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JEANNE S. WADLEY, Editor        MARCO W. REYNOLDS, Assistant Editor
                                  PETER J. CHVANY, Photographer

Cover: Crocus, fragile harbinger of spring. Photo: P. Chvany.
The Early Rock Garden

by GEORGE H. PRIDE

Here in the north it is hard to imagine anything that can give more pleasure to a gardener than a rock garden featuring hardy plants that bloom early in the spring. During the month of May in this area almost any rock garden can be spectacular without much effort; every bit of bloom that appears earlier, therefore, is prized in a special way. The plants capable of making a fine showing this early are really more numerous than most people realize, and with some judicious planning, the display can begin in early March. In fact, in my rock garden there are two plants, Narcissus bulbocodium 'Nylon', and Merendera sobolifera, that become so enthusiastic about being "first" in the spring that they frequently end up being "last" each fall.

Before going into discussions of plants it is well to set the stage. The main source of information for this article is a rock garden at the Case Estates in Weston, Massachusetts, that has been under my care for nearly ten years. Although it is a relatively small garden, it contains over 1,000 species and cultivars; the majority of them coming into bloom in May or soon after. This garden is in Zone 4.5 according to the Arboretum map, but I have found micro-habitats in it which allow plants to do well that normally would be much happier in warmer areas. There will be no effort to include every possible rock garden plant that might grow here; only those that I have had experience with in this garden will be considered. Most of the plants included are available from nurseries listed at the end of this article. A few however, like the merendera, will be difficult to obtain without much search, or through contacts in foreign countries. They will be worth trying to get, nevertheless.

To put some system into this large array of plants, it seems to make the most sense to discuss them alphabetically by genus. Then, at the end of the article there will be a listing by time of bloom.

Adonis, first in the list, is also among the first of my favorites in the early rock garden. I have enjoyed especially the cultivar 'Fukujukai' of the species A. amurenensis, which glows with a golden light and blooms from the middle of March to the end of April some years, depending upon the weather. This past spring, it was at its peak of beauty when the temperature reached 67° F on March 20th. This special cultivar is available from several sources.

A plant that waits until May to flower, but has a tidy appearance throughout most of the year, is Alyssoides utriculata. It is sometimes
Adonis amurensis 'Fukujukai'. Photo: G. Pride.

listed as a *Vesicaria*. The flowers are a greenish-gold shade. The seed pods that follow are inflated, making the plant one of the showiest in late June and July.

It would be hard to imagine a rock garden without anemones. *Anemone blanda* from Europe, flowering here in mid-April, is available in shades of pink, deep blue and white; a cultivar, 'Radar', is a brilliant purplish-red with a white center. The finest for me has been 'White Splendor', which persists and flowers well each year. The European Wood Anemone, *A. nemerosa*, is available in many colors and forms, all good. Perhaps the easiest and showiest of all is *A. ranunculoides*, the Yellow European Anemone, which asks only for a bit of extra moisture in the soil and full sun to establish itself and spread rapidly. It is especially fine here in April. The many colors and forms of what was once known as *Pulsatilla vulgaris* and is now usually called *Anemone pulsatilla*, with the common name of Pasque Flower, serve a double purpose in the garden. They flower in the middle of April, then produce large fluffy seed heads that are as attractive as the flowers. Ordinary soil suits them well. I have found 'Camla' to be an excellent cultivar.

Right: *Anemone pulsatilla 'Camla*'. Photo: G. Pride.
Anemone blanda. Photo: G. Pride.
The maddening problem of scientific name changes is especially common in rock gardening because so many different families, genera and species are involved. Once one has learned a scientific name for a plant it becomes unpleasant to have to learn a new name for an old friend. I grew up enjoying Anemonella thalictroides, the Rue Anemone, which some now consider a Thalictrum — giving us the odd name of Thalictrum thalictroides, which means the "thalictrum that looks like a thalictrum." In middle to late April this species and some of its very unusual or even strange cultivars make tiny, fragile, fascinating woodland-rock garden subjects.

Our wild Marsh Marigold is represented in the garden by the dwarf double flowered form, Caltha palustris 'Nana Plena', a very welcome addition in late April in a somewhat moist spot.

Chionodoxa, the Glory of the Snow, is commonly grown. C. luciliae seeds in easily and produces sheets of exquisite blue in early to middle April. Another species, C. gigantea, with larger but paler blue flowers is almost as easily adapted. The Chionodoxa cultivar called 'Pink Giant' is one of the most exciting of all early rock garden plants. I know of no other plant with flowers of this shade of pink blooming at this time in the rock garden. It is worth making every effort to obtain the bulbs. It will slowly seed in and should be isolated from the others to keep its "purity."
Reginald Farrer, one of the tartest-tongued gardeners to ever evaluate plants, referred to *Claytonia*, the Spring Beauty, as “pretty little weeds” becoming in a few years “an irrepressible pestilence.” They spread a candy-pink and white mist over the ground when they flower for a relatively long time during April, but the plants soon disappear completely until flowering time next year.

Several corydalis make excellent rock garden subjects. *Corydalis sempervirens*, our native Pale Corydalis, is definitely a weed in my rock garden, but a lovely one — especially in flower against greyish rocks. *C. bulbosa* and *C. densiflora* are far from weeds. The latter blooms near the end of March, and the former during the first week of April. They are both shy, non-spreading, attractive and eagerly anticipated each spring. They may be difficult to buy, but are worth hunting for.

I am sure that the average rock garden connoisseur would be shocked to know that the only draba I have succeeded with year after year is *Draba sibirica*. I look forward annually to its lacy masses of tiny golden flowers. It is as dependable as the seasons and is at its best in my garden during the first week of April.
Certainly crocus are the mainstay of the early rock garden. They are easy, colorful, problem-free and most welcome in the early spring. I have avoided the large-flowered hybrids and concentrated on the species *Crocus tomasinianus*, and the many cultivars of *C. chrysanthus*. The first is easy, persistent and lovely, though the flowers are somewhat fleeting. All cultivars of *C. chrysanthus* are early and worth growing. Some will start to flower in late February in favorable years and others will still be showy in early April. I have enjoyed immensely the cultivars 'Lady Killer', a rich purple edged in white;
'Gypsy Girl', golden yellow feathered purplish; 'Goldilocks', a rich yellow; 'Princess Beatrix', a magnificent shade of blue; 'Snow Bunting', the nicest white; and a brownish-gold called 'Zwanenburg Bronze'.

The composite family is conspicuously rare in the early rock garden. The cultivar 'Finesse' of Doronicum caucasicum (or should it be called D. cordatum?) is usually blooming by the middle of April with attractive golden daisy-like flowers on dwarf plants.

Dicentras are so well known, so generally easy, and so effective that all one needs to say is grow as many as you can. Both Dicentra cucullaria, the Dutchman’s Breeches, and D. canadensis, Squirrel Corn, prefer the woodsy side of the rock garden. Both are at their best in the early part of April; both seed in easily if they like their surroundings.

It is hard to imagine the early spring garden without Winter Aconite, and the species Eranthis hyemalis seems to be as good as any. Even though it is an extremely hardy plant, a bit of patience may be needed to establish it, but from then on it is with you forever.

Call them what you will, Adder’s Tongues, Trout Lilies, Dog-tooth Violets, or Fawn Lilies, the erythroniums all are very attractive, hardy, and mostly easy doers. They are at their best in middle April. I strongly recommend the violet-purple flowered Erythronium japonicum, the lavender-purple E. hendersonii, and the various cultivars of E. dens-canis, which come in shades of rose to purple-violet as well as white. Two of these that are especially striking and usually available are 'Frans Hals' and 'Snowflake'. Some erythroniums have delightfully attractive leaves mottled with reddish-brown.
A strange prostrate plant from the Mediterranean, *Euphorbia myrsinites*, is one of the few members of the euphorbia family to be of value in the rock garden. Despite its place of origin, it seems to be very hardy, flowering rather inconspicuously in middle April. It gives a different look to its special place in the garden.

