a plant was sent from S. B. Parsons and Sons, a nursery in Flushing, New York. None of these plants survives but the early records do not indicate the reason for failure.

Three specimens exist in December 1978 at the Morris Arboretum in Philadelphia, Pennsylvania. One is a towering giant (M459) with a height of 78 feet and spread of 68 feet. This tree has an interesting history as related by Joseph Adams of the Arboretum staff. When he started work at the Morris in February 1933, the tree was already a large specimen of at least 30 feet in height, but the records lacked a source or age for the plant. The winter of 1933-34 was devastating with gusting winds and a record of −17°F. The tree froze back to within a few feet of the ground. However, it recovered by sending out vigorous shoots from the main trunk and in 1942 after eight growing seasons, attained a height of 31 feet and a spread
of 35 feet. So its present height of 78 feet was achieved with the backing of a strong, well-established root system, in only forty-five years. This tree has two trunks that divide from a single stem at approximately 1 foot above the soil line. The east trunk has a D.B.H. of 2 feet 4 inches and the west trunk a D.B.H. of 2 feet. Mr. Adams only can remember the tree fruiting twice, with the last time being approximately 1975.

As with many living things, this tree was struck by tragedy. Approximately a year and a half ago, lightning hit the plant causing major bark fissures, thinning of the canopy and loss of vigor. Despite this, the tree survived the stresses of an unusually cold winter in the 1977-78 season. This is perhaps the largest specimen existing in North America and larger than any mentioned in the literature reviewed by these authors.

The Morris Arboretum also has two lesser specimens. One (52-66-A) is 40 feet tall with a spread of 34 feet. It produced an abundant crop of seeds in 1978. The other (57-226) came to the Morris as a B & B specimen from the Taylor Arboretum in 1957. Today this plant is 45 feet tall, spreads 30 feet and rises as a single stem with a D.B.H. of 11 inches to the height of 8 or 10 feet before branching.

Documentation of cold hardiness has been limited, but Allen Cook,
The bark of hovenia is light gray with occasional exfoliated layers revealing colors of warm, reddish-brown. Photo: E. Gray.

horticulturist at the Dawes Arboretum in Newark, Ohio offers the following observations: Seeds were received from Highland Park in Rochester, New York in 1967. They were stratified at 40°F for forty days and two known plants resulted. After attaining some size in a nursery area, the plants were put into permanent locations in June of 1975. The sites selected were protected from winds, with a north
or northwest exposure and good drainage. The winter of 1975–76 was severe with temperatures to \(-10^\circ F\); both of the newly transplanted plants froze to the ground. However, in spring 1976, both sprouted from the root system and by the end of the growing season one was 3 feet tall and the other 5 feet tall. Nature provided a tougher test the following winter with low temperatures of \(-23^\circ F\), and both trees died.

While one could never describe hovenia as outstanding from an ornamental perspective, it does have several notable features. The broadly ovate leaves are a glossy dark green and remain remarkably free of insects and disease. At the Arnold Arboretum during the summer of 1978 the largest plant produced many flowered, terminal cymes of pale creamy-white flowers in mid- to late July, followed by fruit clusters that ripened in October. Gray bark with narrow but deep fissures in the vertical plane gives a series of rectangular plates which occasionally exfoliate and reveal delightful contrasting colors of reddish-brown. Viewed from some distance, the smaller branches are not straight as an arrow, but undulate in long waves giving the branch structure a visually fuller appearance.

From the observations of these authors, the tree appears to grow best in full sun and it seems to be pH adaptable and thrive in a wide range of soil types.

Propagation experiments were performed in 1963 at the Arnold Arboretum to determine the best method of germinating the seeds. Five lots of two hundred seeds were treated. Lot 1 was sown with no pretreatment. Seeds of lot 2 were cold stratified for three months at \(40^\circ F\) before sowing. Lot 3 was stratified at fluctuating greenhouse temperatures of from \(45^\circ F\)–\(80^\circ F\) for three months, followed by three months of cold stratification. Seeds of lot 4 were scarified in concentrated sulfuric acid for one hour prior to sowing; lot 5 received the one hour of acid treatment plus three months of cold stratification.

