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Cover: Hedera helix. Photo: P. Chvany.
Some Old and New Interspecific Magnolia Hybrids

by Stephen A. Sponberg

In 1820, John Sims described a new variety of the native American sweet-bay, *Magnolia virginiana*, and presented an illustration of the new plant in Curtis's Botanical Magazine under t. 2164 (Figure 1). Sims named the plant var. *major* due to the larger size of its leaves and flowers, and in a brief discussion he suggested that the plant was similar in several respects to *M. tripetala*, the umbrella-tree, another American species. The plant on which Sims based his new variety was growing and flowering in the nursery of Archibald Thompson (sometimes spelled Thomson) at Mile End, near London, and had been grown from seed collected by Thompson in 1808 from a plant of *M. virginiana* growing in his nursery. Thompson also grew *M. tripetala*, and the intermediate appearance of the new plant obviously suggested that it might be a hybrid or "mule" between the two American species.

Despite this circumstantial evidence and the intermediate appearance of the plant, the English horticulturist J. C. Loudon, in 1838, persisted in considering it as a large-flowered variety of *Magnolia virginiana*. However, he referred to the plant as var. *Thompsoniana*, since Thompson had been distributing propagated plants under that name. Finally, in 1876, C. de Vos was convinced that the plant represented a hybrid between *M. virginiana* and *M. tripetala*, and, as a result, he gave it a species name, *M. × Thompsoniana*. Only recently, however, has the hybrid status of *M. × Thompsoniana* been proven more or less conclusively. Dr. J. C. McDaniel, a noted authority on Magnolias at the University of Illinois, has made deliberate cross-pollinations between the two suspected parental species and obtained viable seed. Plants he has grown from this seed in Illinois are almost identical with the plant Sims described as var. *major*, and photographs of McDaniel's plants in flower match the illustration in the Botanical Magazine.

It may seem somewhat ironic that *Magnolia × Thompsoniana*, a hybrid between two American species of *Magnolia* and the first *Magnolia* hybrid to be suspected and described, originated across the Atlantic in the nursery of an English plantsman. An important as-
pect of the origin of *M. × Thompsoniana*, however, is the fact that the two parental species were growing in close proximity to one another in cultivation. Unlike species of numerous genera of flowering plants that are known or strongly suspected to hybridize freely in nature, I know of no reports of Magnolias that are considered to represent hybrids that have arisen in nature. More than likely, the absence of natural hybrids in the genus is due to the fact that within any geographical region where species of *Magnolia* occur in the native flora,
the different species occupy different habitats or have developed other barriers to hybridization, such as different blooming periods or genetic blocks that prevent fertilization or that result in inviable hybrid seed.

However, once the ornamental value of Magnolias was recognized and gardeners and horticulturists began to assemble collections of these desirable trees and shrubs, the natural barriers of habitat and geography were no longer present, and several spontaneous hybrids have originated in gardens, while horticulturists, anxious to combine characters of one species with those of another, have aided the process with paint brush, forceps, and paper bags.

That species often hybridize in gardens and arboreta is a well known fact, and many of the most highly prized woody ornamentals have originated in cultivation by means of interspecific hybridization. One only need to bring to mind *Daphne × Burkwoodii, Hamamelis × intermedia, Platanus × acerifolia, Rhododendron PJM hybrids* as well as a multitude of other *Rhododendron* hybrids, the large and popular group of hybrid-tea roses, and numerous other examples to realize the importance of interspecific hybridization to modern horticulture. Some extreme examples of hybridization are found in the orchid family where a particular hybrid plant may be the result of a series of crosses that eventually involved species of as many as five different genera. But the object of this article is to discuss briefly and call attention to some of the older and newer hybrids in the genus *Magnolia*.

Before discussing these *Magnolia* hybrids, however, a few comments concerning hybrids in general are appropriate since the terminology surrounding hybrids is potentially confusing. While geneticists may use the term hybrid interchangeably, they usually use it to refer to the progeny that result when any two genetically different organisms are mated sexually. Genetic hybrids can be produced between individuals of the same or different taxa. As an example, the plants resulting from the natural process of reproduction through cross-pollination and seed formation would, to the geneticist, constitute hybrids, since the new plants are genetically different from the two parental plants. In contrast, offspring resulting from self-pollination or matings of genetically identical individuals would constitute non-hybrids or "pure lines."

To the taxonomist and horticulturist concerned with woody ornamentals, plant hybrids consist of offspring resulting from the sexual union of plants belonging to different taxa, and this is the sense in which the term is used in this paper. Thus, *Magnolia × Thompsoniana* is an interspecific hybrid because the two parental taxa, *M. virginiana* and *M. tripetala*, belong to different species. Hybrids between two different varieties of the same species, or between a subspecies and a variety of the same species, are referred to as intraspecific hybrids. If
breeding is carried out within a single taxon, such as cross-pollinations between red- and white-flowered plants of the same species or variety to produce a desired pink-flowered plant, the resulting plants are usually referred to as “crosses.”

The names that apply to hybrids can also be rather confusing, inasmuch as some have received species names, while others are known by a formula name, and many others of horticultural importance are known chiefly by cultivar names. In general practice, taxonomists refer to interspecific hybrids by a formula that consists of the names of the two parental species linked by the sign of multiplication. The sign of multiplication is used to indicate the hybrid nature of the group, and if it can be determined, the name of the seed parent is given first. Therefore, the *Magnolia* that originated in Thompson’s Mile End nursery could be assigned to *M. virginiana × M. tripetala* (or more usually as *M. virginiana × tripetala*). But, provision is made in the Code of Botanical Nomenclature for giving a hybrid a less cumbersome species, subspecies, or varietal name if, for ease of communication, one is merited. In that case, as in *M. × Thompsoniana*, the generic name and the species epithet (the “Thompsoniana” part of the species name) are linked by the sign of multiplication, again to indicate the hybrid nature of the plants. A species name has the advantage of being more easily remembered, yet the formula name has the advantage of indicating the parental species of the hybrid group. If the hybrids are the result of intraspecific cross-pollinations, the group can be recognized as a variety or subspecies, but the rank given the group can be no higher than the highest ranking parental taxon, and the connecting × is not used. Obviously, hybrids between different varieties of the same species can also be indicated by a formula name.

Another provision of the Code of Botanical Nomenclature states that once a botanical name has been given to a hybrid group, that name is a collective epithet and all hybrids, past, present, and future, between the two parental taxa, fall under that name. This provision holds, despite the fact that hybrids between particular plants of two species, subspecies, varieties, etc., may appear quite different than hybrids between other plants of the same two taxa.

In most instances, not all the plants that result from hybridization between two taxa are of horticultural merit, and often only one or two hybrid plants are outstanding additions to the ornamental flora. These plants are often given cultivar or fancy names to distinguish them from their siblings, and if these cultivars are used as stock to propagate clonal offspring, their genetically identical plants carry the same cultivar name. Cultivars may be selected from hybrid groups that otherwise are known by a formula name or by a species, subspecies, or varietal name. But in either case, the formula or other botanical
name is often omitted when reference is made to a particular cultivar. Thus, one often encounters *Magnolia* 'Charles Coates' in nursery catalogs and plant lists without reference to its botanical or formula name. It should be noted that not all cultivars are selected from hybrid groups.

Returning to *Magnolia*, one of the intriguing biological aspects that has been noted concerning interspecific hybrids is the fact that none is known between species of the two subgenera into which taxonomists customarily divide the genus. This phenomenon appears to be maintained despite the fact that in cultivation species of the two subgenera are often grown in the same collection. Apparently, in addition to the geographical and habitat differences that prevent hybrids in nature, strong genetic barriers to compatibility exist between certain species. The fact that hybrids are not known between species of the two subgenera has strengthened the validity and naturalness of the division of the genus. These two groups are briefly characterized as follows:

*Magnolia* subgenus **MAGNOLIA**: Evergreen or deciduous trees or shrubs, the flowers appearing with the leaves; tepals subsimilar, the outer whorl like the inner whorls, never reduced in size and sepal-like; anther sacs introrsely dehiscent.

*Magnolia* subgenus **YULANIA**: Deciduous trees and shrubs, the flowers appearing before the leaves or with the leaves; the outer whorl of tepals sometimes reduced in size and sepal-like; anther sacs laterally or sublaterally dehiscent.

While both of these subgenera are further divided into a number of sections (each comprised of one to several species), within subgenera there appear to be weaker barriers to interspecific hybridization between species of different sections, while within sections hybrids are relatively common or easily obtained by intentional cross-pollinations. Figure 2 presents, in a diagrammatic fashion, the interspecific hybrids that are known or suspected in subgenus *MAGNOLIA* and subgenus *YULANIA*, respectively. The lines connecting the species names that appear on the periphery of the circles indicate that interspecific hybrids are known or strongly suspected between the species so linked. Many of these hybrids have been produced in recent years as the results of intentional cross-pollinations by *Magnolia* enthusiasts, and most are currently of very limited distribution in cultivation and are not available commercially. As a result, the

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1 The species and interspecific hybrids indicated in these diagrams are those accepted in my treatment of the cultivated Magnoliaceae that is scheduled to appear in the July, 1976, number of the *Journal of the Arnold Arboretum*. In that treatment the status of several previously recognized hybrid groups that are not included here are rejected and the reasons discussed.
SUBGENUS MAGNOLIA

SUBGENUS YULANIA
notes that follow concern some of the interspecific hybrids that are available from nurseries specializing in Magnolias, and these notes are followed by a short list of nurseries I know of that offer these plants for sale. Following the discussion of each hybrid, those nurseries offering plants of that hybrid for sale are listed by abbreviations explained in the nursery list.