Certainly the easiest of all the fritillaries is the Checkered-Lily, *Fritillaria meleagris*. Several cultivars are available, all excellent and easy to grow and all flowering in May with one exception: the earliest in my garden is 'Saturn', which flowers consistently in late April. All the cultivars are so hardy that bulbs heaved during the winter will go on flowering after being poked back in the ground.

Nothing says "Spring is coming" more clearly than the first snowdrops. Depending upon how sheltered the spot is, one may expect flowering any time from late January through February and into late March. *Galanthus nivalis*, the common snowdrop, is the only one I grow in the rock garden. It is usually at its best in late March.

I have never had a Christmas Rose flower for me at Christmas time. The species *Helleborus niger* and its subspecies *macranthus* are apt to be flowering from late March to middle April. Most gardeners know that one way to get the earliest and most perfect flowers is to place a low wooden box around each plant, leaving the top open and mulching heavily with deciduous leaves. Parting the leaves at the proper time will reveal flowers in excellent condition undaunted by the severest of weather.

*Hepatica*, both *H. acutiloba* and *H. americana* (*H. triloba*), and the Eurasian species, *H. nobilis*, flower from the last week of March to mid-April. I especially like the cultivar 'Ballard's Variety' with lovely soft lavender-blue flowers nearly an inch in diameter.

To those who grow only the tall bearded iris, the species and their variants in the early rock garden can be a revelation. Certainly *Iris reticulata* with its many forms and colors is the most interesting. They are excellent for rock gardens, easy to grow and flower, and increase reasonably well. They also stand up to very bad weather conditions which are apt to occur when they are in flower. The earliest in my garden is 'Springtime', which blooms in late March, followed by 'J.S. Dijt', 'Violet Beauty' and 'Harmony'. Later in April, 'Joyce' and 'Jeannine' are fine, and the latest has been 'Wentworth' — flowering in late April or early May. Thus, by careful planning, nearly a month and a half of these delightful iris may be enjoyed.

*Iris danfordiae*, with deep greenish-gold flowers, blooms early in April. It is spectacular, but many growers complain that after the first year of flowering the corms tend to split up into many small cormlets that take years to flower again. Two suggestions I have not tried that seem to work with others are to plant the corms much deeper than normal, and to feed the plants with weak solutions of manure water while they are in bloom, continuing until the plant dies down naturally. In middle March, *I. histrioides* and its cultivar
'Major' draw all attention to themselves. The flowers are an intense violet-blue and are large for the size of the plant. In 1976 a very heavy snowstorm occurred right after their flowers had opened with no noticeable harm.

A remarkable hybrid between *Iris histriodes* 'Major' and *I. danfordiae* is 'Katherine Hodgkins', which shows hybrid vigor and increases well. Its large flowers of a strange but attractive turquoise-chartreuse are unique. The flowering time is almost exactly between the two extremes of its parents. Expensive, hard to find now, and coveted by all who see it, it is bound to be grown widely when there is sufficient stock available.

Our native *Jeffersonia diphylla* and the Asiatic *J. dubia* have flowers that can best be described as fugacious. Were it not for the very attractive leaves and the equally unusual seed pods, the plants would be recommended with reservation. Known as Twinleaf, they flower in early April and are edge-of-the-woods rock garden plants.

*Merendera sobolifera*, a member of the lily family and a bulb that is rarely grown, has bloomed in late November and again in February through what appeared to be frozen ground. Admittedly it is not a showy plant, but its small, very ragged pale bluish flowers and tiny narrow leaves are very welcome in the desolation of late winter. It will be hard to find in any catalog. It is not mentioned in the new "Hortus III."

In a moist corner, the Virginia Bluebell, *Mertensia virginiana*, is a striking plant in mid-April. Dying down and disappearing soon after flowering, it can be grown in association with other plants that would normally follow it.

Many Grape Hyacinths are available for rock garden work and are easily grown and remarkably persistent. I especially enjoy the two that are earliest for me: *Muscari armeniacum*, the Early Giant Grape Hyacinth from Asia Minor, and the relatively new bright blue *M. tubergenianum* from N. W. Iran. These are followed by others that flower mostly in May.

If I were confined to growing only one kind of bulbous plant in the early rock garden, it would have to be *Narcissus*. Earlier I mentioned 'Nylon', a cultivar of *N. bulbocodium*, the Hoop-Petticoat Daffodil. This obliging plant has flowered beautifully for me in November and December as well as in April, which I suspect would be its normal flowering time here. I should emphasize that all the variants of this species are well worth growing. Anyone who has been fortunate enough to visit Wisley in England when the alpine meadow is in bloom will have seen an unforgettable sight of masses of these plants. The varieties *citrinus*, *conspicuus*, *obesus* and *romieuxii*, flowering mostly in mid-April, all are fine. Under ideal conditions these very hardy plants will be free-seeding and will build up colonies. Other very desirable species that provide great charm with only a few plants are *N. asturiensis* (*N. minimus*), which has a tiny deep yel-
low trumpet on a plant only 4 inches high; *N. cyclamineus*, blooming in early April; *N. rupicola*, a dwarf yellow daffodil flowering in middle April; and Angel's Tears, *N. triandus* var. *albus*, with an exquisite pure white nodding flower appearing at the same time. A species deserving special mention is *N. watieri* from the Atlas Mountains of Morocco. This tiny white jonquil blooms in April and seems to be completely hardy, but likes to dry out well in the summer. More gardeners should know it.

Named narcissus cultivars that are excellent for the rock garden in order of their flowering for me are 'Little Beauty' in early April; 'Little Gem'; 'Tete-a-Tete'; 'February Silver', despite its name, flowering in middle April; 'Trevithian', one of the finest of all jonquils; and 'Jumblie' in late April.

Pulmonarias, the lungworts, seem to be suffering from nomenclatural woes. "Hortus III" lists only four species. Other authorities list more and different ones. I have grown and enjoyed two in the moister part of the rock garden. *Pulmonaria affinis* flowers in early April with white spotted leaves and flowers opening pink and changing to purplish-blue. Blooming a bit later, *P. angustifolia* also bears spotted leaves and flowers opening pink but changing to a bright blue.

Looking much like a scilla and closely related is *Puschkinia libanotica*, which also is known as *P. scilloides*. It is very hardy and very early flowering, usually in full bloom by the first week of April. The flowers are watery blue with a dark stripe through the center of each petal and sepal.

The edge of the wild flower garden that blends into the rock garden is where I have grown the few primroses that I am able to enjoy. The true primrose fancier will be unhappy about the few that I have, but I have found that only a limited number persist under my conditions and perform well each year. *Primula × Juliana 'Dorothy'* is reliable for mid-April. The bright yellow 'Butterball' and rich red-purple 'Wanda' are both sure to be there each spring.

A pretty weed from Europe, *Ranunculus ficaria*, the Lesser Celandine, may be controlled by pulling up and discarding a good amount of it each year. Its blooming time is brief, around the middle of April, and its small golden yellow flowers soon disappear followed by the rest of the plant. One often forgets that it is there until it reappears the next spring.

