

ROCK GARDEN *Quarterly*



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Front cover: *Townsendia condensata*. Painting by Cindy Nelson-Nold.

Back cover: Alpines on Mount Sefton, New Zealand by Dick Redfield.

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ROCK GARDEN *Quarterly*

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Special Issue: Rock Gardens on the North Atlantic

This winter issue focuses on the site of this summer's NARGS Annual General Meeting, held in one of the Society's more remote outposts in St. John's, Newfoundland. Those who attend can look forward to seeing the picturesque coast and harbor towns of Canada's Atlantic coast, as well as its wild flora and public and private gardens. Some of the plants and gardens are introduced in this issue. For more information on the meeting, see the brochure mailed with this issue and the display advertisement in the ad section.

As we learned a few years ago when we focused on Alaska, in these northern latitudes we often can observe near sea level plants that exist only at alpine elevations in the lower latitudes. Without taking a deep breath, we can enjoy cushion saxifrages and *Silene acaulis* in the wild, even within sight of breaking surf.

This is true on other continents besides North America. Steven Barstow writes: "Trondheim, Norway, has a good botanical garden, although it is relatively young (see <http://www.ringve.com/english/botanical.html>). An interesting feature is the collection of mostly high-latitude trees arranged by region around a pond (representing the Arctic Ocean). Most interesting for a rock gardener is probably the newly opened *Primula* garden, which I think I heard will be the largest collection on Earth. Responsible for it is Professor Kjell Ivar Flatberg. I also saw fantastic rock gardens in northern Norway, such as Magnar Aspaker's in Harstad, including the Botanical Garden in Tromsø—very impressive what they can grow there, including, surprisingly, several species from New Zealand and Chile." We hope to learn more about the gardens of Scandinavian NARGS members in the future and would welcome contributions from them.

Special thanks are due to Todd Boland of St. John's for coordinating contributions from members in his region for this issue, as well as for his own articles. Todd has contributed several articles to the *Quarterly* in the past and is working hard with his chapter to present the annual meeting and its associated tours.

Corrections: The plant illustrated on p. 204 of the Summer 2004 issue under the name *Campanula saxatilis* is correctly identified as *C. thessala*, according to photographer Maria Galletti. On p. 287 of the Fall 2004 issue, the two lower photos were reversed left to right.

Ericaceous Plants of Eastern Newfoundland

Todd Boland

Newfoundland's provincial anthem begins, "When sun rays crown thy pine-clad hills." Writing in 1902, the author was probably being optimistic when he penned this passage. Although pines do occur in small numbers in central and western Newfoundland, it is doubtful there were ever any pine-clad hills on the Avalon Peninsula, the easternmost portion of the Island of Newfoundland. Today its hills are covered by balsam fir (*Abies balsamea*), white spruce (*Picea glauca*), black spruce (*P. mariana*), eastern larch (*Larix decidua*), and a scattering of white birch (*Betula papyrifera*), or in many places, simply shrubby "barrens." The soils of the Avalon Peninsula are very shallow, derived from a mix of sandstone, siltstone, and granite, and hence acidic. Glaciation carried most of the soil away, dumping it about 200 miles offshore. In their wake the glaciers left numerous boulders called erratics, which still dot the countryside. Being the windiest and wettest portion of the Island, the Avalon is not hospitable to tall trees. The end results are somewhat stunted forests, windswept barrens, and in the valleys, many lakes and bogs. It's a wild, rugged landscape with a haunting beauty.

The peninsula's acidic soils are home to many plants of the family Ericaceae (the heath family), and these are the most conspicuous plants of our barrens and bogs. The island portion of Newfoundland is home to 40 species of ericaceous plants; if you include the Labrador portion of the province, the number rises to 44. (Note that the most recent botanical classification of plants now includes the former families Pyrolaceae and Empetraceae within the Ericaceae, which adds to the high number of ericaceous plants in this tally.)