Interspecific Hybrids of Subgenus Magnolia

**Magnolia × Thompsoniana** (Loudon) C. de Vos, Nederl. Fl. & Pomon. 131. t. 43. 1876.

While most aspects of this hybrid between *Magnolia virginiana* of sect. Magnolia and *M. tripetala* of sect. Rytidospermum have already been discussed, it deserves mention here that in all probability old plants of this hybrid have been derived from Thompson's original plant by clonal propagation. To my knowledge, Dr. McDaniel's plants have become available commercially only recently and are not widespread in cultivation. While *M. × Thompsoniana* has been considered as precariously hardy in the Philadelphia area, the new plants of this hybrid produced by Dr. McDaniel may prove harder, since he took great care to use plants of *M. virginiana* and *M. tripetala* from northern populations as seed and pollen parents, respectively.

Usually forming large deciduous shrubs or small trees, often of ungainly habit if not pruned, plants of *Magnolia × Thompsoniana* are noted for their large leaves that are markedly glaucous on the undersurfaces and for their creamy white, fragrant flowers that are showier than those of either of its parents. Most easily confused with plants of *M. virginiana*, plants of the hybrid can be distinguished at any time of year by the incompletely septate pith of its young branchlets. The pith of *M. virginiana* is completely septate while young branchlets of *M. tripetala* have a continuous pith. (GF; H; T.)


This is another hybrid group, like *Magnolia × Thompsoniana*, that involves *M. virginiana* as the seed parent and an additional American species, *M. grandiflora* of sect. Theorhodon, as the pollen parent. Despite the great horticultural potential of this group, it has never been given a botanical name, although it is often referred to informally as the Freeman hybrids, after O. M. Freeman of the United States National Arboretum, who first produced plants of this parentage. Freeman made cross-pollinations between *M. virginiana* and *M. grandiflora*, the bull-bay that is native to the Coastal Plain of the southeastern United States from North Carolina to central Florida.

Figure 2. Documented or strongly suspected interspecific hybrids of Magnolia species of subgenus Magnolia and subgenus Yulania.
and west to eastern Texas, in 1930 and 1931. Despite the documented influence of *M. virginiana*, plants of this evergreen hybrid resemble *M. grandiflora* most closely. The overall resemblance of the hybrid plants to *M. grandiflora* is so great that difficulty might be encountered in distinguishing the hybrid plants without resorting to technical botanical characters. The fact that the petioles of *M. grandiflora* lack stipule scars is diagnostic for that species. Petioles of *M. virginiana*, however, have large stipule scars that are prominent along the upper sides of the petioles. The hybrid plants, like *M. virginiana*, also have the stipules attached to the petioles in bud, and as the leaves expand the stipules fall off, leaving scars on the petioles. However, the scars are very small and often obscured by the pubescence of the petioles. Careful observation of the petiole base, however, will indicate the presence of a stipule scar and will distinguish the hybrids from *M. grandiflora*.

Two cultivars, 'Freeman' and 'Maryland', have been selected from the hybrids grown at the National Arboretum and represent the group in cultivation elsewhere. 'Freeman' is a plant of upright, columnar habit, while 'Maryland' is of spreading habit, and both clones are reported to propagate fairly easily from cuttings. At the Arnold Arboretum we have several small plants of *Magnolia virginiana* × *M. grandiflora* in the nursery. While the plants have suffered during some of our recent winters, most of them withstood the rigors of this past winter with little or no die-back. Further testing for hardness within this hybrid group might eventually provide New England with a *Magnolia* that has the overall appearance and the attributes of *M. grandiflora*. (H; T.)

*Magnolia* × *Wieseneri* Carrière, Rev. Hort. 62: 406. 1890.

Plants of this hybrid (Figure 3) are currently referred to in nursery catalogs and in the horticultural literature as *Magnolia* × *Watsonii* J. D. Hooker. However, Carrière's name for these hybrids was published a few months before Hooker's name and description appeared in Curtis's Botanical Magazine (117: t. 7157), and under the rule of priority in the Code of Botanical Nomenclature, Carrière's name has precedence and is the correct name for this group. First introduced into western horticulture by the Japanese in 1889 at the International Exposition held that year in Paris, *M. × Wieseneri* is considered to constitute a hybrid of garden origin between two native Japanese Magnolias, *M. Sieboldii* of sect. Oyama, and *M. hypoleuca* of sect. Rytidospermum. The plants exhibited by the Japanese were purchased by the Royal Botanic Gardens, Kew, and some plants of *M. × Wieseneri* in cultivation are undoubtedly derived from this original importation. Other plants may have been imported directly into this country from Japan.
Magnolia hypoleuca, the Japanese white-leaf Magnolia, is a large tree that is closely related to the American M. tripetala, and like M. tripetala, has its very large leaves clustered in false whorls near the ends of branchlets. This leaf arrangement gives the appearance of an open umbrella, the prominent midveins of the leaves appearing as the supporting ribs, and the blades of the leaves as the fabric. The other presumed parental species, M. Sieboldii, is a large shrub or small tree with distinctly alternate, only moderately-sized leaves, and its beautiful white flowers are held nodding or pendent on the branchlets. Moreover, the stamens are a beautiful crimson red and contrast markedly with the white tepals. By contrast, the waxy white flowers of M. hypoleuca are held more-or-less upright on the branchlets, and the stamens are red only at the base. Plants of M. x Wieseneri known to me are deciduous shrubs that are intermediate in most respects between the two parental species, but they have inherited the crimson stamens of M. Sieboldii while the upright pose of the flowers is indicative of the influence of M. hypoleuca. The leaves are sometimes
crowded at the ends of branchlets, and the plants usually develop into small, bushy trees. Unfortunately, this beautiful hybrid, which commences to bloom in June, is not known to me to be cultivated outside the collections of one or two botanical gardens and arboreta. It is deserving of much wider planting, particularly since it blooms after the majority of spring-flowering shrubs and because it would be appropriate for small garden areas. (H; T.)


*Magnolia* 'Charles Coates' (Figure 4) is a putative hybrid between the Asiatic *M. sieboldii* and the American *M. tripetala*. Its cultivar name honors Mr. C. F. Coates, former foreman-propagator in the Arboretum at the Royal Botanic Garden, Kew. In 1946 or 1947 Mr. Coates discovered three small, self-sown seedlings in the *Magnolia* collection at Kew and suspected that they might prove to be hybrids. He removed the seedlings to the nursery, and when they first flowered in 1958, the hybrid nature of the plants was confirmed.

Like *Magnolia × Wieseneri*, *M. 'Charles Coates'* has inherited from *M. sieboldii* the beautiful crimson stamens that contrast with the creamy-white tepals of the flowers, while in vegetative aspects the plants most closely resemble the sect. *Rytidospermum* parent, *M. tripetala*. The large leaves are somewhat smaller than those of *M. tripetala*, but, like the leaves of that parent, they are often clustered in false whorls at the ends of branchlets. The most attractive feature of *M. 'Charles Coates'* are the large, upward-facing flowers; the creamy-white tepals, unlike those of other Magnolias, are wavy margined. The plants I have seen form small trees or large shrubs that bloom in May and June, and judging from the hardiness of the two presumed parents, *M. 'Charles Coates'* should prove hardy at least as far north as the Boston region. (H; T.)

**Interspecific Hybrids of Subgenus Yulania**


The saucer Magnolias, *Magnolia × Soulangiana* (Figure 5), are to many people synonymous with *Magnolia*, and because of their widespread use in ornamental plantings probably need no description here. This hybrid group, which was first raised by Chevalier Soulange-Bodin at Fromant, near Paris, between 1820 and 1840, is undoubtedly the most widely cultivated and popular of all Magnolias in temperate regions. Moreover, it serves as a good example of the variability characteristic of some hybrid groups. The plants classified under *M. × Soulangiana* include a complex array of hybrid plants.
between two Asiatic species, *M. heptapeta* (syn. *M. denudata*) of sect. Yulania, and *M. quinquepeta* (syn. *M. liliflora*) of sect. Tuli-pastrum, which are also widely cultivated, both in China and Japan as well as in western gardens. Soulange-Bodin’s original plants of *M. × Soulangiana* were produced as a result of intentional pollination of *M. heptapeta* flowers with *M. quinquepeta* pollen.

Undoubtedly, part of the reason that plants of *Magnolia × Soulangiana* are variable is because the parental species themselves exhibit variation. But the situation within this hybrid group is complicated...
by still another factor. The *Magnolia* hybrids that have been discussed under subgenus *Magnolia* represent first generation plants that have been maintained by asexual propagation. As a result, the plants in cultivation exhibit only minor differences that are associated with local environmental or climatic factors. The situation in *M. × Soulangiana*, however, is more complex. Despite the fact that most plants of the group are partially sterile, seed is occasionally produced and it appears that a hybrid "swarm" has developed in cultivation that includes not only first generation plants but plants of succeeding generations as well. Plants of the succeeding generations display variation due to genetic segregation, a phenomenon first explained by Gregor Mendel based on experiments he conducted with the common garden pea. Still other variants of *M. × Soulangiana* have undoubtedly resulted from crosses between hybrid plants and both parental species; this type of cross is known as a backcross. The consequence is a continuum of variation between *M. heptapeta* and *M. × Soulangiana* on the one hand and *M. × Soulangiana* and *M. quinquepeta* on the other.