I find the native bloodwort, *Sanguinaria canadensis*, seeds in easily all about the rock garden. Its brief but attractive flowers are welcome; but its amazing relative, the double-flowered form, is one of the few multi-petaled plants that can be accepted without a feeling of abnormality. This double-flowered cultivar is now quite widely grown and probably is correctly called 'Multiplex'. It is seedless and will last in flower a long time. In middle April the multi-petaled bloodroot is a brilliant sight in any garden, completely eclipsing its normal wild relative.
Puschkinia libanotica. Photo: P. Chvany.
All scillas appeal to me, but I have two favorites: the special form of *Scilla siberica* called 'Spring Beauty', which is larger in all parts than the species and to me a truer blue, and *S. tubergeniana* from Northern Iran, with pale blue flowers accented by a darker stripe in each segment. It will start to bloom in mid-March and last well into April. I understand a British authority claims it should be called *S. mischtschenkoana*. Take your pick.

In the wild garden/rock garden area, trilliums thrive. My favorite is *Trillium nivale*, the Snow or Dwarf White Trillium. In 1976 it flowered on March 14th and stayed in excellent condition for three weeks under very rough weather situations. At best it may reach 6 inches. If it likes its habitat, seedlings will appear and in time a colony will form. *T. grandiflorum* and *T. sessile* and its forms are hard to do without, although I think of them as wild garden subjects rather than as rock garden candidates.

Several species of tulip supply the brass in the spring orchestration. Crown in a sunny spot that bakes in summer, they persist for many years and are amazingly free from disease and troubles. Very early
and very lovely is *Tulipa pulchella* 'Violacea' which, as its name implies, has very attractive violet flowers and is at its best in the first week of April. It is soon followed by *T. greigii*, the many forms of *T. kaufmanniana*, and *T. linifolia*. This last is a showy dwarf of brilliant scarlet with a black center that opens out flat in bright light. Its brilliant shimmering red almost hurts one's eyes in the sun. Then comes 'Fusilier', a cultivar of *T. praestans*, followed by *T. tarda* and *T. turkestanica* in mid- to late April.

Finally I have many pansy and viola "volunteers" that pop up here and there in the rock garden. I will find them in bloom at almost any time of the year, but they are especially welcome in early March or April. This year a lovely blue, large-flowered one seeded into the crevices in the rocks above the gentian bed and was the last plant to flower, still greeting visitors in late December!

*Sanguinaria canadensis 'Multiplex'. Photo: G. Pride.*
Anemone blanda 'White Splendor'. Photo: G. Pride.
Flowering Times (very general)

February
Crocus (into April)
Galanthus nivalis (into March)
Merendera sobolifera

March (early to middle)
Adonis amurensis 'Fukujukai'
Eranthis hyemalis
Iris histrioides
Scilla sibirica, S. tubergeniana (into April)
Trillium nivale

March (late)
Corydalis
Helleborus niger
Hepatica
Iris reticulata (to late April)

April (early)
Chionodoxa
Dicentra
Draba siberica
Iris danfordiae
Jeffersonia
Narcissus cyclamineus
N. 'Little Beauty'
Pulmonaria affinis
Puschkinia libanotica
Tulipa pulchella 'Violacea'

April (middle)
Anemone
Doronicum caucasicum 'Finesse'
Erythronium
Euphorbia myrsinites
Mertensia virginiana
Muscaria (into May)
Primula
Pulmonaria angustifolia

Narcissus bulbocodium, N. rupicola, N. triandus var.
albus, N. watieri, N. 'February Silver', N. 'Little Gem', N.
'Tete-a-Tete'
Ranunculus ficaria
Sanguinaria canadensis
Thalictrum thalictroides
Tulipa greigii, T. kaufmanniana,
T. linifolia, T. praestans
'Fusilier'

April (late)
Caltha palustris 'Nana Plena'
Claytonia
Fritillaria meleagris 'Saturn'
Narcissus 'Jumblie', N. 'Trevithian'
Tulipa tarda, T. turkestanica
Shrubs and Shrublets

No treatment of the early rock garden is complete without a reference to these woody relatives which may or may not be in flower before May, but even out of bloom add immensely to the attractiveness and patterning of the garden.

A great pet of mine is Andromeda polifolia 'Nana' which looks well year round, especially when its charming flower bells appear in May.

Bearberry, Mealberry, Hog Cranberry, Sandberry, Mountain Box, Bear's Grape or Kinnikinick all are common names for Arctostaphylos uva-ursi. Providing no lime is in the soil, this native prostrate creeper can add greatly to any rock garden. Its pinkish-white flowers may start to open as early as late April.

The Dwarf Arctic Birch, Betula nana, is another favorite, rarely reaching 2 feet in height. It loses its dainty, tiny toothed leaves in the fall and regrows them rather late in the spring. I have never seen it in flower, but it is a fine addition to the rock garden even when leafless in winter.

Bruckenthalia spiculifolia, the Spike Heath, is an evergreen heath-like shrub and a fine addition to any rock garden. It rarely reaches a foot in height and it waits until June to produce its small pinkish flower clusters.

Heathers belong in every rock garden for the year-round effect and the texture they offer. For the most part they flower in late summer. The one I would like to single out from all others is Calluna vulgaris 'Foxii', which forms a slow growing, compact, dense green cushion. It produces a few wispy small pink flowers in late summer, but looks better without them the rest of the year.

Few gardeners I know have grown a remarkable plant from New Zealand called Carmichaelia enysii. I find no common name for this member of the legume family. It has congested, flat, light green branches and small pealike violet colored flowers that are fragrant and borne in great quantity in June. If it grows much above a few inches in height, rabbits seem to find it and chop it back. Try it in the warmest, sunniest spot in the rock garden. It is a treasure to be enjoyed at close range.

It is difficult to know what to say about the cassiopes. I have tried most of them and found them hard to please. They seem unhappy with my growing conditions and the little dwarf, prostrate whipcord-like branches have only rarely had a few tiny flower bells; a far cry from the magnificent things they can be when growing wild in their native areas. Try them if you want to struggle with something well worth the time and effort when you are successful.

Two daphnes, one common and one relatively rare in gardens, are worth their place in the rock garden. Daphne cneorum is well known
to gardeners and attractive most of the year though the flowers usually appear in May or later. A much earlier flowered daphne is *D. blagayana*, which bloomed last year on April 8 and was followed right after by a freeze of 12° F which badly browned the attractive pinkish-white flowers. Evergreen, straggling, and rarely reaching more than a foot in height, it has creamy pink flowers that are very fragrant and most welcome in the early spring.

The ericas or heaths are valuable shrubs for the rock garden the year-round but are appreciated especially for their early flowers in March. *Erica carnea* 'Springwood White' and 'Fox Hollow' are fine; somewhat later in April, 'Arthur Johnson' adds its pink bells to the garden scene.

Lavender is marginally hardy in the rock garden area. I have found the most satisfactory and permanent variety to be one that goes by the name of *Lavandula officinalis* 'Nana Compacta'. It is a beautiful, soft greyish-green all year-round; the small flower heads appear in mid-July.

To me, the most pleasing of all mints is *Mentha requienii*. It is not woody and plants will not live through the winters here, but once established, it produces tiny lavender flowers that in turn produce abundant seeds that do survive the cold to start new plants each year. It has three common names: "Menthella," "Corsican Mint," and the "Creme-de-Menthe Plant." The last name is very appropriate for no one ever forgets the wonderfully intense mint fragrance that this plant gives off when bruised. It may be enjoyed as a house plant and returned to the rock garden in the spring.

The Pieris that seems to be just right for rock gardens is 'Millstream'. A fine addition throughout the year, it is generous with its sprays of white bells in the first week of April. It is a highly recommended origination from the garden of Lincoln Foster in Falls Village, Connecticut.

The woody polygalas should be grown more than they are. *Polygala chamaebuxus* and its variety *grandiflora* (*P. chamaebuxus* var. *purpurea*) are fine, low, bushy plants and always enjoyable even though the small pealike flowers do not appear until mid-May.