One of the most common ericaceous shrubs on the Avalon is also one of our earliest bloomers, the rhodora, *Rhododendron canadense*. This shrub locally grows from 1 to 2 meters tall and is found throughout barrenland areas, as well as along the edges of bogs, lakes, and forests. Here, it blooms in late May to early June, just as the leaves begin to unfurl on most deciduous trees and shrubs (yes, spring is late to arrive here). There is a natural range in the color of the flowers from light orchid-pink to deep magenta. It is a garden-worthy subject, not only for its attractive flowers but also for its glaucous summer foliage, which colors attractively in fall. Our other native rhododendron is the evergreen Labrador

tea, *Rhododendron groenlandicum* (formerly in the genus *Ledum*). Also very common, this plant blooms in mid-late June with spherical white heads and beautiful rugose leaves covered in whitish tomentum (woolly coating). As the leaves mature, the upper tomentum is lost but the hairs on the underside turn rich cinnamon-brown. The foliage is very fragrant when rubbed. Various clones range in height from 20 cm to 1.2 m (8–45 inches).

Perhaps the most common ericaceous plant is sheep laurel, *Kalmia angustifolia*. Locally we call this plant “goowiddy,” and it’s the bane of hunters and fishers as they cross barrenland and peatland areas. Very numerous, it grows just about anywhere. The countryside often takes on a pink tint when its flowering peaks around mid-July. Although quite beautiful, the plants sucker terribly and thus are rarely seen in gardens. Much more tame and garden-worthy is its smaller cousin, the bog laurel, *Kalmia polifolia*. This plant prefers wet haunts but adapts to drier garden situations. Generally under 30 cm, it can be a welcome addition in beds devoted to acid-loving plants. The bright pink blooms are produced locally in early-mid June. The Memorial University Botanical Gardens in St. John’s is fortunate to have the rare white form of this species.

Another plant that looks superficially like bog laurel, at least when it’s not in bloom, is bog rosemary, *Andromeda polifolia* var. *glaucophylla*. It too has narrow, evergreen foliage on a low, bushy plant, but its leaves are a lovely blue-green to gray-green. It blooms at the same time as the bog laurel, but with nodding terminal clusters of pale pink, urn-shaped flowers.

Another common evergreen shrub of barrens and peatlands is leatherleaf, *Chamaedaphne calyculata*. Though not a floral knockout, it is one of the earliest native plants to bloom, in early to mid-May. The nodding cream-white flowers are produced in small clusters on the ends of the stems. Selection has resulted in a lovely dwarf form which is growing in the St. John’s local botanical garden.

Economically, the most important local ericaceous plants are members of the genus *Vaccinium*. We are fortunate to have several species, all of which produce delicious berries sought by pickers in late August to early October. The most common species is the lowbush sweet blueberry, *Vaccinium angustifolium*. While much lower-growing than the more southern highbush blueberry, it has much sweeter fruit (not meaning to brag!). Mostly under 50 cm (20 inches) tall, it makes a good garden plant in the right setting. After you harvest the fruit, you will be rewarded with spectacular scarlet fall foliage. Quite rare on the Avalon Peninsula is the smaller cousin of the lowbush blueberry, the northern blueberry, *V. boreale*, which looks generally like a miniature version of the lowbush. Growing to only 10 cm (4 inches), it’s perfectly suited to a rock garden setting.

Another Newfoundland delicacy is the fruit of the rock cranberry, *Vaccinium vitis-idaea* (photo, p. 18). Locally we call it partridgeberry, not to be confused with the partridgeberry of eastern North America, *Mitchella repens*, a member of the honeysuckle family and not edible. Our partridgeberry grows throughout northern Europe, where English speakers call it lingonberry, and in Alaska under the name lowbush cranberry. In its range in Europe this species grows to about 50 cm, but our local population rarely exceeds 10 cm and is often called *V. vitis-*

idaea var. *minus*. It is a wonderful rock garden subject with glossy evergreen leaves that turn burgundy-red in winter. Throughout June, plants produce small clusters of pink, urn-shaped flowers that develop into shiny red fruit come September or October. The berries are popular locally in jam, pies, and muffins.

The true cranberry, *Vaccinium macrocarpon*, may be found growing along wet coastal hillsides of the Avalon Peninsula. Its smaller cousin, *V. oxycoccos* (photo, p. 17), is more common, being present in nearly all peatland communities. Both produce pink flowers reminiscent of *Dodecatheon* in July, followed by tart red berries in October. Neither is very easy in typical garden situations. However, our last native *Vaccinium* is another excellent rock garden subject. The alpine bilberry, *V. uliginosum*, forms a prostrate mat of glaucous, round leaves that turn yellow in autumn. The small, whitish, urn-shaped flowers of June are followed by small blue berries in August. They taste similar to the standard commercial blueberry. This species is commonly found atop the higher windswept hills of the Avalon Peninsula.