The two lots of acid treated seeds gave the best results with germination percentages of slightly better than 40 percent while the highest percentage from lots 1–3 was the 3 percent achieved by lot 1. These results indicate that germination is inhibited by a hard, impermeable seed coat, and imbibition of water and germination cannot occur until the seed coat becomes permeable. This would occur in the soil over a long period of time while the seed coats were slowly degraded by natural forces. Scarification by acid treatment or by mechanical means such as filing or sandpapering hastens seed coat degradation and permeability, thereby allowing germination.

Later experiments at the Arnold Arboretum with acid scarification of hovenia seeds have been performed with acid treatment of 1 1/2, 2 and 2 1/2 hours. General germination occurred at both the 2 and 2 1/2 hour treatments with the 2 1/2 hour treatment appearing slightly better.
Hovenia dulcis growing in Yunyang Hsien, Eastern Szechuan, China, at an altitude of 3,000 feet. The tree is 70 feet tall with a circumference of 6 feet. Photographed by E. H. Wilson on July 3, 1910.
In researching this article, the authors found several references stating that cuttings of ripe wood could be rooted, but no literature to substantiate this could be found. The Arnold Arboretum records show that cuttings were taken in March 14, 1929 and that at least one of the cuttings rooted, for it was planted out on the grounds in 1933. Experiments to determine the best method of asexual propagation are now underway at the Dana Greenhouses.

In order to promote further testing of this plant, we have gathered a large quantity of seeds from our older plant. These seeds will be available to members only on a first-come-first-served basis until May, 1979. In requesting seeds, please enclose a self-addressed, stamped envelope and address the request to:

Hovenia Seeds
The Arnold Arboretum
The Arborway
Jamaica Plain, MA 02130

Because the available literature on this plant is sparse, it would be interesting to hear from others who have grown or observed the raisin tree. Additional firsthand comments will help us document the use, cold hardiness and ultimate size of *Hovenia dulcis*.

**Bibliography**

*Botanical Magazine*. 1823. 50: 2360. *Hovenia dulcis*. Sweet Hovenia

*Botanical Register*. 1820. 6: 501. *Hovenia acerba*


Repetition seems to be the rule with groundcovers for the same taxa are used repeatedly and few attempts have been made to educate the public or offer it alternative selections. *Euonymus fortunei* 'Colorata', *Hedera helix*, *Pachysandra terminalis* and *Vinca minor* are the dominant offerings and comprise probably 50 to 60 percent of the total groundcover used in the East and Midwest. None of these groundcovers is without problems and in recent years *Pachysandra terminalis*, Japanese pachysandra, has been afflicted with *Volutella pachysandrae*, a fungal pathogen, that causes cankers and stem dieback. A severe infestation can literally devastate an established planting. Controls are available, but often by the time the homeowner recognizes that a problem exists, it is too late for effective treatment. The monoculture of trees (Ex: American elm) should have taught us something; however, the same type of mistake is being repeated with groundcovers.
Above: Pachysandra terminalis. Although leaf arrangement is alternate, the nodes are so closely spaced that a rosette-like condition results.

Below: Pachysandra terminalis. The specific epithet, terminalis, is derived from the position of the inflorescence. Photos: M. Dirr.
An American species, Pachysandra procumbens, Allegheny pachysandra, is one of the most handsome plants for groundcover use, yet is seldom seen in gardens or in commerce. This fact has been lamented by other authorities (4, 6, 7, 8) and the species suffers a fate common to other quality plants: entrapment in the confines of an arboretum or botanic garden. Several reasons for the lack of visibility include limited publicity compared to its Japanese cousin, and the purported difficulty of propagation. Division (4, 8) offers a suitable means but is excessively slow for commercial purposes.

The plant was discovered by Andre Michaux in the 1790's and was described in his Flora Boreali-Americana (3). Its range was listed as the western Allegheny mountains; hence the derivation of the common name. Braun (2) noted that the species is found in Kentucky, Tennessee, northern Alabama, Mississippi and northern Florida. The species also occurs in North and South Carolina. Wherry (8) studied native stands from Somerset, Kentucky, south to the Gulf of Mexico. He noted that the plant abounded on rocky slopes, being most at home in woods, but persisted even where trees had been cut and land pastured. The underlying rock was limestone and the soil reaction was circumneutral (around pH 7). According to Wherry, most plants were situated on slopes along streams.