Because many of these crosses between hybrid plants as well as the backcrosses to the parental taxa are undocumented, precise knowledge of the origin or genetic background of most plants of *Magnolia × Soulangiana* is lacking. However, numerous individual plants of horticultural value have been selected from the array of variability, and they have been given cultivar names. One hundred and three cultivars of *Magnolia × Soulangiana* are listed by Fogg and McDaniel (1975) in their checklist of *Magnolia* cultivars, and since those available commercially from reputable nurseries are propagated asexually, the gardener is assured of obtaining the particular variant he wants to grow.


More widely grown in England, the country of its origin, than in the United States, *Magnolia × Veitchii* (Figure 6) combines *M. heptapeta* and *M. Campbellii*, both of sect. Yulania. Peter Veitch of the Royal Nurseries, Exeter, attempted a series of cross-pollinations between *M. Campbellii* and *M. heptapeta* in 1907, yet only one cross resulted in a fruit cone with viable seed. The successful cross had employed *M. Campbellii* as the pollen parent and *M. heptapeta* as the seed parent.

The resulting hybrid plants proved variable in flower color. Of five plants raised from the seed obtained, four eventually produced white flowers, while the fifth plant produced pink flowers, and two cultivars have been designated, 'Peter Veitch' with pink, and 'Isca' with white flowers. Plants of *Magnolia × Veitchii* are extremely vigorous trees that have attained over 80 feet in height in Cornwall in
southwestern England; in this country the plants are hardy at least as far north as the Philadelphia region (Zone VI), but the plants I know of have not yet attained great heights.

Aside from the abundantly produced large flowers that have the inner whorl of tepals held somewhat erect, partially enclosing the stamens and carpels in the center of the flowers, the plants are noted for their large, glossy green leaves. Both of these characteristics are indicative of the genetic influence of *Magnolia Campbellii*. For eastern areas of the United States, where the spectacular Himalayan *M. Campbellii* unfortunately has not proved, except in rare instances,
Figure 6. The beautiful large flowers of Magnolia × Veitchii, a hybrid between M. Campbellii and M. heptapeta.

to adapt to the climatic conditions, M. × Veitchii is an alternative plant that deserves wider use in ornamental plantings. (GF; H; T.)


Often referred to as the Kosar hybrids, plants of the above parentage are represented in cultivation by a series of eight cultivars ('Betty', 'Susan', 'Pinkie', 'Jane', 'Ann', 'Judy', 'Randy', and 'Ricki') that were selected from the F, generation. The results of intentional cross-pollinations made by William Kosar and Francis de Vos, the hybrid plants were produced at the National Arboretum in 1955 and 1956 using the early-flowering star Magnolia, _Magnolia kobus_ var. _stellata_, and two of its cultivars as pollen parents and the later-flowering _M. quinquepeta_ 'Nigra' and 'Refl orescens' as the seed parents. One of the objectives of this hybridization program was to produce plants that
bloom later in spring than the star Magnolia in order that the flowers might escape damage by hard spring frosts.

Like other members of sect. Buergeria, of which it is a member, *Magnolia kobus* var. *stellata* is a diploid with 38 chromosomes, while *M. quinquepeta*, the Asiatic species of sect. Tulipastrum, is a tetraploid with \(2n=76\). As a result of crossing diploid with tetraploid plants, the hybrid progeny are triploids with 57 chromosomes in somatic cells, and because of this unbalanced chromosome number, the hybrid plants are sterile.

Generally intermediate between the two parental taxa, plants of *Magnolia quinquepeta* × *M. kobus* var. *stellata* are erect, multiple-stemmed shrubs of rounded or conical form that grow to six to ten feet. Like both parents, the hybrid plants are deciduous, but the leaves are most similar to those of the seed parent, *M. quinquepeta*. At the Arnold Arboretum the eight cultivars have bloomed while still young, opening their flowers after the star Magnolia, depending upon the season, about the first or second week of May. The greatest variability encountered in the hybrids, and the major reason eight selections were made, is in flower color and in the number of tepals comprising the perianth. Tepal color ranges from dark reddish-purple through varying shades of light purple or magenta to pinkish, while in number, the tepals vary from six to nineteen per flower. These excellent shrubs, which are as hardy as both parents, should be welcome additions and useful spring-flowering plants in small gardens where space is limited. (GF; H.)


*Magnolia × brooklynensis* is the name that has recently been given to hybrids between *Magnolia acuminata*, the native American cucumber-tree, and *M. quinquepeta* (syn. *M. liliflora*), a species widely cultivated in China and Japan and judged to be native to the former country. These two species are the only species that comprise sect. Tulipastrum, and the hybrids between the American and Asiatic members of the section were originally produced by Mrs. Evamaria Sparber at the Brooklyn Botanic Garden. Both parental species are tetraploids with 78 somatic chromosomes, and the hybrids, produced by pollination of *M. acuminata* flowers with *M. quinquepeta* pollen, are fertile and produce viable seed.

Two cultivars of *Magnolia × brooklynensis* have been named. The first, 'Evamaria', honors Mrs. Sparber, but it has not yet become available commercially. The second cultivar, 'Woodsman', was named by Dr. J. C. McDaniel and was selected from plants of *M. × brooklynensis* that he produced through cross pollinations in Illinois. This cultivar has recently become available commercially.
Although I have not seen plants of 'Woodsman', Dr. McDaniel (1975) reports that it has inherited the tree habit of Magnolia acuminata, as well as the hardiness of that species. The seed parent, M. acuminata, is widely distributed in eastern North America and is the only Magnolia native to Canada. Although the flowers of 'Woodsman' are similar in shape to flowers of M. × Soulangiana, their coloration is unique for a Magnolia. The tepals grade from dark purple through pink and yellow to green. Another asset of this hybrid is the fact that the unusual flowers appear late in spring and thereby avoid being damaged by frosts. Inasmuch as the hybrids are fertile, future generations of gardeners and horticulturists may enjoy variation that will assuredly become apparent as succeeding generations of M. × brooklynensis (as well as yet unknown backcrosses to the parental species) are raised, selected, and grown more widely. (GF.)

A cursory glance at Figure 2 will indicate that the interspecific Magnolia hybrids that have been discussed above are but a few of those that have been obtained. Moreover, it is obvious that not all of the possible hybrids that might be synthesized have been achieved. Undoubtedly, some crosses have been attempted and have failed, but others remain to be tried, and there is always the possibility of new hybrids arising in cultivation without the interference of the hybridizer, and many may prove to be of horticultural significance.

While this article has been limited to those hybrids between two species available commercially, another group of Magnolia hybrids already exists that consists of some spectacular ornamentals. These plants are tri-hybrids, involving some of the di-hybrids discussed above as one parent and other species (other than species involved as a parent of the di-hybrid) as the second parent. Thus, these hybrids are combinations of three species. These tri-hybrids are largely unknown in the United States, and most are of limited distribution in the nurseries or gardens where they originated. We all can look forward to these tri- and new di-hybrids becoming better known in American gardens and arboreta.

Nurseries Selling Magnolia Hybrids

Unfortunately, two of the nurseries listed below are in England, and importation of plants will be necessary. Nurseries other than those listed below may offer plants of these hybrids for sale, and omission of their names from this list is unintentional. No sources are listed for Magnolia × Soulangiana since it is almost universally available in all sections of the country.
The nurseries are:

Gossler Farms Nursery, 1200 Weaver Road, Springfield, Oregon, 97477. Abbreviated GF; catalog available for small charge.


Treseder's Nurseries (Truro) Ltd., Truro, Cornwall, England. Abbreviated T; special Magnolia catalog available.

References


Selected Maples for Shade and Ornamental Planting

by Richard E. Weaver, Jr.

Few hardy genera of plants are as diverse and desirable horticulturally or as valuable economically as Acer, the Maples. Several species are among the most important forest trees in eastern North America, and they are largely responsible for the spectacular blaze of color that covers the landscape of that region during the fall of the year. One of these, the Hard, Rock, or Sugar Maple, is particularly dear to the hearts of New Englanders, as its sap is the primary source of maple sugar — a regional specialty.

The most familiar Maples are perhaps those few large species that are grown as shade trees — primarily utilitarian plants with little thought given to their ornamental value except for the color of their autumn foliage. Others, particularly the Japanese Maples, are universally admired as accent plants for their graceful form and delicate foliage. But some extremely decorative aspects of Maples — namely their flowers and their bark patterns — are largely ignored by the American horticultural public. And many of the intermediate-size species, including some of the handsomest of the genus, are almost entirely unknown to most people.

In this article, the various decorative and utilitarian aspects of Maples hardy in Zone 5 are discussed. Under each of these characteristics, some good and not-so-good species are described. Finally, there is a list of the nursery sources for most of the species and cultivars mentioned. Culture, pests, diseases and propagation in general will not be discussed because of the existence of excellent articles on the subjects (see references below).

Hopefully, my basic enthusiasm for these plants will persuade some of my readers to grow a few of the more unusual types. Hopefully also, my warnings will save other readers a lot of aggravation.