Many potentillas are of year-round value in the rock garden. My favorite is *Potentilla rupestris* var. *pygmea*, a delightful prostrate shrublet that flowers in early May.

There is a wide selection of rhododendrons that can be great assets to the rock garden. The outstanding one in this garden has been *Rhododendron degronianum*, which received the Award of Excellence of the American Rhododendron Society and is sold as 'A. E. Form'. It is very dwarf, about 1 foot high, and yet has large clusters of deep pink flowers in late April or early May. Two others also have been very exciting. The very dwarf form of *R. keiskei* placed in the most sheltered niche in the whole garden is delightful even out of flower. The soft yellow flower bells may not appear until the first
part of May. A remarkable plant from Formosa is *R. nakaharai*, a little creeping evergreen azalea with brick-red flowers in June. It took several years to form a charming "bonsai shape" and this last year rewarded me with a few flowers. It is an attractive plant throughout the rest of the year even when not in bloom. It is supposed to stand temperatures as low as \(-10^\circ\ F\).

Other rhododendrons I can recommend either because of their low growth, attractiveness, or early bloom are *Rhododendron impeditum* and the hybrid clones 'Purple Gem' and 'Ramapo'.

I have grown only one willow in this garden. It is in the trade as *Salix \times moorei* and apparently is a natural hybrid between *S. herbacea* and *S. phylicifolia*. Hillier's catalog says it was found in Scotland. In "Shrubs For the Rock Garden and Alpine House," Heath claims it was found in Ireland. Wherever it came from it makes a low wide-spreading mound of slender green stems with small glossy green leaves. When my plant grew big enough to flower, it produced tiny reddish-yellow pistillate catkins early in the spring, well before the leaves came out. It is relatively slow growing; but there is a possibility of using it for a ground cover if it can be propagated readily. It has never reached a height of 1 foot in this garden.

I consider most thymes prostrate shrublet and like them all. This garden is fortunate in having a variety of species and variants that flower at different times, creating a succession of interest wherever they are.

Finally, one of the most charming spots in the rock garden is a clump of our native dwarf blueberry, *Vaccinium angustifolium*. Through all the seasons it is attractive. I especially enjoy the masses of small white bells which in turn produce quantities of fruit. They never fully ripen because the ever watchful chipmunks get them long before this can happen. In the nearly ten years I have grown this patch I have never been able to beat these varmints to a single ripe berry!
Sources of Plant Material

It has been said that there are two basic types of successful nurserymen: those who sell a great many very ordinary plants to a great many ordinary gardeners, and those who sell very rare and intriguing plants to the discriminating specialist gardener. Those listed below fall in the latter category. There are others, of course.

Alpenglow Gardens, Michaud & Co., 13328 King George Highway, Surrey, B.C. Canada.
Bovee's Nursery, 1737 S.W. Coronado, Portland, Oregon 97219
Greer Gardens, 1280 Goodpasture Island Road, Eugene, Oregon 97401
Edgar L. Kline, 17495 S.W. Bryant Road, Lake Grove, Oregon 97034 (wholesale)
Lamb Nurseries, E. 101 Sharp Ave., Spokane, Washington 99202
Oakhill Gardens, Rt. 3, Box 87, Dallas, Oregon 97338 (Sempervivums and sedums)
Oliver Nursery, 1159 Bronson Road, Fairfield, Conn. 06430
The Rock Garden, Litchfield-Hallowell Road, Litchfield, Maine 04350
Siskiyou Rare Plant Nursery, 522 Franquette Street, Medford, Oregon 97501
Weston Nurseries, East Main Street, Route 135, Hopkinton, Mass. 01748
The Wild Garden, Box 487, Bothell, Washington 98011

The American Rock Garden Society, 90 Pierpont Road, Waterbury, Connecticut 06705. This organization issues annually a very large and comprehensive list of seeds available to its members.

Left: Anemone pulsatilla
Scilla tubergeniana. Photo: P. Chvany.
References

The great majority of books written on rock gardening are published in the British Isles about plants growing there, and are for gardeners in that part of the world. A very limited number are written by Americans for American gardeners. Of the following five, two are so hard to obtain that the average gardener does not know they exist; one is by Bissland and the other by Hamblin. The Klaber book should be available with a little searching. The book by Foster is readily available and highly recommended, and the publication from the Brooklyn Botanic Garden is a "must."


Of the many foreign books that have become available in this country or have been reprinted here, the following are worth checking on:


All good rock gardeners should be members of the American Rock Garden Society in order to receive their very valuable publications. The true connoisseur also joins the Alpine Garden Society of the British Isles and the Scottish Rock Garden Society.
Winter Blooming Shrubs

by Richard E. Weaver, Jr.

Winters in the eastern part of this country south of Washington, D.C. are seldom as unpleasant as they are here in the Northeast. Of course the temperatures there are less extreme, but for those of us who appreciate plants and flowers, the real difference is perhaps due to the Camellias. Blooming through the worst weather that January and February have to offer, these wonderful plants with their bright and showy blooms make winter something almost worth anticipating.

Although there are some hopeful new developments through concentrated breeding efforts, we in most of the Northeast still must do without Camellias in our gardens. Nevertheless, there are a surprising number of hardy shrubs, perhaps less showy but still charming and attractive, that will bloom for us through the winter and the early days of spring. Some, such as the Witch Hazels, are foolproof; others present a challenge for they are susceptible to our capricious winters and may lose their opening flowers to a cold March. For those gardeners willing to take the chance, a few of the best early-flowering shrubs displayed in the border, or as the focal point in a winter garden, will help to soften the harshness of the season.

Many plants that bloom in the early spring have their flowers perfectly formed by the previous fall. Certain of these do not require a period of cold dormancy, and in mild climates will flower intermittently during the fall and winter. Most species, however, do require an environmental stimulus, usually a period of cold temperatures, before the buds will break and the flowers open. Occasionally these species will bloom in the fall, particularly if there has been a sharp drought during the summer, followed by a cool, wet period during the early autumn. The very early blooming shrubs discussed in this article are particularly prone to this abnormal fall flowering, and the expanded or partially expanded flowers are invariably frozen later, substantially diminishing their spring display.

Although the flowers of all of the species discussed here can withstand temperatures below freezing, they will be destroyed by extreme cold. In my experience, the flowers, except for those of the species that normally flower during the very cold months, will be nipped when the temperatures fall much below 20° F, those of several species will not take temperatures even this low. Therefore for best bloom, these latter early-blooming shrubs should be planted in a cold micro-

climate, such as an area of the yard that is somewhat shaded during the winter. Blooming then will be slightly delayed, reducing the chances that the flowers will be destroyed by cold temperatures in the spring, even though somewhat defeating the objective of having early-blooming plants. Alternatively, a spot by a sunny wall, or on the south side of a house, should be selected. Here bloom will come early, but air temperatures will be modified by the wall, again reducing the chances of having the flowers nipped. The latter exposure is preferable, particularly for those species that are somewhat tender, as well as for those that do not bloom well in shade.

The following plants are ones that can be expected to begin blooming before the end of March, or by the first week in April at the latest. All are hardy in Zone 5 except where noted. The list is not an exhaustive one; a few other shrubs sometimes bloom early enough to be included, for example the Shadbushes (Amelanchier spp.), the Cornelian Cherries (Cornus mas and C. officinalis) and Forsythias (especially F. ovata), but these have already been discussed in detail in recent Arnoldia articles and need not be repeated here. The arrangement of the plants is more or less by their order of bloom.