On the most exposed hilltops, you can find two less common members of the heath family: the alpine azalea, *Loiseleuria procumbens* (photo, p. 18), and alpine bearberry, *Arctous alpina* (formerly *Arctostaphylos alpina*; photo, p. 17). Both can be attractive rock garden plants—the former for its flowers, the latter for its foliage. The alpine azalea has very small leaves and tiny pink flowers in early June. It can be challenging to grow in the garden but is well worth the effort for its exquisite flowers. The alpine bearberry produces whitish-green, urn-shaped flowers in early June, followed by dark red berries in October. However, its selling features are the glossy, metallic sheen of the leaves in summer followed by their brilliant burgundy and scarlet in autumn.

Another ericaceous shrub with excellent fall color is the dwarf huckleberry, *Gaylussacia dumosa*. This is another shrub small enough to be useful in the garden. Usually under 50 cm, it has lovely bright green, somewhat shiny leaves in summer followed by bright red fall foliage. The nodding clusters of white, urn-shaped flowers in July are large enough to put on a reasonable display.

Perhaps the lowest-growing ericaceous plant of eastern Newfoundland is the creeping wintergreen, *Gaultheria hispidula*. Common in most woodland situations, it can also be encountered in open sunny barrens and even in drier bogs. The flowers are inconspicuous, to say the least, but the white, egg-shaped berries of August and September are rather cute. This species makes a nice groundcover in a woodland garden.

The last “traditional” ericaceous plant growing locally in my area is heather, *Calluna vulgaris*. This British plant was introduced near Whitbourne, Newfoundland, and has now spread for many miles away from that community. There is also a population growing atop Signal Hill in St. John’s. As time goes by, heather may become a more conspicuous part of our local ericaceous flora.

The other ericaceous plants that grow locally are former members of other families, primarily the Empetraceae and Pyrolaceae. Black crowberry, *Empetrum nigrum* (photo, p. 17), is abundant in most habitats except dense forest. The heathlike foliage forms a prostrate mat. The flowers are produced in April, mak-

ing this species the very earliest native wildflower to bloom; however, they are inconspicuous. By July and August, the jet-black berries appear. The much rarer pink crowberry, *E. eamesii*, is found atop the highest hills, usually growing with alpine azalea, northern blueberry, and alpine bearberry. It looks essentially like black crowberry except that the fruits mature from light pink to translucent red.

The native pyrolas are mostly forest dwellers with the exception of the showiest species, *Pyrola americana* (formerly *P. rotundifolia*). This species has the largest blooms and produces a spike of white, bell-shaped flowers in July. It is not very common but is regularly encountered in boggy conditions. The one-sided pyrola, *Orthilia secunda* (formerly *P. secunda*), and the small pyrola, *P. minor*, are common in woodlands. Shinleaf, *P. elliptica*, and green pyrola, *P. chlorantha*, are quite rare woodland species on the Avalon Peninsula. The one-flowered wintergreen, *Moneses uniflora*, is a common woodland plant with relatively large white, nodding flowers on 5–10 cm stems in July. It can be a wonderful subject for the woodland garden. The last two members of the local Ericaceae are both saprophytes which grow in dense shade: the Indian pipe, *Monotropa uniflora*, and pinesap, *Hypopitys monotropa*. The former is common on the Avalon, and the latter quite rare. Neither is likely to survive if introduced in the garden because of their dependence on specific soil microorganisms.

Another special alpine plant of the highest hills of the Avalon is *Diapensia lapponica* (photo, p. 18). It grows in association with alpine azalea, pink crowberry, and alpine bearberry. Although not ericaceous (its family is the Diapensiaceae), it shares some similarities in both habitat preference and superficial appearance. *Diapensia* forms hard hummocks of congested deep green leaves. Old leaves are retained within the cushion and actually assist the plant in warming up in the spring. Most bloom in early June with nearly stemless white flowers. Strangely, in Newfoundland we also have an August-blooming population. The June-flowering and August-flowering populations do not interbreed and with time will probably form two distinct species. Neither type is easy in cultivation because the solar heating mechanism, so useful on cold, exposed hilltops, can cause the plants to “burn up” when growing at warmer, lower elevations.