REFERENCES
FOLIAGE

A typical leaf of a Sugar or Norway Maple is an object familiar to most people, whether they are interested in plants or not, and the leaves of most other species are basically similar to these. They are always opposite and, in the great majority of species, simple, with palmate veins and lobes; the margins are variously toothed. There are exceptions to the general rule, however, and some of the species displaying them might not be immediately recognizable as Maples unless fruits were present. A few tender Maples are evergreen, and a considerable number of species, including hardy ones, have compound leaves, these usually with three leaflets, but with up to seven in the Box Elder. A few species have leaves with inconspicuous lobes; the Hornbeam Maple has leaves that are pinnately veined and lack lobes completely.

Maples are well known for the spectacular coloration of their autumnal foliage. In fact, they are among the most showy of woody plants in this respect. But other aspects of Maple foliage are decorative as well. Forms and cultivars of several species have colored leaves during the growing season, and the texture of the foliage of many is of unusual interest. All of these aspects will be considered in this section.

Red Maple (Acer rubrum). This species turns swamps and low woodlands throughout eastern North America into a blaze of scarlet in the fall. The brilliant color of the foliage and the abundance of the species make this Maple certainly one of the most conspicuous trees in our autumn landscape. The foliage of the Red Maple is also of interest during the growing season. The leaves are whitish on their undersurfaces, and the tree appears silvery when the leaves are rustled by a breeze.

A number of cultivars have been selected for their unusually good autumn coloration. Those available in the trade are briefly described below.

‘Autumn Flame’ — foliage turning a brilliant scarlet about two weeks before most other Red Maples.
'Bowhall' — foliage turning a brilliant scarlet; also attractive for its pyramidal habit.

'Morgan' — foliage color consistently brilliant, even on young plants.

'October Glory' — foliage turning brilliant red and persisting on the tree longer than in most others of the species.

'Red Sunset' — brilliant red-orange foliage lasting well into the season.

'Scanlon' — dark green foliage during the summer, turning bright red and orange in the fall; a compactly branched, conical tree.

'Schlesingeri' — foliage coloring rather a darker red at least two weeks before most other Red Maples.

Sugar Maple (Acer saccharum). Like the preceding, this is a common native tree in the eastern United States, although in the Southeast it is primarily a mountain species. The foliage is similar to that of the Norway Maple during the growing season, but the individual leaves are a brighter green, and they are somewhat more slender. The crown is also less densely branched, so the Sugar Maple casts a lighter shade than does the Norway Maple. The foliage is quite delicate and is susceptible to sunscald and spray damage.

Autumnal coloration is somewhat variable, but most commonly the foliage turns golden orange with a tinge of red. A mature specimen tree in full color is about as magnificent a plant as we can grow here in New England.

The two cultivars selected for their outstanding foliage characters are as follows:

'Green Mountain' — autumnal coloration about average for the species, but leaves waxy, dark green during the growing season and reasonably resistant to sunscald.

'Sweet Shadow' ('Laciniatum') — leaves deeply cut, turning bright orange in the fall.

Silver Maple (Acer saccharinum). Although its yellow autumn coloration is less spectacular than that of some of its relatives, the texture and color of the summer foliage of this species are outstanding among the Maples that grow to be large trees. The deeply cut leaves show their silvery undersides in the slightest breeze, accounting for the common name. The cultivar 'Laciniatum' ('Wieri') has more deeply cut leaves than the species, in addition to its somewhat pendulous branches.

Norway Maple (Acer platanoides). Although this is one of the most frequently encountered trees of foreign origin in the eastern United States, its shallow root system and the deep shade cast by its dense, dark green foliage usually destroy the lawns in which it is most commonly planted. Its clear yellow autumn coloration is desirable,
The foliage of the Silver Maple, showing the whitish undersides of the leaves. Photo: R. Weaver.

however, because it appears late in the season, after many trees have already lost their leaves.

A number of cultivars of this species are available in the American nursery trade. Those with colored or “improved” foliage during the growing season are described below. It must be pointed out, however, that these generally carry the same liabilities as the species. Further, the foliage of the red-leaved forms is coarse and characterless in my opinion. Although much cheaper and faster growing, these could never be a reasonable substitute for the Purple Beech, the only other large tree with similarly colored foliage.

‘Crimson King’ — foliage deep red-purple throughout the growing season.

‘Drummondii’ — leaves with a broad, fairly regular, white or yellowish margin.

‘Emerald Queen’ — foliage dark green and of heavy texture — probably a liability.

‘Faassen’s Black’ — similar to ‘Crimson King’.

‘Royal Red’ — foliage a clearer red than ‘Crimson King’ and ‘Faassen’s Black’.

‘Schwedleri’ — foliage red when emerging, turning rusty, then brownish and finally green.

‘Summershade’ — leaves large, dark green, with a heavy cuticle; quite resistant to sunscald.
Paperbark Maple (*Acer griseum*), Manchurian Maple (*A. mandshuricum*), Nikko Maple (*A. nikoense*) and Three-flower Maple (*A. triflorum*). The foliage of all four species is similar during the growing season. The leaves are compound, with three leaflets, and appear loose and airy in comparison with those of most other Maples. In the autumn the foliage of *A. griseum*, *A. nikoense*, and *A. triflorum* turns bright red or orange, that of the first being perhaps the least spectacular. The real standout in the group is *A. mandshuricum*, the foliage of which turns a unique and most attractive rose-red. It is also the hardestiest species, surviving quite well in Zone 4.

Japanese-type Maples. These wonderful small trees need little introduction. The foliage is outstanding in all of the species; each of them is distinctive, and each will be treated separately below. The descriptions of the cultivars are largely condensed from those in the catalogue distributed by Greer Gardens, where more than 80 forms of *Acer palmatum* are listed.

Vine Maple (*Acer circinatum*). This native of western North America, and the only species indigenous to this continent, is infrequently cultivated here in the Northeast. Although listed by Rehder as being hardy in Zone 5, it has not proved vigorous at the Arnold Arboretum. The leaves are broad, almost circular, with 7 to 9 shallow lobes, and the texture of the foliage is perhaps not as good as that of its relatives. Its autumn coloration, in shades of brilliant red, orange and yellow, is spectacular, however, even when grown in the shade of evergreens. The cultivar 'Monroe', the only dissected form yet described, has leaves that are finely cut in a most unusual manner. Its autumn coloration is as good as that of the species.

Siebold Maple (*Acer sieboldianum*) and Purplebloom Maple (*A. pseudosieboldianum*). These species are quite similar except for their flowers. The foliage of both is outstanding throughout the growing season, being a fresh green and of fine texture, although the individual leaves are not as deeply lobed as those of *A. palmatum*. Autumn coloration is bright red and yellow.

Fullmoon Maple (*Acer japonicum*). The leaves of this species are among the largest in the group, and their autumn coloration is about as spectacular as that of any woody plant. Being precariously hardy in Zone 5, the specimens at the Arnold Arboretum are rather poor and small. But they are still magnificent in the fall. The coloration is brilliant red and yellow, without a hint of purple, and the plants appear as if they were on fire at the height of the season. Two outstanding cultivars are:

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‘Aconitifolium’ — leaves large, so deeply cut as to appear almost compound; autumn coloration as good as the species.

‘Aureum’ — leaves of medium size, yellowish during the summer.

**Japanese Maple (Acer palmatum)**. This native of Japan is certainly one of the finest of all small trees, with its spreading habit, somewhat “layered” branches, and elegantly formed, deeply lobed, almost starlike leaves. Many cultivars have been selected for their outstanding foliage; all of them are beautiful. The few described below are grouped according to the character of their leaves. It should be noted that all of them develop their best form, and best colors, when grown in full sun.

*A. palmatum* var. *heptalobum*. Since this type occurs commonly in the wild it has been designated a botanical variety as opposed to a cultivar. The plants in general have leaves that are larger than normal, usually 7-lobed and with fine teeth. Many plants of this type develop a bright red autumn coloration, and the cultivar ‘Osakazuki’ is outstanding for its intense crimson display.

‘Atropurpureum’ group — leaves more or less of normal shape, but red during the summer.

‘Bloodgood’ — leaves perhaps the deepest red of any of the forms, and holding the color well throughout the summer; autumn foliage bright red.

‘Burgundy Lace’ — leaves deeply lobed, holding their deep red color well during the summer.

‘Oshio-beni’ — leaves more orange-red, the color lasting well.

‘Sherwood Flame’ — similar to ‘Burgundy Lace’, but holding its color better.

‘Dissectum’ group — leaves deeply divided, the 7 to 11 lobes deeply cut and separate almost to the base of the leaf; color green or red; form of the plant generally low and weeping.

‘Everred’ — one of the best red-leaved forms.

‘Filigree’ — leaves green with tiny flecks of white or cream.

‘Garnet’ — leaves a transparent garnet-red throughout the summer; a vigorous grower with bright red autumn coloration.

‘Viridis’ — leaves green, turning to gold in the fall; habit gracefully drooping; twigs green.

‘Waterfall’ — one of the most graceful of the green-leaved types; leaves divided into long segments.

‘Linearilobum’ group — leaves deeply lobed; lobes straplike and not cut; color red or green.
'Atrolineare' — leaves blood red.
'Linearilobum' — leaves green.
'Red Pygmy' — a round-headed shrub with red leaves.

**Variegated group** — leaves with regular or irregular white, yellowish or pinkish markings.
'Butterfly' — leaves tiny and blue-green with cream or pink margin.
'Roseo-marginatum' — leaves dark green with a pinkish margin and with irregular white streaks.
'Sagara-nishiki' — leaves dark green with scattered golden spots.
'Tsumagaki' — leaves green with purple tips and borders during spring and early summer.
Other Maples of interest for their foliage:

**Amur Maple (Acer ginnala).** This is one of the hardiest of all the species, and it is also tolerant of poor, dry soils. It is recommended for its brilliant red, scarlet or orange autumn coloration particularly in the Plains States where such a display is especially desirable.