The species is hardy far north of its range and is successfully cultured at the Morton Arboretum, Lisle, Illinois as well as at Champaign-Urbana, Illinois, where temperatures may reach -20° to -25°F. A planting has been maintained since 1962 at the University of Minnesota Landscape Arboretum where winter lows reach -30°F; however, snow cover is usually constant and affords protection.

The Arnold Arboretum has plantings that have not been disturbed since June, 1943. One measures 3 by 4.5 feet and another, 3 by 7 feet. The former is on the east side of the Administration Building while the latter is on the north side and hemmed in by the parking lot and building so it can spread in only two directions. There is no evidence of any disease or insect problems in the plantings. The species' extreme shade tolerance is evidenced by the excellent performance in these locations. Under landscape conditions, a moist, well-drained, organic, slightly acid soil would probably prove optimum. Any plant that increases by rhizomes or underground root-stocks benefits from a loose, friable soil because there is less physical impediment to the expanding structures.

Summer foliage ranges from a grayish- to bluish-green with a slight mottle and does not possess the luster of Japanese pachysandra. The leaves assume a bronze color in the late fall and by winter's termination range from greenish-brown to brown. The foliage is not truly evergreen and may vary from deciduous to semi-evergreen.

The broad, outer, dull bluish-green leaves of Pachysandra procumbens often develop a mottled appearance. Photo: M. Dirr.
Leaf retention depends on siting and geographic location. The species forms a handsome carpet that varies from 6 to 10 inches in height. If the foliage deteriorates over winter, abundant new shoots will have developed to form a solid cover by May or June. The leaves are much wider than the Japanese species and display more prominent (coarser) serrations. Although alternate in arrangement, the leaves appear whorled because the nodes are so closely spaced. They range in size from 2 to 3 1/2 inches long and almost as wide.

The flowers are especially attractive and develop in March and April on 2- to 4-inch-long spikes that emanate from the base of the stem. A single stem may have up to three spikes, but one is more common. The position of the flower provides another means of separating the two species, for on Japanese pachysandra the inflorescence is at the top of the stem in the middle of the pseudo-whorl of leaves. The flowers of *P. procumbens* are a purplish- or pinkish-white (stamens may be pink in color) and possess a pleasing fragrance. Wherry termed the odor rancid and musky, but based on personal observation this is not the case. The flowers are unisexual and apetalous with male and female on the same inflorescence. A few female flowers are confined to the base of the inflorescence while the conspicuous and abundant stamens occur at the top. Both species have naked (not hidden by bud scales) inflorescences, which are formed the summer and fall prior to flowering. Unfortunately, if the Allegheny pachysandra is killed to the ground, the flowers will be lost. Even though they are basal, they elongate and partially rise above the foliage which is often flattened by winter weather. The early flowering date couples the species with *Acer rubrum* and together they could be considered “harbingers of spring.”

Fruits are not showy and apparently seldom develop in cultivation. Examination of herbarium specimens of material collected from the wild showed that the fruit is a three-valved capsule that contains small lustrous, dark brown seeds. The fruit is not ornamental on either species, but perhaps controlled crosses might be made between the two thus resulting in interesting hybrid progeny.

The Cornell Plantation (1) reported that Allegheny pachysandra was unfamiliar to many visitors and stimulated more questions than any other plant in their groundcover collections. They further noted that the species was not evergreen in Ithaca, New York, but perfectly hardy, and that twelve-year-old plantings showed no disease or dieback problems.

Propagation difficulties may have limited commercial offerings in the past, but this is no longer a problem. Cuttings of vigorous semi-hardened growth taken in June have rooted readily (1). In experiments at the Arnold Arboretum, cuttings collected in September rooted no less than 80 percent in eight weeks when placed in sand and perlite under mist. Ten treatments were employed and even the controls rooted, but indolebutyric acid (IBA) and naphthaleneacetic
Pachysandra procumbens. The basal inflorescences are formed the summer prior to flowering and range in number from one to three per stem. Photo: M. Dirr.

acid (NAA) when applied as dips (pure chemical dissolved in 50 percent ethanol) resulted in 100 percent rooting and large root systems.