There is no doubt that the Ericaceae form a prominent feature of the Newfoundland countryside. The field trips planned for the NARGS Annual Meeting this July 14 through 17 in St. John’s will feature many of the plants mentioned in this article. Our local botanical garden also hosts many native ericaceous plants, allowing you to see how they do under garden situations. We will also see many other native plants, many of which make delightful rock garden subjects. I hope you’ll consider joining us this July. Newfoundland really is “The Rock Garden of the North Atlantic”!

Todd Boland is an instructor in general horticulture at a college in St. John’s, Newfoundland. He has been developing his present garden for 20 years and is also a dedicated birder. His special garden interests are conifers and ericaceous plants.

Arctic-Alpine Willows of Newfoundland and Labrador

Maria Galletti

The provinces of Newfoundland and Labrador together boast 33 native willows (*Salix* spp.); three grow only in Labrador, while ten are recorded in Newfoundland alone. What I find fascinating, and what draws me there time and again, is the region's great diversity of arctic-alpine willows. Newfoundland's geographic location, its climate, and its diverse and distinct topography make it a treasure trove for these and other great alpine plants. Unlike the tree or shrub species of the genus *Salix*, which prefer moist conditions in bogs or wetlands, these willows prefer dry, exposed sites. They are found mostly on the West Coast and the Great Northern Peninsula of insular Newfoundland, where there is a confluence of unique geological formations and landscape characteristics; in the Long Mountain Range, which stretches the length of the peninsula and is the northernmost extension of the Appalachian Mountains, with the highest peak being the Lewis Hills and the second highest, Gros Morne Mountain; on wind-swept coastal headlands, notably the Pointe Riche Peninsula; on moonscape limestone barrens such as Cape Norman; and on several serpentine areas, most famously the Tablelands of Gros Morne National Park. One can often view many of these willows growing by roadsides.

Within the arctic-alpine species there is considerable variation. They hybridize readily and can often be difficult to identify either as a species or a hybrid. These apparent similarities, as in the case of *S. arctica*, *S. cordifolia*, *S. glauca*, and *S. arctophila*, create some confusion; surprisingly, however, I have often observed at least six different species growing almost side by side at a single site, without any evidence of hybridization.

Several of these arctic-alpine species are rare, a few are considered endemic, and many are lime-lovers, often seen in calcareous barrens. Some, such as *Salix reticulata*, *S. vestita*, *S. arctica*, and *S. uva-ursi*, are widespread and often grow in diverse habitats. Though they all deserve to be mentioned for their individual characteristics and unique qualities, I will concentrate on the particular species I have discovered and observed on my numerous trips to Newfoundland and Labrador, and specifically those I have propagated and cultivated.

The most common, and my favorite, is *Salix vestita*, also known as the Rock Willow or Roundleaf Willow, an upright miniature with a thick, gnarled trunk and branchlets (photo, p. 19). Its leaves are highly textured, similar to *S. reticulata*, but with undersides coated with dense, white, silky down. Its most remarkable feature is its distinct flower-bud hues, which range from vivid red to flaming orange to muted yellow. It is found in limestone barrens and poor gravelly soils, often in close proximity to *Cypripedium pubescens* f. *planipetalum*, the exquisite dwarf yellow lady's slipper found throughout western Newfoundland, usually peering through low coniferous and grassy thickets. Normally no more than 15 cm (6 inches) high, *S. vestita* can reach 40 cm (14 inches) in more protected, moist sites. On my last trip I was fortunate to see a fastigiated form.

Salix reticulata (photo, p. 19), one of the better-known arctic-alpine willows, is closely related to *S. vestita* yet quite different in habit and often found in dissimilar habitats. *S. reticulata* is mat-forming, with trailing stems and leaves that are glossy and heavily impressed with venation. Highly variable in form and leaf shape, the Net-vein Willow is found growing in moist yet exposed calcareous sites in soils with a substantial peaty base, often in close proximity to *Diapensia lapponica*, *Betula pumila*, *Saxifraga oppositifolia*, the miniature *Primula laurentiana*, or *P. egalikensis*.