**Box Elder (Acer negundo).** Although this is a rather weedy, weak-stemmed tree, it is almost as hardy as the preceding species, and it is recommended only for cold, dry areas. The autumn coloration of the species is a good yellow, and the following cultivars have colored leaves during the growing season.

- **'Aureum'** — leaves golden-yellow, the color persisting through much of the summer.
- **'Variegatum'** — leaflets and fruits with an irregular white border, in many becoming almost totally colorless.

**Mountain Maple (Acer spicatum).** Again a very hardy species, the autumn foliage turns shades of red and orange. Although the color is not as good as in *A. ginnala*, this tree has somewhat more character.

**Painted Maple (Acer mono).** A relative of the Norway Maple, this medium size tree is outstanding for its low, rounded crown. The foliage is fine-textured, the individual leaves being bright green, small and more or less star-shaped.

**Striped Maple (Acer pensylvanicum).** An elegant small tree with large 3-lobed leaves, this species is hardy in Zone 3. The foliage is attractive during the summer and turns bright yellow in the fall. Its Asiatic relatives (mentioned elsewhere) are equally desirable.

**BARK AND TWIGS**

Maples are variable in the texture and color of their bark. In most species it is quite thin, making the plants vulnerable to mechanical injury and therefore adding to their limitations as street trees. But on the other hand, the bark of many species is unusually decorative, adding greatly to the ornamental value of the plants, particularly during the winter. Following is an enumeration of the species with the most handsome or distinctive bark; most of them are illustrated on pages 157 and 159. The descriptions, except where noted, pertain to the mature trunks and larger branches.

*The foliage and flowers of Acer pensylvanicum, our native Striped Maple. Photo: P. Bruns.*
Paperbark Maple (*Acer griseum*). This is perhaps the most celebrated species as far as decorative bark is concerned. The bark has a waxy sheen, and on old trunks is smooth and mottled in shades of rich red-brown; that on less mature growth peels off in thin papery strips. The pattern and texture are exceptionally attractive, and they make this species one of the most desirable of all deciduous trees for winter interest.

Three-flower Maple (*Acer triflorum*). The bark of this species is a blend of cream, buff, and pearly gray-brown, with a waxy sheen, and splits into thin, irregularly shaped vertical plates. Although very different in appearance from that of its close relative, *A. griseum*, the bark of the Three-flower Maple is almost equally decorative.

Trident Maple (*Acer buergerianum*). The bark on mature trunks is basically buff with pale gray-brown patches and from a distance resembles that of the preceding species. The flakes or plates are thicker, however, more irregular in shape, and not oriented vertically.

Snake-bark Maples (*Acer pensylvanicum, A. davidii, A. tegmentosum, A. rufinerve, A. grosseri*). The bark is much the same in all of the species, being smooth and tight and basically dark olive-green, with vertical stripes of bright green and white, particularly on the branches. The common names "Snake-bark" or "Striped" Maples are derived from this bark pattern. The best species in the group are *A. davidii* and *A. grosseri*, both of which are precariously hardy in Zone 5; in these, the stripes are most pronounced. A cultivar, 'Erythrocladum', of our native *A. pensylvanicum* is also outstanding in that the twigs turn bright red after the leaves have fallen.

Japanese-type Maples (*Acer palmatum and A. pseudosieboldianum*). The bark on the trunks and the main branches is similar to that of the Snake-bark Maples, except that the basic color is medium gray and the stripes are dark gray. The twigs of the above species and several of their cultivars are decoratively colored. Those of *A. pseudosieboldianum* are an unusual gray-lavender, while many green-leaved *A. palmatum* have bright green twigs. A selection, 'Aoyagi', of the latter species is particularly outstanding in this respect, while another, 'Sango-Kaku' ('Senkaki'), the Coral-bark Maple, has bright red twigs in the winter.

Red Maple (*Acer rubrum*). The bark on the branches and the upper part of the main trunk is smooth and silvery gray. That on the older parts of the trunk becomes dark with thick plates, presenting an interesting contrast.

The bark of Maple species. Upper left, Three-flower Maple; upper right, Trident Maple; lower left, Paperbark Maple; lower right, Red Maple. Photos: R. Weaver.
Sycamore Maple (*Acer pseudoplatanus*). The bark somewhat resembles that of a Sycamore, hence the common name. It is darker in color, however, and basically in shades of gray rather than brown. The exfoliating plates also are thicker, tighter, and smaller.

Norway Maple (*Acer platanoides*). The bark of this species is about the thickest of any hardy Maple. It is dark gray-brown with a conspicuous network of tight, crisscross ridges.

Devil Maple (*Acer diabolicum*). "Elephantine" would be the best adjective to describe the bark of this tree. It is dark gray with a "pebbled" texture, resembling the skin of pachyderms.

FLOWERS AND FRUITS

Most everyone is familiar with the fruits of maples. They are certainly the most distinctive feature of the genus. Although their shapes vary considerably, the fruits (technically termed samaras) are always borne in pairs, the members tightly fused together, each with a broad, elongate wing and a single seed. They drop from the tree in pairs, and as they fall they spin like the blades of a helicopter, often landing a considerable distance from the parent plant. While the large and abundant fruits of species such as the Norway Maple are often considered a nuisance, those of other species are brightly colored and add to the decorative value of the trees.

Few people would think of growing Maples for their flowers. However, while none could actually be called showy, the flowers of most species are distinctly charming, and those of a number of species are, at least in my opinion, quite beautiful. Individually they are small, seldom exceeding 1/2 inch in diameter, and they are borne in rounded or elongate clusters which may be erect or drooping. The flowers are generally unisexual, with "males" and "females" present in the same cluster in many species, or on separate trees in others. The petals are red, whitish, or greenish, or occasionally absent; in many species they persist in good condition while the fruits are maturing.

The flowers are most conspicuous when they appear before the leaves, a normal occurrence in several common native and introduced Maples. The most attractive species, however, are those in which the flowers appear with the expanding foliage. Viewed with or against the foliage, the dark flowers of some produce a lovely contrast, while the greenish ones of others complement its already elegant texture. The best species for flowers and/or fruits are described below.

*The bark of Maple species. Upper left, Norway Maple; upper right, Sycamore Maple; lower left, Striped Maple (*Acer tegmentosum*); lower right, Devil Maple. Photos: R. Weaver.*
Silver Maple (*Acer saccharinum*). This species is included because it is one of the first plants to bloom in the spring. The flowers, which are borne in dense, tight clusters, and the expanding bud scales cast a reddish haze upon the trees in late February or early March — a time when any flower is a treasure.

Red Maple (*Acer rubrum*). Appearing later than those of the preceding species but still before the leaves are evident, the bright red flowers of the Red Maple contrast beautifully with its silvery gray branches. The young fruits are about the same color as the flowers, and due to their size are more conspicuous.

Sugar Maple (*Acer saccharum*). The delicate, yellowish, somewhat bell-shaped flowers gracefully drooping on long, slender stalks are almost superfluous on what is already one of the most elegant of large trees.

Norway Maple (*Acer platanoides*). The soft yellow-green, delicately fragrant flowers that cover this species just as the leaves are expanding help greatly to soften the curse of the monster that bears them, at least for a week or two. Individually quite large, and borne in clusters as much as 4 inches broad, the flowers make this species about the showiest Maple in bloom. Their contrast against the red leaves of such cultivars as 'Schwedleri' and 'Crimson King' is particularly striking. This species bears fruit prolifically, and the large samaras are a bit messy when they fall. The equally prolific seedlings that inevitably follow are a further annoyance.

Japanese-type Maples (*Acer circinatum*, *A. japonicum*, *A. palmatum*, *A. pseudosieboldianum*). The flowers are quite similar in all of these species, with conspicuous dark red to purple sepals and/or petals. They are borne in drooping or pendent, loosely globose clusters, each of these containing both “males” and “females.” The combination of the dark flowers and the fresh green, beautifully shaped leaves is truly exquisite, although this quality admittedly cannot be realized when the plants are viewed from a distance. In my opinion, the Vine Maple (*Acer circinatum*) is the most beautiful of the species in bloom, although the flowers of *A. japonicum* are by far the largest. In the red-leaved forms of *A. palmatum*, the leaves and the flowers are about the same color, and the latter therefore are not so effectively displayed. However, the fruits of these forms have reddish wings and provide a pleasing contrast with the darker foliage. The fruits of *A. circinatum* and *A. pseudosieboldianum* are also red, at least when young.

*The flowers and expanding foliage of (above) the Schwedler Maple (Acer platanoides 'Schwedleri') and (below) the Sugar Maple. Photos: R. Weaver, P. Chvany.*
Hornbeam Maple (*Acer carpinifolium*) and Snake-bark Maples (*A. capillipes, A. davidii, A. grosseri, A. pensylvanicum, A. tegmentosum*). The Hornbeam Maple is quite a different species from the Snake-bark types, but its aspect in bloom is similar, and therefore it is included with them here. To me these are among the most beautiful of the Maples, in bloom or otherwise. The pale yellow-green flowers are borne in long, slender drooping or pendent racemes. They are seen to best advantage from beneath, looking up into the canopy of the tree (see page 155). Although the individual flowers are delicately beautiful, the form of the inflorescences is more so, particularly in conjunction with the foliage. The young fruits produce about the same effect as do the flowers and therefore prolong the show. It must be pointed out, however, that these species are basically dioecious (separate “male” and “female” trees) and therefore only the “females” bear fruit.