Allegheny pachysandra is an aesthetically functional alternative to the more common groundcovers. Ask your local nurseryman or garden center operator for help in locating plants. The following firms may serve as an alternative if there are no local sources:

The Wild Garden
Box 487
Bothell, Washington 98011

Brookside Nursery, Inc.
Darien, Connecticut

Weston Nurseries
Hopkinton, MA
Literature Cited

Mature leaf of Pachysandra terminalis showing wedge-shaped leaf base and prominent terminal serrations. Photo: M. Dirr.
The Gift of Time

by Margo W. Reynolds

Selflessness is a quality rarely encountered anymore in today's "me first" society. Fortunately for the Arnold Arboretum, however, and for similar institutions, there still are people who think that helping others is a reward in itself, one that brings gratification to both the giver and the receiver. The generous men and women who comprise the volunteer program at the Arnold Arboretum are just such people and it gives me great pleasure in this issue to salute and applaud them.

The Arnold Arboretum's volunteer program was launched in 1971 in anticipation of our Centennial celebration. Volunteers were particularly active at this time in preparation for the event, and continued to be invaluable during the Centennial as tour guides, organizers, and in numerous other capacities. Currently, there are about thirty volunteers, twenty-two of whom are regular in their participation; others come in for special projects, or as they are needed. The ranks will be increased in February when another training program is scheduled to begin.

Now that these good people have been part of our lives for nearly eight years, it is hard to imagine the Arboretum without them; it simply would not be the same. We are a small staff and we are, every one of us, stretched to our limits much of the time. Somehow, with everyone putting in a little extra, we manage to accomplish the possible; the essential tasks that must be done to keep an arboretum running. It is often only with the help of our volunteers, however, that we are able to do the impossible; those extras that we could not do ourselves, the extras that make a difference.

But for our volunteers, the exhibition gallery would stand empty much of the year, for none among the staff have the months required to research, document, locate photographs for, and assemble such comprehensive exhibits as "Spreading Roots," "Flora From Shakespeare" and others.

The public would never have the opportunity to visit the greenhouses to learn about the workings of a propagation facility because there would be no one with the time to give tours, patiently explaining the set-up, the equipment, the plants and the various horticultural practices in use.
Our gates would be closed, of necessity, to any and all groups desiring guided tours of our 265 acres in Jamaica Plain and at the Case Estates in Weston. It would be unthinkable, of course, to stop encouraging people to visit this spot of inordinate beauty from which there is so much to learn, but the staff cannot possibly handle all the school groups, garden clubs and others who request individual attention.

We certainly would have to discontinue the distribution of plant dividends to Friends. The time involved in wrapping, packing, addressing, stamping, sorting, and mailing thousands of small plants every year is prodigious. We could do what other organizations have done, I suppose, and contract the mailing out — but the cost of a membership would rise considerably.

We would have to severely curtail our distribution of seeds to other arboreta and botanical gardens. Who would do all the collecting (much of it in the extreme humidity of summer or in the biting cold of winter), not to mention the meticulous cleaning, sorting and preparation required before a seed even leaves our hands?

Friends who enjoy the book reviews in Arnoldia, and who consult them when purchasing items for their personal libraries, would have to make do with fewer in each issue. Reading and reviewing books is something most of us have time to do only after the daily paperwork is completed, and that free time is limited.

Magazines, newspapers and libraries requesting slides of the Arboretum or of specific plants would have to write their articles or plan their displays without the added visual impact that a picture provides. Who would do the mounting, cleaning, sorting, labelling, filing and organizing that are necessary to keep a slide collection functioning and useful?

Clerical work would fall behind, nursery inventories might never get done, the cone collection would still be in disarray, collecting would slow down, mapping and labelling would fall behind, periodicals would remain unshelved, the leatherbound books would deteriorate if not cleaned, there no longer would be a continuous floral display in the entrance hall to greet visitors, there would be fewer educational courses and tours, there would be no one to translate foreign texts . . . things would be, oh, so very different.