In Labrador I have seen *S. reticulata* growing in boreal conditions. Forms vary from the tiniest pads of round or pointed revolute leaves to more robust forms with large oval or circular leaves. The catkins are purplish-brown and slender, growing on top of the previous year's shoots. In my garden I grow various forms from Newfoundland and one from Alaska. There is a definite distinction between the plants, the Alaskan form being more vigorous and robust.

While several of these arctic-alpine willows are widespread throughout Newfoundland and Labrador, there are a few rare ones, including *Salix jejuna*, the Barrens Willow, *Salix herbacea*, the Snowbed Willow, and *Salix calcicola*. *Salix jejuna* (photo, p. 20) is not only rare but also an endemic of western Newfoundland, found in only a handful of sites, notably in the Cape Norman calcareous barrens and Strait of Belle Isle. I was able to locate it only after several trips, but what a find! This jewel of a shrub forms small mats where its red-brown stems root as they crawl and secondary branchlets often shoot up from underground; it is characterized by diminutive spoon-shaped leaves, which are lustrous with distinct venation. On my most recent trip, in late August 2004, I found not only some plants in bloom, but also some with distinctly recurved leaves that almost seemed variegated. Because of its rarity, this willow is now a protected species.

Salix herbacea (photo, p. 21) is rare because it has a distinct habitat. It is called the Snowbed Willow because it grows on mountaintops under late snowbeds. This enchanting herbaceous willow is distinguished by its round leaves with crenation or teeth on their margins. Stoloniferous in habit, it branches from underground with only the tops of the branchlets surfacing. The catkins are tiny and colorful, borne on the tips of new shoots. This particular willow has eluded me, though I have climbed all the high mountains in the Western Peninsula. This

leaves me yet to explore Labrador's Mealy Mountains and Brigg Island near Emily's Harbour. However, my hunch is that I have a much better chance of finding it on Mt. Washington in New Hampshire.

Salix calcicola, the Limestone Willow, is much more accessible, inhabiting limestone barrens and coastal headlands such as the Pointe Riche Peninsula. A subspecies of *S. lanata*, it is quite variable in stature. In wet, stony areas it is an upright shrub forming small thickets, but in harsh habitats it is extremely ground-hugging. Its characteristic qualities are the fleecy juvenile leaves and the large candle-like catkins. Like *S. jejuna* it is an early bloomer, and by late August to early September most of the seed has dispersed.

Salix arctica, widely variable, is one of the few arctic-alpine willows found on serpentine areas and mountaintops, a habitat also preferred by *S. arctophila*. *S. arctica* is a prostrate shrub with somewhat ascending or aerial branchlets, robust catkins, and large variable leaves, gray-green and hairy when young, turning leathery at maturity.

In contrast, the Bearberry Willow, *Salix uva-ursi* (photo, p. 20), forms mostly flat compact mats with shiny, tiny, pointed, mouse-ear-like leaves. It is less variable than *S. arctica*, easily recognized by its slender, pointed leaves and reddish-purple, slender catkins. Found throughout Newfoundland and Labrador, it is indiscriminating in its choice of habitats, which include exposed wet or dry rocks, calcareous sites, coastal areas, mountaintops, and snowbeds. It's a favorite of mine for its miniature stature and perky silhouette.

Salix candida, otherwise known as the Hoary or Sageleaf Willow, is not one of the refined arctic-alpines, but its starved miniature forms are quite fetching. Common throughout the Great Western Peninsula and Labrador on exposed dry or wet sites and on limestone barrens, it often can be seen growing by the roadside. This willow can reach up to 3 meters (10 feet), though I have seldom come across such large specimens. It is a willow that can easily be spotted, since the whole shrub has a white downy texture, from the white fleeciness of the leaves to the gray shades of the trunk and branches.

I propagate arctic-alpine willows mostly from cuttings, the easiest method with fast results and sure identification of species. Propagating from seed is limiting because fresh fertile seed (see below) is required. I usually take cuttings early or late in the season before leaf emergence or after leaves have fallen. Semi-woody cuttings work best, though with *Salix vestita* younger cuttings root better. For my rooting medium I use equal parts of sifted, well-composted bark and fine perlite. I provide moisture and some heat.