**Hamamelis — Witch Hazel**

The Witch Hazels are the premier winter-blooming trees and shrubs for northern areas of the United States. I have already discussed them in a recent article (see references), so their treatment here will be brief. The winter of 1976-1977 has been characterized by prolonged periods of cold weather, and the blooming time of the Witch Hazels has been delayed. Some plants of *Hamamelis virginiana*, our native species, were still in full bloom in early December, but abnormally cold temperatures during the first week of the month destroyed the flowers. Then a warming trend brought the Ozark Witch Hazel (*H. vernalis*) into partial bloom at least two weeks ahead of schedule. Very cold temperatures during the rest of December, all of January, and early February did not damage the partially expanded flowers of this species, but further bloom was delayed, and the plants were not in full flower here until the last week of February, a month or more late. *Hamamelis mollis* and the cultivars of *H. × intermedia* were also somewhat delayed. The former usually flowers here about the end of January, but this year the petals were not fully expanded until the end of February. Our wonderful specimen of *H. × intermedia* 'Arnold Promise' next to the Administration Building usually delights us with its profuse bloom in mid-February. As of this writing (1 March), the petals of its bright yellow flowers are just visible. We will be patient and will be rewarded, but this winter, more than most others, the touch of color the Witch Hazels usually provide would have been welcome a bit earlier.
Jasminum nudiflorum — Winter Jasmine

This native of China is a member of the Olive family, and its bright yellow flowers appearing on leafless branches suggest those of Forsythia, a much more familiar plant of the same family. Flowers of Winter Jasmine have six corolla lobes ("petals") instead of four, however. The sessile (stalkless) flowers, often nearly an inch across, are borne in pairs along the slender, green branches, beginning as early as mid-January in mild winters. The species is marginally hardy in the Boston area, although it is the hardiest of the true Jasmines, and it often does not bloom freely here unless it is grown in a sheltered spot. The plant itself is somewhat of a scrambler, with long, flexible branches. Because of its growth habit, and its unreliable hardiness, the Winter Jasmine is best grown against a sunny wall. It will have to be supported, however, because the plant is not actually a climber.
Chimonanthus praecox — Wintersweet

The common name of this Chinese native is well chosen, since its spicy fragrant flowers appear during the dead of winter. The shrub is not a familiar one in this country, and indeed it is virtually unknown to New England gardeners since it is hardy only into Zone 7. It blooms reliably in Philadelphia, but even there the flowers often suffer from exposure to wind and snow, and the plant is best grown in a sheltered spot.

Wintersweet is a relative of Calycanthus, our familiar Sweet Shrub or Carolina Allspice, and the flowers of the two are similar in overall structure. Those of the Wintersweet, however, are usually only about an inch across, and the fifteen to twenty petal-like segments are a translucent yellow, the innermost ones heavily streaked and blotched with purple. Several varieties with slightly different flowers are occasionally encountered. Chimonanthus praecox var. grandiflorus has flowers almost twice the size of those of the typical plant, but they are only slightly fragrant. The flowers of the var. concolor (var. luteus) are entirely yellow, and they often are sparingly produced.

Although cultivated in Japan for centuries, the Wintersweet did not reach Western gardens until the middle of the Eighteenth Century. In our gardens it forms a much-branched shrub as tall as 10 feet. The leathery but deciduous, prominently veined leaves are opposite on the twigs, and lance-shaped to oval in outline.

Like most of the winter-flowering shrubs mentioned here, the Wintersweet is not a showy plant. The flowers are perhaps more unusual than beautiful, and they are best appreciated close at hand where their wonderful fragrance is evident.

Erica — Heath

This genus, from whose name are derived the Latin and common names of a large and horticulturally important family of plants, includes several species and hybrids that are among the most charming additions to the list of winter-blooming shrubs. These are also low in stature, with finely-textured foliage, enabling them to be used effectively as complements both to the early spring bulbs as well as the taller shrubs that are the nucleus of the winter garden.

Although a number of Erica species grow to be trees, the hardy species, and particularly those included here, are low or even almost prostrate shrubs. The descriptions that follow pertain to the winter-flowering plants. The leaves are basically needle-like, spreading in whorls of four around the branches. The flowers are produced on the upper part of the branches, forming one-sided “spikes.” The flowers themselves, about ½ inch long, are narrowly bell-shaped or cylindric, with the brown to nearly black anthers protruding and conspicuously contrasting with the white to pink or purplish corollas.

Erica carnea vars. and dwarf Cryptomeria at University of Washington Arboretum, Seattle, Washington. Photo: D. Wyman.
Heaths grow and bloom well in full sun or partial shade. Like all members of their family, they prefer acid soils; Heaths evidently will flourish also in soils that are nearly neutral. The plants discussed below are perfectly hardy, but the bloom is apt to be more reliable and earlier if the plants are protected by pine boughs during the coldest months.

The hardiest species is *Erica carnea*, a native of the mountains of south-central Europe. Most cultivated forms of this species are very low growing with spreading branches, and they make a fine ground cover. The flowers of the wild plant are pale pink, but numerous cultivars have appeared with flowers ranging from pure white to deep reddish. The most commonly available winter-flowering cultivars are described below. In all of these, the flower buds are large and conspicuous by the beginning of the winter. Depending on the weather, they may open as early as January, but even if covered with snow the plants are usually in bloom by early March. Blooming continues for more than a month afterwards.

‘King George’ — Foliage dark green; flowers deep rose-pink with purple-black anthers; flowers freely produced on short spikes.

'Springwood Pink' — Foliage midgreen; flowers nearly white, gradually changing to clear pink; vigorous, spreading, and free-flowering.

'Springwood White' — Foliage bright green; flowers white with brown anthers; vigorous and spreading with long spikes of flowers.

The plant known as *Erica × darleyensis* is probably a hybrid between *E. carnea* and the tender *E. Mediterranea*. The flowers are similar to those of the first species, but the plants are more upright in growth, sometimes attaining a height of 18 inches. Although perfectly root hardy in Zone 5, cultivars of *E. × darleyensis* may suffer some winter damage here, and the blooming may not be profuse without the protection of a snow cover or a light mulch during the coldest months. This hybrid is represented by the following readily obtainable cultivars.

'Arthur Johnson' — Foliage light green; flowers mauve-pink in very long spikes, and therefore useful for cutting.

'Silberschmelze' — Foliage dark green; flowers pure white with brown anthers; free-flowering, and forming a neatly rounded plant.
Daphne mezereum (left) and D. m. forma alba (right).

**Daphne mezereum — February Daphne**

Although this delightful plant does not flower here as early as its common name implies, it can be relied upon to brighten our shrub borders from the last half of March through much of April. Besides providing welcome color during the drab first days of spring, the flowers are extremely fragrant, and they are followed in the late summer by brightly colored fruits.

The flowers are borne profusely in small clusters directly on the branches. Although they originally appear long before the leaves, some flowers may persist until the leaves are in evidence. The blooms are a bit unusual in that what appear to be petals are actually four colored sepals united into a tube. Their color is typically a dull pinkish-purple, but a whitish variant (*Daphne mezereum* forma
alba) is occasionally encountered both in the wild and in cultivation. The pink flowering plants produce bright red fruits in August and September while the white-flowered ones bear yellow fruits. The plants grow slowly to a maximum of 3 to 4 feet, and seldom need pruning, and they flower well even when grown in the shade.

Several very fine cultivars are grown in Europe, and if introduced into this country could greatly enhance the appeal of an already most desirable plant. They include: 'Paul's White' or 'Bowie's White', with pure white flowers; 'Grandiflora' ('Autumnalis') with larger flowers which, at least in England, appear from October through February; 'Rubra', with reddish-purple flowers; and 'Plena', with double white flowers.

Individuals of many Daphne species, including this one, have the disconcerting habit of flourishing for years and then suddenly dying for no apparent reason. Several explanations for this phenomenon have been offered, but none appears to be satisfactory. When conditions are just right, however, D. mezereum prospers, as evidenced by the fact that this native of Europe and Siberia has become naturalized several places in the United States and Canada.