The above are only the tangibles, however; they represent but a fraction of what the word “volunteer” means at the Arnold Arboretum. Nearly as important are the intangibles; those special little touches that add a personal element to each volunteer/staff relationship. Did you know, for instance, that the retired physician who works so industriously in our conifer collection is also the reserve center on our lunchtime football team? Make no mistake about it — the game’s more fun when Dr. Richard Warren is in it. And you can’t convince the staff that Christmas is on December 25. Our Christmas arrives on the eagerly awaited day that volunteer Catherine Hull
A group of Arnold Arboretum volunteers poses beneath a hardy silk tree at the Case Estates following a luncheon meeting there last September. Back Row (left to right) Albert Thompson, Gertrude Cronk, Barbara O'Connor, Janet Thompson, Richard Dwight, June Hutchinson, Robert Siegel, Nathaniel Whittier, Leslie Oliver, Louis Segel. Front Row (left to right) Cora Warren, Doris Loomis, Marie Dempsey, Loretta Wilson, Sheila Magullion, Elinore Trowbridge, Sylvia Grey.

brings her famous, transitory, homemade marshmallow fudge. An appearance by Lou Segel always means a joke. It never fails to lighten the moment and oftentimes its after-effects linger to brighten the whole day.

We use all of the many talents of our volunteers. The retired English professor who works several mornings every week cleaning seeds and preparing nursery inventory at the greenhouse recently delighted a large audience at one of our Wednesday luncheon lectures with a marvelous reading of Robert Frost's poetry. Yet another volunteer, a retired surgeon, recounted in a fascinating slide presentation his trip to Japan with the Boston Symphony Orchestra. Our youngest volunteer, a fifteen-year-old high school student, recently won a prestigious award from the National Rose Society for his work with those plants. A young blind volunteer is teaching us all that lack of sight is not a limitation when there is the desire and the perseverance to work with plants.

We are immeasurably enriched by our volunteers — our friends. The staff may be the timber of the Arboretum house, but the volunteers are certainly the nails that hold us together, for they give us that most selfless gift of all — the gift of time.
Carpinus betulus. Photo: M. Dirr.
It is a great pleasure to bring to the attention of readers of Arnoldia the publication of Neil Treseder's long awaited book. Published in collaboration with the Royal Horticultural Society, this volume is destined to become a sought-after classic and collector's item for both present and future horticulturists and botanists.

Based on extensive research into both the botanical and horticultural literature, the main body of Treseder's text presents detailed descriptions of all the north temperate zone species of the horticulturally important and botanically intriguing genus Magnolia. Coupled with a chapter entitled 'Revised Survey of the genus Magnolia together with Manglietia and Michelia' contributed by the late James Edgar Dandy (formerly of the British Museum (Natural History) and world authority on the Magnoliaceae), Treseder's book is the closest approach to a monograph of Magnolia that has appeared in print. The descriptions of the species and their cultivars, as well as those of the numerous interspecific hybrids of garden origin (to which a section of forty-six pages is devoted) are supplemented by important discussions of the cultural and historical aspects of each taxon, as well as problems relating to their classification, taxonomy, nomenclature, and distribution and original discovery in nature. These descriptions and discussions are greatly enhanced due to Treseder's firsthand knowledge and observations of magnolias in cultivation.

The fourth generation to head the world famous Treseder Nursery, Ltd., Truro, Cornwall, England, Neil Treseder grew up in what might easily be termed "Magnolia Country." Close at hand are the world famous collections of magnolias in Cornish gardens, particularly those at Caerhays Castle and at Trewthen, the home of the late Col. George Johnstone, whose Asiatic Magnolias in Cultivation (Royal Horticultural Society, 1955) has since its publication been the standard reference for species of Asiatic origin and can be considered the precursor of Treseder's book. These famous Cornish gardens contain many of the original introductions of Wilson and Forrest, among others, and are the gardens in which several of the more spectacular garden hybrids have arisen. Moreover, Treseder has traveled widely to observe magnolias, including at least one trip to North American gardens, and has corresponded with numerous members of the American Magnolia Society, of which he is a member. On the practical side, Neil Treseder brings years of experience as a practicing nurseryman to bear in the section entitled 'How to Grow Magnolias.' This practical guide covers topics including propagation, pests and diseases, planting, and cold hardiness, while another section outlines the techniques used in hybridization.

Throughout, the volume is well illustrated with line drawings by Marjorie Blarney, while thirty-nine color photographs and nine color reproductions of her original paintings are reproduced on eight special, unnumbered pages. The typography and layout are both pleasing to the eye, and the binding is solid yet flexible enough to allow for easy opening and reading.