Amur Maple (*Acer ginnala*), Mountain Maple (*A. spicatum*), Tatarian Maple (*A. tataricum*). Although related to the other two species included here, the Mountain Maple stands out in flower and fruit. The yellow-green flowers are borne in erect racemes as much as 6 inches long. They are followed by red fruits borne in the same manner. Both flowers and fruits are decorative. Like the preceding species, the Amur and Tatarian Maples bloom after the leaves have almost fully expanded. Their white flowers and red fruits are held in shorter clusters, and are conspicuous against the foliage.

**FORM AND SIZE**

The species and cultivars treated here are divided into three groups according to their size and form. Good and bad types are discussed in each group, as are appropriate or inappropriate planting situations. The form of trees is somewhat difficult to describe, except in terms of the ratio between the height and the width of the crown. The table below presents this ratio for representative specimens at the Arnold Arboretum. If the ratio is more than 2, the tree is columnar; if it is less than 1, the tree is more or less spreading. The trees are listed from the highest to the lowest height/width ratio; actual dimensions are given in parentheses.

**HEIGHT/WIDTH RATIOS OF REPRESENTATIVE MAPLES AT THE ARNOLD ARBORETUM**

3.6  *Acer saccharum* 'Temple’s Upright' (54 x 15 feet)  
2.5  *Acer platanoides* 'Erectum' (42 x 17 feet)  
2.2  *Acer saccharum* 'Newton Sentry' (60 x 27 feet)  
2.1  *Acer rubrum* 'Columnare' (63 x 30 feet)  
1.5  *Acer saccharinum* (103 x 88 feet)
The flowers of the Red Maple appear before the leaves have begun to expand. Photo: H. Howard.
The flowers and expanding foliage of “Japanese-type” Maples. Above, Acer pseudosieboldianum; below, A. palmatum ‘Burgundy Lace’.
Photos: M. Rosenfeld, P. Chvany.
The flowers and foliage of Acer pensylvanicum (above) and A. ginnala (below). Photos: P. Chvany, R. Weaver.
1.3 *Acer tegmentosum* (44 x 35 feet)  
1.2 *Acer platanoides* 'Schwedleri' (60 x 51 feet)  
1.2 *Acer triflorum* (36 x 60 feet)  
0.9 *Acer griseum* (35 x 39 feet)  
0.8 *Acer mono* (38 x 45 feet)  
0.8 *Acer tataricum* (30 x 39 feet)  
0.7 *Acer carpinifolium* (multiple trunks) (24 x 37 feet)  
0.7 *Acer palmatum var. heptalobum* (28 x 38 feet)  
0.7 *Acer palmatum* 'Sanguineum' (27 x 38 feet)  
0.7 *Acer pseudosieboldianum* (18 x 25 feet)  
0.5 *Acer capillipes* (multiple trunks) (26 x 50 feet)

Large Trees (more than 50 feet tall at maturity):

**Norway Maple (Acer platanoides).** In cultivation in this country, this species seldom grows more than 75 feet tall. The crown is typically even, dense and rounded, nearly as broad as tall. Although it is fast growing and cheap, and it has attractive flowers and good autumn color, the Norway Maple is not as desirable as most of the other species in this section. It tolerates air and salt pollution reasonably well, but its shallow roots cause heaving of sidewalks as the tree matures, therefore limiting its use for street planting. Grass cannot compete with a Norway Maple for water, nor can it survive in the dense shade cast by the tree. Therefore this species is also unsuitable as a lawn tree, unless the branches are periodically thinned.

The following cultivars are distinctive for their rapid growth: 'Emerald Queen', 'Jade Glen', and 'Superform'. 'Cleveland', 'Columnare', and 'Summershade' are more upright in growth than the typical Norway Maples, all developing a regular, broadly oval crown.

**Red Maple (Acer rubrum).** This relatively fast growing native tree develops an open, somewhat irregular crown at maturity. Height and spread seldom exceed 60 feet. The foliage is not dense, and this is an excellent lawn tree, at least in rural or suburban areas where air pollution is not a serious problem. It should be used as a street tree only where salt is not applied during the winter. The cultivars 'Bowhall' and 'Scanlon' are more upright growing and more symmetrical than the species.

**Silver Maple (Acer saccharinum).** Typically a tree with a tall, irregularly spreading crown, this is among the largest of all Maple species. Specimens more than 90 or even 100 feet tall are not unusual. Although it is a graceful and very beautiful tree, the wood is brittle, limiting its usefulness for planting along streets or close to buildings. The roots in addition have a reputation for invading water mains and sewer pipes.
Sugar Maple (*Acer saccharum*). A stately tree with a regular crown typically somewhat taller than broad, this species occasionally reaches a height of 100 feet. It makes a magnificent specimen tree for lawn planting. Although it casts quite a dense shade, grass generally does well beneath it. Sugar Maples cannot tolerate air pollution and they are unsuitable as street trees in areas where salt is applied during the winter.

Sycamore Maple (*Acer pseudoplatanus*). This European plant is similar to the Norway Maple in its mature size and form, but its crown is less dense. It is a stately tree with attractive bark, but its foliage is somewhat coarse. Perhaps this tree’s outstanding attribute is its salt tolerance, thus it is one of the best deciduous trees for seaside planting.

Columnar or Fastigiate Forms:

Several upright growing cultivars have already been mentioned, but these still have a rather broad crown. Those briefly described here are distinctly narrow, with the crown less than half as broad as tall. All of the following are more or less formal in aspect. They grow about as tall as their normal counterparts, but their spread will be less than half; they are also somewhat slower in growth. The number in parentheses following the names of the plants below is the height/spread ratio of the specimens at the Arnold Arboretum.

**Norway Maple (*Acer platanoides*).**

‘Erectum’ (2.5) — a narrowly upright form of rather graceful aspect; far superior to normal Norway Maples for street planting.

**Red Maple (*Acer rubrum*).**

‘Columnare’ (2.1) — less formal than many columnar forms because of its somewhat irregular outline; autumn coloration more orange than scarlet.

‘Armstrong’ — slightly narrower and more symmetrical than the preceding.

**Sugar Maple (*Acer saccharum*).**

‘Newton Sentry’ (2.2) — a beautifully shaped tree with a symmetrical, conical crown; very formal in appearance.

‘Temple’s Upright’ (3.6) — the narrowest of all the Maples discussed here; the branches very stiffly erect, the crown broadest at the top.
Medium Size Trees (30 to 50 feet tall at maturity):

**Painted Maple (Acer mono).** An exceptionally attractive plant, with a symmetrical, broad, low, umbrella-shaped crown, this species is unfortunately rare in cultivation. Maximum height is about 40 feet with a spread of slightly more. The texture of the foliage is similar to that of the Japanese Maples, but more dense. Casting a moderate shade, this is a fine specimen lawn tree.

**Paperbark Maple (Acer griseum) and related species (A. mandshuricum, A. nikoense, and A. triflorum).** All of these have unique ornamental features which were mentioned earlier, but they are similar
in size and form and therefore are treated together. They are cer-
tainly among the most desirable of all medium size trees for speci-
men planting. The crown is open, somewhat irregularly rounded
or broad oval, and many specimens branch a few feet from the
ground. Maximum height and spread is approximately 40 feet.

Snake-bark Maples (*Acer capillipes*, *A. davidii*, *A. grosseri*, *A. pen-
sylvanicum*, *A. ruifóvere*, *A. tegmentosum*). These again are fine
lawn trees where a specimen of intermediate size is desirable. All
are occasionally multi-trunked trees, and then they are spreading
and umbrella-shaped. More typically, perhaps, they grow with a
single trunk, and then the crown is irregularly rounded or oval.
Maximum height and spread is generally 30 to 40 feet (but see
*A. capillipes* in table above.)

Small Trees (12 to 25 feet tall at maturity):

*Amur Maple* (*Acer ginnala*) and *Tatarian Maple* (*A. tataricum*).
Both of these occasionally grow larger than 25 feet tall. Young
specimens are bushy in habit, but as they mature they assume a
broad moundlike or umbrella-shaped crown, with several trunks.
They can be grown with a single trunk, however, and then might
be useful for street planting when small trees are desirable. Suckers,
however, would have to be kept under control. Both of these species are quite hardy and tolerant of dry soils and would be good screen plants for colder areas.

**Hornbeam Maple (Acer carpinifolium).** Normally a spreading tree with several small trunks, this tree is very rare in cultivation. Its form and its unusual (for a Maple) foliage are most graceful, but autumn coloration is poor. It would be a fine tree for a patio where an informal effect is desirable.

**Japanese-type Maples (Acer circinatum, A. japonicum, A. palmatum, A. pseudosieboldianum, and A. sieboldianum).** These are certainly among the most elegant of small trees, and their landscaping uses are infinite. Most develop their best form in full sun, however, and they do not grow well in dry soil. The first two species listed above are not vigorous in Zone 5 and at least A. japonicum is often shrubby in this climate. The dissected forms of A. palmatum are also shrublike, the weeping branches forming a red or green mound at maturity. The remaining forms of A. palmatum, and typical A. pseudosieboldianum and A. sieboldianum form gracefully spreading small trees, with multiple trunks or with a single trunk branched close to the ground. The habit of all three is similar, except that the crowns of the last two are typically more open with the branches in more horizontal planes.