Presumably because of their fleshy roots, Daphnes have a reputation for being difficult to transplant. However, by moving them in the spring and keeping them moist well into growth, I have not encountered problems, even with fairly large individuals.

It must be pointed out that all parts of the plants of Daphne species contain seriously poisonous compounds. They are basically attractive to children only when in fruit, so that danger of poisoning may be greatly reduced by removing the “berries” before they ripen.

**Corylus — Hazelnuts**

All of the Hazels bloom early in the spring, before the leaves have expanded. The plants are monoeccious; that is, with separate pistillate ("female") and staminate ("male") flowers borne on the same individual. The pistillate flowers are inconspicuous, obvious at all only because of the feathery red styles protruding from what merely appear to be buds. The staminate flowers are borne in long pendulous catkins that are in evidence throughout the winter. Usually during the last half of March, they elongate and open, exposing the yellow anthers and pollen. In many species the catkins are borne profusely. Although not exactly showy even then, the catkins are conspicuous and delicately beautiful, and the aspect of the plant is certainly pleasing. The familiar nuts, which ripen in midsummer, are an added bonus for growing these plants.

Perhaps fifteen species of Corylus are in cultivation, but only one will be singled out here. Selected clones of the European Hazelnut, C. avellana, are the primary source of the commercial Hazelnuts, and this species is one of the most attractive in flower. The catkins
Corylus avellana. Photo: H. Howard.
of this species, which is native through much of Europe, western
Asia and northern Africa, are often as much as 2½ inches long and
are borne in profusion. Two cultivars are particularly desirable be-
cause their growth habit adds greatly to their winter interest.

*Corylus avellana* ‘Contorta’, the original plant of which was found
in an English hedgerow in 1863, is certainly among the best of a
class of rather bizarre plants cultivated for their twisted and con-
torted branches. A mature specimen of this plant is striking indeed,
particularly in flower, with the vertically oriented catkins set off
against the network of intricately twisted branches and twigs. It is
available from a number of nurseries as “Harry Lauder’s Walking
Stick,” this picturesque name referring to the familiar prop of a
famous Scottish performer of an era before mine. The plant is slow-
growing, with the ultimate size perhaps 8 feet tall with a spread of
10 feet.

Much rarer in cultivation, *Corylus avellana* ‘Pendula’ is also a de-
sirable ornamental. The branches of this shrub are stiffly drooping,
forming a symmetrical, mound-shaped specimen at maturity. This
clone is occasionally grafted onto a standard. Although I have never
seen a specimen grown in this manner, the result, somewhat formal,
should be most attractive.

*Salix* — Willow

The genus *Salix* is a large one, with a wide geographic distribu-
tion, and it includes plants of greatly varying habit, from large trees
to prostrate shrublets. All of the species, however, are dioecious;
that is, with separate male and female individuals, as in Hollies.
The flowers themselves are minute and greatly reduced in structure;
the males consisting basically of only stamens, and the females of
a single pistil. Each is surrounded at the base by a scale-like struc-
ture that is often densely hairy. The flowers are grouped into clus-
ters of a type known as catkins. Those species with silky-hairy flow-
er scales and dense, compact catkins are commonly known as Pussy
Willows. These are among the most ornamental of the Willows, and
they are among our best-loved harbingers of spring.

A few of the species with the earliest and most ornamental catkins
are included in this article. Even with the unusually cold weather
this winter, the catkins of most of these were in evidence by the first
of March, even though the plants are not yet technically in flower.
In all Pussy Willows the male plants are more desirable horticul-
turally than the females because they are more attractive in bloom.
The slender yellow or reddish stamens provide a pleasing contrast
with the pearly gray of the rest of the catkin, and they are more
conspicuous than the stubby, green pistils of the female flowers.
The male catkins also are often denser and more compact than are the females.

If the plants are pruned back annually and generously fertilized, the new growth will be vigorous, unbranched, and floriferous. This provides good material for indoor arrangements; the branches sold in florist shops are the result of these cultural methods. Vigorous annual pruning also reduces the damage from the boring insects to which many species are so attractive.

The Pussy Willows available in the nursery trade are often hybrids of obscure origin. The following species are prominent in the parentage of many of these hybrids, but they are ornamental in their own right.

*Salix caprea*, the Goat Willow, a native plant through much of Europe and northeastern Asia, is perhaps the best known species. It responds well to heavy pruning, producing sturdy branches with darkish gray catkins almost 1\(\frac{1}{2}\) inch long; if not pruned back it will form a bushy tree as much as 25 feet tall. It is quite susceptible to borers.

The Daphne Willow (*Salix daphnoides*) is a native of Central Asia and the Himalayas. It is less well known than the preceding species, but is resistant to borers and considerably more ornamental. As the catkins emerge they are almost white, and contrasted against the red-bronze twigs, they are exquisite. When fully expanded they are about an inch long, soft pearly-gray, and very silky.

*Salix gracilistyla* is a beautiful Pussy Willow from Japan, Korea, and adjacent China. Unlike the two preceding species, this one is definitely shrubby, seldom growing taller than 10 feet. The pale silvery catkins are different from the preceding in that they are more or less cylindrical in shape; that is, distinctly longer than broad. This is one of the earliest flowering Pussy Willows.

The last "species" to be discussed here is a most distinctive Willow and one that has only recently become commercially available in this country. Its correct name, and its origin, are somewhat of a problem. It has passed as a variety of the preceding species, but it differs from *Salix gracilistyla* in a number of important technical characters, and it has never been found in the wild. It has been in cultivation in Japan for some time, and is perhaps a hybrid. For the time being at least we will call this Willow *Salix melanostachys*.

The most outstanding feature of this plant is its black catkins. Although they are only about \(\frac{1}{2}\) inch long, they are abundantly produced, and their color is truly striking, particularly with their brick red anthers which finally turn to yellow as they mature. Only the male form of this shrubby plant has ever been found. Those readers who are members of the Friends of the Arnold Arboretum can look forward to receiving a plant of this outstanding Willow in the spring of 1978 — barring crop failure, of course.
Lonicera — Honeysuckle

Two closely related Chinese species of this large and varied genus, as well as the hybrid between them, are indispensable additions to the winter garden. *Lonicera fragrantissima*, *L. standishii*, and their hybrid *L. × purpusii* (the last having appeared spontaneously in the botanical garden at Darmstadt, Germany), differ primarily in characters of foliage and pubescence. They are nearly equivalent from a horticultural standpoint, so they will be considered collectively here. It must be pointed out, however, that only *L. fragrantissima* is generally available in this country.

The Winter Honeysuckles form more or less erect shrubs with an ultimate height of approximately 6 feet. Their bark is pale brown with a papery texture and a somewhat ragged appearance. They are evergreen in mild climates, but in New England they are completely deciduous. As implied by the Latin name of the commoner species, the flowers of these plants are exceptionally fragrant. The fragrance is distinctive and pleasant, spicy with a hint of lemon.

If the buds are not injured by frosts in the early autumn, or by extreme cold in March, the ¾-inch, translucent white flowers with their projecting yellow stamens begin to appear in Boston just as
winter technically ends. In good years the bloom is generous, but the shrubs are never by any means “covered with flowers.” The Winter Honeysuckles are excellent for cutting, and branches can be easily forced into bloom as early as January. In the home, close at hand, the delicate flowers with their wonderful fragrance are much more charming than Forsythias could ever be.