And this book does invite reading. The text is in an easy, personable, albeit British, style and is sure to delight both old and new magnoliaphiles — those whose interest is primarily horticultural as well as those whose interests lie in the taxonomy of the genus and the controversy surrounding specific boundaries, particularly in the Oyama and Buergeria sections of the genus.
Neil Treseder is to be congratulated on a beautiful book well produced and an information-filled, accurate text. My only concern is that the two maps which follow at the end of the book and purport to illustrate magnolia distribution in Asia and North America, respectively, are misleading inasmuch as the boundary lines of natural distribution have not been superimposed over the maps. Despite this one minor oversight, everyone interested in woody plants will want to own this book.

Stephen A. Spongberg


The Elberts, already known for their previous volumes and magazine articles on various aspects of indoor growing and for their involvement with the light gardening movement, have with this volume undertaken their first detailed study of a single plant family. It is not surprising that they should have chosen the Gesneriaceae for this effort, since the popularity of this group (which includes such important houseplants as the African violet, gloxinia, and streptocarpus) has been growing at almost epidemic speed and the last volume covering the family, published in 1967, has long been out-of-print. With such popularity, the number of species and cultivars introduced since 1967 has rendered the earlier volume quite incomplete, even if it were available. It is surprising, however, that the authors should have chosen this time to compile a study of the Gesneriads, since recent introductions and hybridizing efforts have led to considerable taxonomic revision, and a shifting about between genera which will, in all probability, continue for some time. The Elberts, in their somewhat grudging acknowledgement of these changes in nomenclature, and their caustic comments regarding the importance to the taxonomist of seeing his name in print, give this reviewer the distinct feeling that the answer may be quite simple: Whether Gesneriad nomenclature is, or will remain, current was not a priority; they knew the book would sell.

And sell it will! The Gesneriads have a loyal following that has been waiting for years for an up-to-date reference, and the book is designed to appeal to the collector of assorted houseplants as well. It is into this second category, in fact, that the Elberts themselves fall, although their collection has at one time or another contained an impressive percentage of the Gesneriads that are available in the United States. Their personal observations, to which they give free rein, may differ from those of the Gesneriad hobbyist, but will probably match those of the grower of a mixed collection; unless the Gesneriad in question will out-perform a non-Gesneriad, it is not worth the bother.

Although the major portion of the book (167 of the 224 pages of text) is devoted to an alphabetical survey of the genera, the Elberts have included brief but informative sections that cover the taxonomic characteristics differentiating the Gesneriads, their culture and propagation, a glossary of terms, and lists of suppliers of plants, seed and supplies. It is unfortunate that the addresses of the two national societies devoted to the Gesneriaceae are not included, since it is inevitable that readers of this book will be hungry for more information.

The Elberts' conversational style of writing makes this book a pleasure to read, despite one's occasional anger at the intrusion of their prejudices. As an introduction to the Gesneriaceae, this book will certainly interest many indoor gardeners and inspire them to experiment with some of the less common genera. The photographs alone should start a run on the specialist greenhouses. For the more advanced hobbyist, although the book leaves much to be desired, it will be a much-used reference.

Jennifer Hicks
In the last seven years, at least four important books on identification and cultivation of conifers have appeared in Britain: *Conifers in the British Isles, A Descriptive Handbook* by A. F. Mitchell of the Forestry Service, *Conifers for Your Garden* by Adrian Bloom, *Ornamental Conifers* by Charles R. Harrison, and, now most recently, the present volume by Brian and Valerie Proudly. Mitchell's book contains practical descriptions by a foremost expert and unique information on the identification, location and welfare of major specimens in the British Isles. It is for the taxonomist and connoisseur, not the horticulturist. The Bloom and Harrison volumes both provide lists and colored photographs of the plants most suitable for horticultural purposes, and give valuable information on planting methods, nurturing, diseases, and landscaping principles. Bloom's is selective; Harrison's, comprehensive.

The Proudlys' volume is also primarily for the gardener. It contains colored photographs of selected samples only, and thus preserves comprehensiveness in a limited space. The authors have divided it roughly into thirds. The first section consists of definitions and landscaping and horticultural information. The second comprises 214 color photographs, and the third, brief descriptions of approximately 600 plants. The list was prepared by consulting 'Nurserymen's catalogues from twenty-seven firms in ten different countries where conifers are grown.'