**HARDINESS**

All of the Maples mentioned in this article are hardy in at least Zone 5, although Acer davidii, A. grosseri, and A. japonicum are not vigorous there. A number of species are perfectly hardy further north. The hardiest species, and their hardiness zone according to Rehder are listed below.

*Zone 2*

- Acer ginnala (Amur Maple)
- Acer negundo (Box Elder)
- Acer spicatum (Mountain Maple)

*Zone 3*

- Acer pensylvanicum (Striped Maple)
- Acer platanoides (Norway Maple)
- Acer rubrum (Red Maple)
- Acer saccharinum (Silver Maple)
- Acer saccharum (Sugar Maple)

*Zone 4*

- Acer campestre (Hedge Maple)
- Acer mandshuricum (Manchurian Maple)
- Acer tataricum (Tatarian Maple)
- Acer tegmentosum (Manchurian Striped Maple)

*The low, weeping growth typical of the ‘Dissectum’ types of Acer palmatum.*

*Photo: D. Wyman.*
The habit of some small to medium-sized Maples. Above, Acer pseudosieboldianum; below, A. palmatum ‘Sanguineum’ in front of A. mono. 

Photos: R. Weaver.
NURSERY SOURCES

Following is a list of the Maple species and cultivars discussed in this article which are in the American nursery trade, together with the nurseries which have listed them in recent years. Addresses of the nurseries are at the end; those nurseries printed in capital letters are exclusively wholesale. The Maples with no sources given are generally available at any large nursery.

A. buergerianum — Gossler, Greer, HOLLANDIA, Mellinger’s, MONROVIA, SCANLON, Silver Falls, VIEWCREST.
A. capillipes — Greer, GULFSTREAM.
A. circinatum — COLE, Eddie, Fiore, Greer, Light’s, MALMO, Robin, Rosedale, Silver Falls, Siskiyou, TEUFEL, Wild Garden.
'Monroe' — Greer.
A. davidii — GREENBRIER, Greer, Gossler, HOLLANDIA, MELLINGER’S.
A. ginnala — too many sources to list.
A. griseum — too many sources to list.
A. grosseri (hersii) — Eddie, Greer, Gossler, HOLLANDIA.
A. japonicum —
’Aconitifolium’ — Brimfield, Greer, Raraflora, TEUFEL.
’Aureum’ — Brimfield, Greer, Palette, Raraflora, Spingarn, VERMEULEN.
A. negundo — too many sources to list.
’Variegatum’ — Raraflora, TEUFEL.
A. nikoense — Girard, Gossler, HOLLANDIA, Robin.
A. palmatum — too many sources to list.
’Aoyagi’ — Greer.
’Atrolineare’ — Greer.
’Atropurpureum’ — too many sources to list.
’Bloodgood’ — BOYD, GREENBRIER, Greer, HESS, HILL’S, LAKE COUNTY, MONROVIA.
’Burgundy Lace’ — COTTAGE, Greer, HESS, MONROVIA, Park, Raraflora, TEUFEL.
’Butterfly’ — Greer.
’Dissectum’ — too many sources to list.
’Everred’ — Brimfield, Greer, TEUFEL.
’Filigree’ — Greer.
’Garnet’ — Greer.
var. heptalobum — Greer.
’Linearilobum’ — Greer.
’Oshio-beni’ — Comerford’s, Greer, HESS, Jackson & Perkins, MONROVIA, Park, Raraflora, TEUFEL, VERMEULEN, Weston.
’Red Pygmy’ — Greer.
’Roseo-marginatum’ — Greer, HESS.
’Sangara-nishiki’ — Greer.
’Sango-kaku’ (‘Senkaki’, ‘Corallinum’) — Brimfield, Comerford’s, Greer, HESS, HOLLANDIA, TEUFEL, Tingle.
’Sherwood Flame’ — Greer.
’Tsumagaki’ — Greer.
’Viridis’ — Brimfield, Greer, HESS, Jackson & Perkins, TEUFEL.
’Waterfall’ — Brimfield, Greer.
A. pensylvanicum — Brimfield, Dutch Mountain, Gardens of the Blue Ridge, Greer, Sinclair.
A. platanoides and cultivars — too many sources to list, the following nurseries offer a large selection of cultivars: COLE, Fiore, LAKE COUNTY, Lafayette, PRINCETON, SCANLON, Sheridan, TEUFEL.


A. rubrum — too many sources to list.
'Armstrong' — BOYD, COLE, COTTAGE, Lafayette, LAKE COUNTY, Light's, Sheridan, TEUFEL.  
'Autumn Flame' — Atlantic, BOBBINK, BULK'S, COLE, Lafayette, Weston.  
'Bowhall' — COLE, Lafayette, LAKE COUNTY, TEUFEL.  
'Columnare' — COLE, Dauber's, Fiore, Lafayette, PRINCETON, Sheridan, TEUFEL.  
'October Glory' — too many sources to list.  
'Red Sunset' — COLE, COTTAGE, LAKE COUNTY, TEUFEL, Weston.  
'Schlesingeri' — HESS, HILL'S, Lafayette, TEUFEL, Weston.

A. rufinerve — Greer, Gossler, HOLLANDIA, MONROVIA, Tingle.

A. saccharinum — too many sources to list.
'Laciniatum' ('Wieri') — Fiore, Hinsdale, Robin, Sheridan, TEUFEL.

A. saccharum — too many sources to list.
'Green Mountain' — Bachman's, COLE, Corliss Bros., Lafayette, LAKE COUNTY, Light's, MILLCREEK, PRINCETON, SHENANDOAH.
'Newton Sentry' ('Columnare') — BOYD, Dauber's, Fiore, Lafayette, PRINCETON, SCANLON.
'Sweet Shadow' — Weston.
'Temple's Upright' ('Monumentale') — Brimfield, Cole, Dauber's, Fiore, HILL'S, PRINCETON, Raraflora, TEUFEL, Weston.

A. sieboldianum — Greer.


A. tataricum — COLE, COTTAGE, Dauber's, HILL'S, Valley.

A. tegmentosum — Greer, Tingle.

Addresses

Atlantic Tree Service, Inc.  
2 Church Street, Tariffville, Connecticut 06081

Bachman's, Inc.  
6010 Lyndale Avenue South, Minneapolis, Minnesota 55423

Bobbink Nurseries, Inc.  
P. O. Box 124, Freehold, New Jersey 07728

Boyd Nursery Co., Inc.  
P. O. Box 71, McMinnville, Tennessee 37110

Brimfield Gardens Nursery  
3109 Main Street, Rocky Hill, Connecticut 06067

Bulk's Nurseries, Inc.  
610 West Montauk Highway, Babylon, L.I., New York 11704

Cole Nursery Co.  
R. D. #1, Route 1, Circleville, Ohio 43113

Corliss Bros. Garden Center  
Essex Road, Ipswich, Massachusetts 01938

The Cottage Gardens, Inc.  
Rt. #3, South Waverly & Bishop Roads, Lansing, Michigan 48910

Dauber's Nurseries  
1705 N. George Street, Box 1746, York, Pennsylvania 17405
Dutch Mountain Nursery  
   Augusta, Michigan 49012

H. M. Eddie & Sons  
   4100 S. W. Marine Drive, Vancouver, British Colombia, Canada

Charles Fiore Nurseries, Inc.  
   Prairie View, Illinois 60069

Gardens of the Blue Ridge  
   Ashford (McDowell County), North Carolina 28603

Girard Nurseries  
   #4 North Ridge East, Geneva, Ohio 44041

Gossler Farms Nursery  
   1200 Weaver Road, Springfield, Oregon 97477

Greenbrier Farms, Ltd.  
   412 Thrasher Road, Chesapeake, Virginia 23320

Greer Gardens  
   1280 Goodpasture Island Road, Eugene, Oregon 97401

Gulfstream Nurseries  
   Wachapreague, Virginia 23480

Hess Nurseries  
   P. O. Box 326, Route 553, Cedarville, New Jersey 08311

Hill's Nurseries  
   Warsaw, Kentucky 41095

Hinsdale Nurseries  
   7200 S. Madison Road, Hinsdale, Illinois 61257

Hollandia Gardens  
   10125 37th Avenue NE, Seattle, Washington 98125

Jackson & Perkins Co.  
   Box 1028, Medford, Oregon 97501

Lafayette Home Nursery  
   Box 148, Route 17, LaFayette, Illinois 61449

Lake County Nursery Exchange  
   Box 122, Route 84, Perry, Ohio 44081

Light's Landscape Nurserymen  
   9153 East D. Avenue, Richland, Michigan 49083

Littlefield-Wyman Nurseries  
   227 Centre Avenue, Abington, Massachusetts 02351

Malmo Wholesale Nurseries  
   4700 25th Avenue, Seattle, Washington 98901

Mellinger's, Inc.  
   2310 W. S. Range Road, North Lima, Ohio 44452

Millcreek Nurseries  
   Corner Ketch, Route 3, Newark, Delaware 19711

Monrovia Nursery Co.  
   Box Q, 18331 E. Foothill Blvd., Azusa, California 91702