**Viburnum**

The genus *Viburnum* includes a large number of plants of outstanding horticultural value. Many species are ornamental in flower, fruit, and autumn color, so they are exceptionally versatile in the garden. The versatility of the genus is further enhanced by the flowering periods of the various species that span almost the entire year. *Viburnum farreri* (formerly *V. fragrans*) blooms early enough in New England to be included in the winter garden. Here this native of China produces a generous display of intensely fragrant, pink tubular flowers in roundish clusters before the end of March in good years. In milder climates, the flowers appear intermittently during the fall and winter, and not infrequently here at the Arnold Arboretum a few will open just in time to be nipped by the first frost. The foliage appears quite early and remains in good condition during the growing season, taking on a bronzy tint during the summer and finally turning maroon in the fall.

Several variants of the species are in cultivation. *Viburnum farreri* var. *album* has pure white flowers that are slightly larger than those of the typical plant, and they also appear perhaps a week earlier. The cultivar ‘Bowles’ has deeper pink flowers.

*Viburnum × bodnantense*, a hybrid between this species and the tender *V. grandiflorum*, has been produced several times. A selection from the cross that was made at the famous Bodnant Gardens in Wales has been given the cultivar name ‘Dawn’: this is the clone now in general cultivation. This plant is a better garden plant than either of its parents for us in the Northeast. It blooms slightly later and more profusely than *V. farreri*; the flower clusters are looser, and the flowers themselves are deep pink in bud but fading to a blush as they mature.

**Rhododendron**

March is hardly a month when most New Englanders start to look for Rhododendrons and Azaleas in bloom. However, two closely related species can be counted on to add a splash of color to the drab landscape before the month is out. The color of the blossoms of both species is typically lavender to rose-purple, colors that many people find objectionable in flowers; but at this time of year, who can be choosy?

*Lonicera standishii*. Photo: H. Howard.
Viburnum farreri var. album. Photo: D. Wyman.
The difference between Rhododendrons and Azaleas is often a point of confusion, and this is not the place to enter into a taxonomic discussion. Both types of plants are generally classified botanically in the genus *Rhododendron*, but as distinct subgenera. The species discussed here are technically Rhododendrons, even though they are usually deciduous and would easily pass as Azaleas to the non-botanist.

*Rhododendron dauricum*, the Daurian Rhododendron, is the first of its genus to bloom in New England. The flowers, 1 to 1½ inches across, from clustered buds near the ends of the branches, generally begin to appear during the last week of March. Typically the small leaves are deciduous in the fall, but var. *sempervirens* is partially evergreen even in our climate. This species is horticulturally less desirable than the following, and it is not commonly grown. It is perhaps best known indirectly, since the evergreen variety is one of the parents of the increasingly more popular PJM Hybrids.

The Korean Rhododendron, *Rhododendron mucronulatum*, is a first-class garden plant. It is vigorous, hardy, and floriferous, perhaps the showiest of the early-blooming shrubs. It is completely deciduous, and the flowers usually appear at the very end of March, long before the leaves which might hide their glory. The species, growing as tall as 6 to 8 feet, is widely distributed throughout northeastern Asia, and the flower color is variable both in the wild and in cultivation. Most commonly, the 1½- to 2-inch, widely open blooms are a pale rosy-purple; several darker flowered variants have been named, but they are not yet commonly available. A clear pink-flowered seedling appeared among a population grown by Mr. Henry Skinner at Cornell University in the 1930's; this selection, named 'Cornell Pink', is now widely distributed, offering an attractive alternative for those people who do not like the flower color of the typical plant. A white-flowered variant (forma *albiflorum*) has been found in Korea, but it is not yet widely known in cultivation. Another series of variants recently discovered at high elevations in Korea may eventually lead to the development of dwarf forms of exceptional horticultural merit.

References


Rhododendron dauricum. *Photo: H. Howard.*
NOTES FROM THE ARNOLD ARBORETUM

Storm Damage

by Gary L. Koller

This winter, storms with rapidly dropping temperatures, great snow accumulations and winds fluctuating from gentle to severe struck much of the Northeast. These conditions will cause the 1976–77 season to be long remembered for the discomfort and inconvenience caused to people across the nation. What may be overlooked or forgotten is the effect this winter phenomenon had on plant life.

In late autumn, Boston temperatures dropped quickly and hovered around zero. Although not dramatic, it was unusual for cold weather to arrive so early with a lack of snow to insulate and protect the soil. This allowed quick and deep penetration of frost into the ground and it struck the plants before they were fully acclimated to the full brunt of winter. Such a combination is particularly harmful to newly planted, semi-anchored plants as well as those marginally hardy specimens that are the delight of avid gardeners. Those who were wise and energetic applied a deep mulch in order to slow frost penetration and extend the growing season in the root zone. This one effort may have saved many fragile specimens.

On the 7th of January, Boston was struck by a snow storm that deposited 15.4 inches of snow in a 24-hour period. Even though the wind velocity was relatively low and there was little ice accumulation, many trees and shrubs suffered great structural damage. This resulted from the build-up of snow in the dense, twiggy branch structure which allowed ever increasing amounts to accumulate. Plants are remarkable in the stress they can endure, but the tremendous weight along with the occasional gusts of wind overcame their endurance and resulted in split crotches, sheared off branches, shattered limbs, and bent and twisted shapes.

At the Arboretum, minor damage affected specimens in all areas; however, in the area from the Administration Building to Bussey Hill damage was severe on the following plants or plant groups:

- Acer sp.
- Amelanchier sp.
- Betula sp.
- Celtis sp.
- Cornus florida
- Maackia sp.
- Magnolia × soulangeana
- M. virginiana
It saddens one to see stately specimens fifty to seventy-five years old ruined so quickly. In some instances a severely damaged plant represented our only specimen of a particular taxon. *Maackia chinensis*, for example, was full and picturesque and is now gaunt and pathetic looking. Its present appearance does not do justice to the species, however, this specimen cannot be removed until it is propagated and replaced. So it remains, attesting to the brutality of nature.

Visitors occasionally remark about broken stubs or large wounds on Arboretum plants and regard them as poor maintenance. What is overlooked is the fact that our maintenance staff gets so little help from the New England climate. Further south, winter snow and ice storms are infrequent and less severe, allowing gardens to display a larger percentage of perfect specimens. In the light of our problems, our plants are well maintained in terms of good arboriculture practices.

The positive approach to storm-damaged trees is not to lament the loss of a majestic specimen that cannot be restored to its former splendor; instead, the plant must be evaluated for the potential development of new artistic beauty or enhanced character, which can be by-products of breakage. Examples are the magnificent and stately white pines of New England that show the ravages of many storms, yet add a distinct flavor to the New England landscape.

Examples follow of some of the types of damage suffered by the Arboretum’s collection this winter, along with remedial measures taken by our maintenance staff.

*Long branches with insufficient girth have split from the weight of heavy ice and snow. Such damage can be reduced by occasional preventative thinning of the canopy.*

*The injured branch should be cut back to a large lateral limb, or to the trunk. On rare and valuable trees, fresh wounds sometimes can be pulled together, secured with bolts, and covered with grafting wax. Natural grafting will ultimately unite the tissue, but the branch will remain structurally weak. As a precaution against further injuries, thinning of the terminal end will be necessary. All photos: G. Koller.*
Split crotches result when increasing stem girth and opposing canopy weight cause stress on narrow crotch angles, creating a structural weakness susceptible to storm damage.

Preventative measures should begin early. In choosing small trees, avoid those with narrow, V-shaped crotches. Trees in your yard with this flaw should have their branches pruned flush with the crotch; the wounds will heal quickly and new branches soon will fill out the symmetry of the plant.

Structural weakness caused by years of stress made this crotch a prime candidate for winter storm damage.
Note the dark area at the upper edge of the wound. This indicates that a cleft due to physical stress had begun, along with disease-associated deterioration. Heavy snows, added to the existing stress, caused the limb to be ripped away at the crotch.