Although the authors offer their many invaluable horticultural hints against the background of British growing conditions, this should not prevent American interpretations and applications. It is a surprisingly comprehensive book for one that fits in the coat pocket. Britain has provided the conifer enthusiast with yet another volume essential to his or her extending bookshelf.

**Richard Warren**

![A specimen of Fagus sylvatica 'Tortuosa' in winter garb at the Arnold Arboretum. Photo: M. Dirr.](image-url)
U.S. POSTAL SERVICE
STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION
(Required by 39 U.S.C. 3685)

1. TITLE OF PUBLICATION

ARNIZDIA

2. DATE OF FILING: Sept. 18, 1976

3. LOCATION OF KNOWN OFFICE OF PUBLICATION (Name, City, State and ZIP Code) (First printed)

The Armbury, Jamaica Plain, Massachusetts 02136

4. LOCATION OF THE HEADQUARTERS OR GENERAL BUSINESS OFFICE OF THE PUBLISHER (First printed)

The Armbury, Jamaica Plain, Massachusetts 02136

5. NAME AND COMPLETE ADDRESS OF PUBLISHER, EDITOR, AND MANAGING EDITOR

The Arnold Arboretum of Harvard University, Armbury, Jamaica Plain, Massachusetts 02136

Jane E. Wolffe, Arnold Arboretum, Armbury, Jamaica Plain, Massachusetts 02136

MANAGING EDITOR (Name and Address)

Jane E. Wolffe, Arnold Arboretum, Armbury, Jamaica Plain, Massachusetts 02136

6. OWNER (If owned by a corporation, its name and address must be stated also; if owned by a trust, the name and address of the person in control must be stated. If not owned by an individual, the individual or corporation, or both must be listed.)

The Arnold Arboretum of Harvard University

Address: Armbury, Jamaica Plain, Massachusetts 02136

7. KNOWN BONDHOLDERS, MORTGAGEES, AND OTHER SECURITY HOLDERSownING OR HOLDING 1 PERCENT OR MORE OF TOTAL AMOUNT OF BONDS, MORTGAGES OR OTHER SECURITIES (If there are none, so state)

The President and Fellows of Harvard University

Address: Cambridge, Massachusetts 02138

8. FOR COMPLETION BY NONPROFIT ORGANIZATIONS AUTHORIZED TO MAIL AT SPECIAL RATES (Section 103 (c) 3, P.L. 84-312)

The address, function, and necessary status of this organization and the exempt status for Federal income tax purposes (Check one)

☐ Does not qualify as a nonprofit organization authorized to mail at special rates

☐ qualifies as a nonprofit organization authorized to mail at special rates under Section 103 (c) 3, P.L. 84-312

9. EXTENT AND NATURE OF CIRCULATION

Average no. copies each issue during preceding 12 months

Actual no. copies of single issue published nearest to filing date

A. TOTAL NO. COPIES PRINTED (Net Free Iss

3500

3500

B. FREE DISTRIBUTION BY MAIL, CARER, OR OTHER MEDIUM (specify)

200

200

C. DISTRIBUTION FROM HOME AND OFFICE USE (Net Free Iss

2776

2776

D. DISTRIBUTIONхи D) и

2776

2776

E. DISTRIBUTION TO NON-SUBSCRIBERS

176

176

F. DISTRIBUTION TO NON-SUBSCRIBERS

547

547

G. TOTAL DISTRIBUTION TO NON-SUBSCRIBERS

None

None

H. TOTAL (Sum of C, D, E and F) should equal net paid and non-paid

3500

3500

11. I certify that the statements made by me above are correct and complete.

Signature and title of Editor, Publisher, Managing or Owner

Jane E. Wolffe, Editor

12. FOR COMPLETION BY PUBLISHERS MAILING AT THE REGULAR RATES (Section 103 (c), Post Office Manual)

In U.S. C. O. 3628 (insert in pertinent part), "No person who would have been entitled to mail matter under former section 3628 of this title by reason of the regulations promulgated during the transition period, shall be entitled to such privilege unless he files annually with the Postmaster of such Post Office, the form prescribed by the Postmaster General under regulations promulgated for such purpose.

Signature and title of Editor, Publisher, Managing or Owner

Jane E. Wolffe, Editor

(See instructions on reverse)