Palette Gardens  
   26 W. Zion Hill Road, Quakertown, Pennsylvania 18951

George W. Park Seed Co.  
   Greenwood, South Carolina 29646

Princeton Nurseries  
   Box 191, Princeton, New Jersey 08540

Raraflora  
   Fred W. Bergman, 1195 Stump Road, Feasterville, Pennsylvania 19047

Clyde Robin  
   Box 2091, Castro Valley, California 94546
Rosedale Nurseries  
Saw Mill River Parkway, Hawthorne, New York 10532
Edward H. Scanlon & Associates  
7621 Lewis Road, Olmstead Falls, Ohio 44138
Shenandoah Nurseries  
Box 99, 301 Wabash Avenue, Shenandoah, Iowa 51601
Sheridan Nurseries  
100 Sherway Drive, Etobicoke, Ontario, Canada
Silver Falls Nursery & Christmas Tree Farm  
Silver Falls Highway, Star Route, Box 55, Silverton, Oregon 97381
Siskiyou Rare Plant Nursery  
522 Franquette Street, Medford, Oregon 97501
Francis M. Sinclair  
R. F. D. 1, Newmarket Road, Exeter, New Hampshire 03833
Joel W. Spingarn  
1535 Forest Avenue, Baldwin, New York 11510
Alfred Teufel Nursery  
12345 N.W. Barnes Road, Portland, Oregon 97229
Tingle Nursery Company  
Pittsville, Maryland 21850
Valley Nursery  
Box 845, 2801 N. Montana, Helena, Montana 59601
John Vermeulen & Son, Inc.  
Box 267, Woodfern Road, Neshanic Station, New Jersey 08853
Viewcrest Nurseries  
9617 N. E. Burton Road, Vancouver, Washington 98662
Weston Nurseries  
Hopkinton, Massachusetts 01748
The Wild Garden  
George Schenk, 8243 N.E. 119th, Kirkland, Washington 98033
Arnoldia Reviews


This book is deceptive in title and as a result may be disappointing to the unwary. The subtitle might have read more properly, "Flowering Trees In A Florida Landscape." There are 211 numbered black and white photographs, many of poor quality, and but six colored plates to document the title. Within the first seven illustrations are Aesculus, Eucryphia and Magnolia, not otherwise mentioned in the text and species not grown in Florida. All others are of tropical or subtropical plants. With the exception of the foreword written in 1971 by George Lawrence and the acknowledgements, prologue, and possibly the single page on Barklya, the material has been published previously and in this volume reproduced by offset, retaining the original one- or two-column format.

Dr. Menninger's contributions have been enjoyable and worthwhile, descriptive and, often provocative, reading. This might be considered an anthology of many of his articles issued between 1951 and 1974. If so, it is regrettable that an effort was not made to correct the errors in nomenclature perpetuated here. Canangium, for example, is not correct in spite of the impression one derives from a forceful footnote, for Cananga (A. DC) Hooker & Thompson, is a conserved name. Stenolobium stans cannot be used since Bignonia stans L. is the type of Tecoma juss. and of Tecoma stans (L) Juss. as indicated in all recent tropical floras. Peltophorum pterocarpum (DC) Heyne is the correct name for P. inerme. Woody species of Datura are now generally recognized in the genus Brugmansia. Plates 146 and 147 are used twice, while the plates and text of many of the Bauhinia species are not in agreement, etc. The author states the chapters "are printed here just as they originally appeared, including many inconsistencies. Botanical nomenclature has undergone radical changes, word forms and compounds and even meanings have shifted in that time, but no matter." It does matter to many of us. This might have been a useful volume.

Richard A. Howard


First published in hard cover in 1963, this handbook has been an invaluable aid to all who are interested in wild flowers and their propagation. It is a pleasure to see it now in paperback, thus hopefully reaching an even wider audience.
Another review would be redundant, as this book over the years has been such a well-known and essential guide to every aspect of wild flower cultivation.

The excellent presentation, useful appendices on cultural requirements and bibliography, the comprehensive glossary and the lovely, delicate drawings by Catherine R. Hammond are still a delight to the reader.

CORA L. WARREN


This marvelously illustrated volume addresses itself to Rhododendron enthusiasts in every climate, whether they be homeowners, landscape designers, or nurserymen. It contains a comprehensive discussion of choosing, planting, and maintaining the plants, with a moderate position in respect to the chemical fertilizer/organic amendment controversy.

The heart of the work is, however, the presentation of more than two hundred color photographs judged by the reviewer to be of the highest quality. For example, the chromatic difference between Rhododendron elegans and R. superbum is accurately shown. There is a table of selected species and hybrids listing ancestry, plant height, month of bloom, and minimum temperature endured.

The presentation pays attention to the new dwarfs, so useful for foundation planting in the West Coast where the grower-author carries on his work; also considerable space is devoted to the rock garden use of Rhododendrons. This up-to-date treatment even includes material on greenhouse forcing of Rhododendrons, their display indoors, and the use of chemical growth regulators.

ELINORE B. TROWBRIDGE


An “American edition” of a successful British publication by the same name. The author has grown 130 of the 240 roses described and reports with pleasing personal impressions. An appendix lists where to see wild and old roses in botanical gardens in the United States. The colored plates are excellent. Regrettably no sources are given for the varieties, and a check of several specialty catalogues failed to list any of the plants sought.

RICHARD A. HOWARD


Travelers to Alaska (and residents of the state) interested in identifying the region’s beautiful wildflowers either have had to consult one of the floras that really were compiled for use by trained botanists, or had to try
one of the guide books for the Pacific Northwest or the Rocky Mountains that are not very applicable to Alaska. This book from *Alaska* magazine is designed to fill this void. For each of over 160 species there is a color photograph (more than one in a few cases), a line drawing, and a paragraph of text. At the end of the book is a short article on "Wild flowers in your garden" (throughout this section, it is emphasized that rare and endangered species are not to be molested), a glossary of botanical and ecological terms, a bibliography, and indices of the plants by family name, by botanical name, and by common name. The actual extent of involvement of E. Hultén, S. L. Welsh, and L. A. Viereck with this book is not clear, but if these three authorities on Alaskan plants approved the text and checked the identification of the photographs, then we may be sure that the material presented is accurate.

From a magazine such as *Alaska*, one would expect fine photographs, and, in general, those in the book are very good. The quality of printing is first-rate, and the color balance of most of the plates is tolerably accurate. A few photographs are out of focus and/or overexposed. For some reason, compilers of picture flowers books select the worst possible photographs for double-page spreads, and that certainly is the case with this book, particularly pages 50–51 and 138–139.

The simple line drawings are pleasing, accurate, and appear to have been drawn from living plants. Features not shown in the photographs, such as habit, underground parts, leaves, and fruits, are often depicted in the drawings. This combination of a colored photograph and a line drawing of each species enhances the usefulness of the book.

The paragraph of text associated with the photographs gives the height of the plant (a description is not given), the habitat, the geographical distribution of the species in Alaska and elsewhere, and other useful and interesting bits of information. Particularly noteworthy is the attention given to poisonous plants. Special boxes under Astragalus, Oxytropis, Castilleja, and Pedicularis point out the taxonomic complexities of these genera.

KENNETH R. ROBERTSON


It has been said with reverence and admiration that if the Lord created all plants, then ferns were made to show what could be done with a leaf. This excellent volume displays in text and photographs the range of variation in a significant section of the plant kingdom and the attractiveness and usefulness of non-flowering plants.

Ferns vary in size from a few millimeters to many meters in length and height. They may be floating aquatic plants, epiphytes, climbers or terrestrial in habit. Although most attractive for the variations in texture and division of the leaf, they may have color in pubescence on the stems, in the iridescence of mature fronds. Reproduction is generally by the production of spores in sporangia, or cases interestingly grouped on the backs of the fronds, or only on special fronds. From the spores develops a free living sexual generation. Asexual or vegetative reproduction occurs naturally with the production of "buds" on the leaf surface or at the tip. Several ferns meet the general name of "walking fern" when the arching leaf tip is capable of developing roots and a new plant.
The hardiness of the Boston fern, perhaps the most popular Victorian house plant, contrasts with the tenderness of the thin-leaved ferns often grown in bottle gardens. Pots of maiden hair ferns once decorated private banquet tables, and homes had fern rooms. This volume may return the fern to its rightful place in American horticulture.

Mrs. Hoshizaki writes for horticulture under the name of Barbara Joe. The bibliography clearly indicates her experience. Instructions are complete regarding the nature of ferns, their collection, introduction, maintenance and propagation. Genera of the cultivated ferns are treated in alphabetical order with useful species listed, and in summary form data are presented on height, form, and requirements for temperature, light, soil and water. One of the valuable appendices is a classification of ferns and fern allies. The index is excellent. Perhaps all that is missing is reference to botanical gardens that maintain collections of hardy outdoor ferns (e.g. Foster Botanical Garden, Garden in the Woods) or tender ferns in special display houses (e.g. Como Park, Kew, Longwood, Morris Arboretum).

Richard A. Howard


A technical reference volume that reviews the methods used by ecologists and phytosociologists of North America and Europe to describe and classify the vegetation on the earth. An excellent historical review of a special field of botany.

Richard A. Howard

DIVIDEND PLANTS

During spring of 1976 many members received a plant of Syringa nancieana 'Rutilant'. Because of a shortage of plant material, some of you had nothing but an empty mail box. The propagation department is busy rooting cuttings and, barring a crop failure, these will be mailed out during spring 1977 to all members who missed out on this year's mailing.
Albizzia julibrissin. Photo: P. Chevany.