Once damage has occurred, the injured branch should be pruned flush with the trunk, and the ragged edges of the wound made as smooth as possible. Eliminate hollow areas that might trap and hold water, fostering the growth of disease organisms. Painting large wounds with tree paint is primarily cosmetic.
Left: Ice, snow, and wind can bend or twist structurally weak plants, sometimes causing a permanent change in configuration or irreparable breakage. In early autumn, susceptible plants should be staked, bound together with lacing, or covered with burlap to prevent or minimize damage.

If possible, accumulated heavy snow should be brushed off gently. Ice and crusted snow tends to cling to branches and foliage, and wood can be brittle when temperatures are low and external stress is great. Once damage has occurred, bent plants must be staked, sometimes permanently. Plants with flayed-out branches must be pulled back into their normal shape and belted or cabled into place.

Stripped bark, often the result of storm damage, also frequently results from incorrect pruning practices or mechanical damage from automobiles and grounds-care equipment. The large wounds that may occur are difficult or impossible for the tree to cover with protective bark.

If the injury is fresh and the flap of stripped bark is partially attached, the injured branch may be pruned away and the bark flap often can be pushed back into place and secured with nails. Exposed edges should be covered with grafting wax or wrapped with moist sphagnum moss. Natural grafting should result.
Plant Names. T. S. Lindsay. Detroit: Gale Research Company. viii and 93 pages. $8.00.

This book, first published in 1923, begins with the premise that there is an unreasonable prejudice against the use of scientific plant names and that if the author's fellow gardeners could understand the meanings of "those long, weird" Latin names, they would remember the names more readily. His introductory chapters give a very good defense for the more widespread use of Latin binomials of garden plants, and a brief history of plant naming. However, the discussion of current principles and rules of nomenclature is out-dated. Since 1923, the International Botanical Congress has published several revisions of its Code of Botanical Nomenclature and there are other books which more clearly interpret this code for the non-botanist. The remaining chapters of this book consist of lists of plant names and their meanings organized in rather arbitrary, whimsical groups. Emphasis is on popular British garden plants.

Anyone who knows garden plants by either common or scientific names may be interested to know how these names came to be and what their meanings signify. Much of this fascinating and amusing information is presented; however, throughout the book, common and scientific names are treated equally and no clear distinction between them is made. This could only be confusing to anyone interested in learning the correct names for plants.

IDA BURCH


The preface indicates that the original publication was titled "Plant Propagation" and was favorably received. This first American edition is of the revised British edition and should be received with favor. The volume is attractive, with excellent color and black and white photographs, and many drawings. Twenty-three chapters from general principles to pests and diseases in relation to propagation offer encyclopedic coverage. This will meet the requirement for a single volume on plant propagation for the home owner who has trees, shrubs, annuals and perennials, vegetables, and even aquatics. It could serve well as a textbook in courses in horticulture. Seven pages of four columns, and over fifty entries in each column comprise a good index and indicate the coverage of this volume.

RICHARD A. HOWARD


This moderately expensive book is an account of the efforts of the Garden Club of Virginia over approximately a fifty-year span (from 1928 through the early 1970's) to restore and preserve twenty-two gardens of historic interest in Virginia. It is interesting to note that the financing for this enormous project was initially accomplished by a statewide tour of private homes and gardens, with the proceeds used to finance the restorations. Admission fees to the restored gardens have made the endeavor self-perpetuating.
The author details specific problems of each restoration in addition to a physical and historic description of each garden. Reproductions (some not too readable) of the documents, plans, and illustrations used in the restorations and many excellent pictures, some in color, comprise a large portion of the book. Lists of the plant materials used in each garden are also included.

This book might have specific appeal to the student of landscape architecture or to an individual (or group) contemplating restoration of an old garden. It also offers the traveling gardener (including the armchair variety) a chance to acquaint himself with Virginia's superb garden heritage.


“Our purpose in this book will be to make a wide ranging survey of the trees of the Temperate Zones and to select from among them those that can most profitably be put to use for man's delight. We do so as a contribution to those movements, so far all too weak, that aim to bring home to men's minds the social and aesthetic consequences of the wastage and neglect of the trees around us and to stir those in authority to more effective action.”

The authors accomplish this tastefully and effectively by first telling of the relation of trees to their environment — soil, wind, salt spray, temperatures, sun and shade, of their use in landscaping from private gardens to city planning projects; and how to transplant and prune them. The remaining and largest part of the book is a register of “the majority of the ornamental trees that can be successfully grown in the Northern Temperate Zone.” This register is both more and less than a manual. More because it provides lore, word origins, historical items, horticultural uses, and aesthetic values; and less because the taxonomic descriptions are sprinkled in rather informally. The illustrations are a combination of black and white and color photos and excellent line drawings for identification.

Highly readable, it will be of interest to all, amateur or professional, novice or expert, British or non-British.


The excellent format, fine paper and marvelous plates immediately identified this book as of foreign origin. Planned by the Chanticleer Press of the United States, it was printed in Italy and is of fine quality indeed.

This work is intended as a field guide and uses a dichotomous key based upon flower color. The book commences with a very brief exposition of botanical nomenclature, including useful line drawings of plant parts. There is an excellent glossary at the beginning, where it belongs, rather than at the end.

Because the photographs, all good, were selected from so many sources, the scale of various plants is inconsistent from one photo to another and this is one major flaw in the book. A second, smaller, drawback is that the common name accompanies each photograph, leaving us to search the text or the excellent index for the botanical name.

In general, this is a truly delightful and useful work. Because of its expense, however, many of us will have to consult it in the library, rather than at home or in the field.

How the writer would have treasured this on a recent visit to the Rocky Mountains! The authors are professional biologists and they emphasize the uses of wild plants in their contemporary, ecological, medical and other contexts. The editorial style is particularly agreeable. It flows naturally and reads as the work of enthusiasts rather than sentimentalists.

The photographs are excellent and the plants are shown as one might actually see them—on one’s knees, combing the foliage and searching inquisitively for the elusive blooms. A very instructive and delightful volume.

ELINORE B. TROWBRIDGE


We welcome this paperback, low priced edition of a well written, informative, enjoyable book. A sun-heated pit greenhouse is within the capabilities of nearly every home owner. It is relatively economical to build, maintain and operate and requires little space. A remarkable variety of plants can be grown. This is a “how to do it” book by experienced authors. Their successes and failures are described with equal enthusiasm and their suggestions and warnings are well founded. An extensive listing of plants for pit and cool greenhouse has the cultural details of what the authors say “has worked for us.”

RICHARD A. HOWARD


Since 1935 Robert T. Clausen of Cornell University’s Wiegand Herbarium has devoted much of his time to the study of the North American species of the taxonomically complex genus Sedum. His labors have resulted in two volumes, Sedum of the Trans-Mexican Volcanic Belt (Cornell University Press, 1959), and more recently, the book noted here. This latter work, like the first, includes an almost overly detailed and labored statistical analysis of the thirty native species, while containing material usual in a monographic treatment, viz. keys, descriptions, distributional, cytological, and ecological data, and nomenclatural and biological information. Other sections of the book synthesize geological and geographical data with the evolution and interrelationships of the species. The concluding chapters, moreover, deal with naturalized species and those cultivated but not native in North America. Closely allied genera of the Crassulaceae that occur in North America are also treated.

The volume is beautifully illustrated with line drawings by Elfriede Abbe, which are supplemented by numerous photographs and distribution maps. While botanical libraries and persons with a deep interest in Sedum will require this book on their shelves, the price alone will discourage its purchase by those with only a moderate interest in these diverse succulent plants.

STEPHEN A. SPONGBERG

Iris reticulata ‘Springtime’. Photo: P. Chvany.