I also like to propagate willows from seed. It is exciting to grow on the little seedlings of these fine dwarf shrubs and observe the degree of variation among them. When I am collecting seeds and cuttings from the wild it is usually quite late in the season, which means time is limited for strong growth. To safeguard my collection I follow this procedure: I strike (place in the rooting medium) half my cuttings for immediate rooting, and put the other half in the refrigerator wrapped in sphagnum moss and placed in a sealable plastic bag. In January, after they have undergone a dormancy period, I strike them as well. I find I have a bet-

ter success rate combining the two rooting techniques. I follow the same rule with seeds. I sow half the seed upon my return, and as a safeguard I put the other half in slightly moistened vermiculite in a sealable plastic bag and place it in the refrigerator. In January or February I sow the second batch of seed. Germination is often good from both sowings, but there is always a certain amount of loss from damping off in the seedlings from the first sowing.

Arctic-alpine willows are great for the small rock garden, crevices, raised beds, or troughs. For the rock gardener, their ground-hugging habit, unique and varied flowers and fruits, distinct and attractive leaf shapes, and ethereal textures make them an essential addition to the garden. They prefer an open site with plenty of air movement, which is what they are used to in nature. The soil should be moisture-retentive yet well drained. In areas where summers are very hot, a northern exposure or some afternoon shade is advisable. A dusting of limestone in the soil for the lime-lovers is desirable, although in my experience the calci-philes can tolerate some soil acidity. An occasional feeding of bone meal or any other slow-release fertilizer is sufficient.

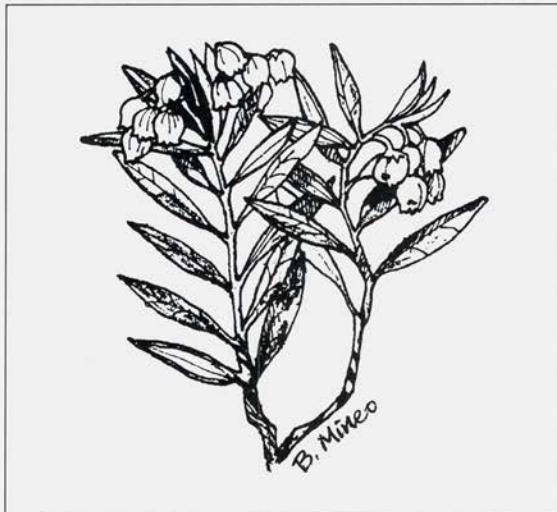
Maria Galletti is the owner of Alpines Mont Echo (see advertisement in this issue). She travels widely in search of plants, and gardens and propagates at her specialty nursery in the mountains of Sutton, Quebec, Canada.

Resources

<http://nfmuseum.com/flora.htm>

<http://www.nfalpines.homestead.com/index.html>

<http://www.mun.ca/biology/delta/arcticf/sal/index.htm>



Andromeda polifolia 'Nana', drawing by Baldassare Mineo

Southern Alpines in St. John's

Bodil Larsen

My house in St. John's, Newfoundland, was a year old when I bought it in December 1976. The property was covered in snow at the time, and, not surprisingly, when the snow melted it became clear that the previous owner had made no attempt to create a garden out of what had been spruce and fir forest. Behind the house was an east-southeast facing bare slope, and that is where a rock garden began quite suddenly to appear when a friend gave me ten spare rock plants.

In those days the local nurseries did not carry rock garden plants, so the only sources were seed exchanges, mail order nurseries, and the plant sale of the Friends of the (Botanical) Garden (FOG). The first "southern alpine" that I acquired was *Helichrysum milfordiae* from a FOG sale; that was in 1982, and it is still with me. I think my experience with this plant is similar to that of other growers; it creeps about slowly, contouring the stones around it with its soft, hairy, gray foliage and leaving behind the dying older parts of the plant. Trying to tidy it up by cutting away the dying parts always results in pulling out healthy pieces, so now I only remove the minimum amount of dead stems, leaving the plant looking somewhat less than perfect. To protect it from winter wet, I cover this hairy South African from November to late April with a wire basket, the type used in home freezers, covered on the long sides by a sheet of heavy plastic. Our winters can feature anything between good snow cover from late November to mid-April to the other extreme of continuous fluctuation between snow and rain. In a "long season" year, the last frost is in April and first frost in October; in a "short season" year, last frost is in June and first in September. Temperatures in July are seldom above 24°C (72°F), and even on hot days we almost always have some wind. True, the past two summers we have had several days when the temperature neared 30°C (86°F). Winter temperatures are rarely below -10°C (14°F), but we can have very strong winter winds.

In the 1970s and 1980s, Alpenglow Gardens, a nursery in British Columbia on Canada's west coast, was an excellent source of rock garden plants. Among the "southerners" from Alpenglow that are still with me are two little trees, *Podocarpus nivalis* and *Athrotaxis cupressoides*. Both are evergreens; the *Podocarpus* grows

as a groundcover rather than as a small tree as it does in New Zealand. It does flower but needs a mate in order to produce fruit. The *Athrotaxis*, in its native Tasmania, would be a tall tree, in my garden it has grown very little and that suits me just fine.

My first attempt at growing *Rhodohypoxis baurii*, a South African bulb, was not successful. I think the spot where I planted them was too dry; they did not survive their first winter. I brought back two cultivars of it, 'Margaret Rose' and 'Garnet', when I attended a Scottish Rock Garden Club meeting in Edinburgh in 1990, and these plants have multiplied nicely. They are growing on the east side of a large stone in the main garden. In the first years I dug the corms up and kept them in the refrigerator during the winter. I discovered that the corms I had accidentally left behind survived the winter, so now I leave the majority of the corms in the ground. Eventually I hope to have this little summer-blooming plant form the ground cover under a Japanese maple.

A member of the staff at our local botanical garden spent some time at the "Botanics" in Edinburgh (in the days of assistant curator Alf Evans) and brought cuttings of various plants back with her. They were propagated and planted in the garden, with excess plants sold at FOG sales. I bought two of these in 1983: *Hebe lycopodioides*, a whipcord hebe, and *Hebe epacridea*. The latter flowers every year; the former has never flowered but is a very statuesque plant. *H. epacridea* sends out branches that lie on the ground. As the branches grow at the tips, the older leaves further back die, and now, after 21 years, the plant looks rather untidy and should probably be replaced. Since the seeds germinate well, that should not be too difficult. Another white-flowered New Zealand hebe in the garden is *Hebe pinguifolia*. It was started from exchange seed from the cultivar 'Pagei' in 1981 and is still going strong; it flowers regularly.

Another New Zealand plant that has been with me for a long time is *Parahebe lyallii*, started from seed. I have tried other parahebes, but this is the only one that has survived more than a couple of years, probably because it has been placed in a slightly moister spot. Its neighbor is the white-flowered *Oxalis magellanica*, which also likes some moisture. I tried that oxalis from seed several times but could never get it going; the plant I have now was bought in 1999 and is doing almost too well.

I first visited South America in 1985 and have since returned several times. Each visit resulted in a variety of seeds to be tried. Some of the plants that are still with me, grown from seed collected in February 1989, are *Berberis empetrifolia*, collected in Tierra del Fuego, and *Azorella trifurcata* and an *Armeria* species collected on Cerro Catedral, near Bariloche in Argentina. The berberis is covered in yellow flowers in June and black berries later in the year. It has stayed fairly short, about a foot high, but it spreads more than I like and consequently is cut back every year. From seed, also collected on Cerro Catedral, I got *Nassauvia argyrophylla* (I think) going (photo, p. 22). It stayed with me for three or four years but was eventually crowded out by the berberis. It did flower but did not set viable seed. This is one of the larger *Nassauvia* species, about 10 inches (25 cm) tall.

A plant that I fell in love with on that first visit to Cerro Catedral was *Oreopolus glacialis*. Below the cable car, the ground was yellow with the flowers of this plant. Walking down from the mountain, I collected seeds from it, and they germinated well, but I made the mistake of planting them out in the garden in the fall rather than keeping them indoors the first winter. This little plant with tubular flowers is one that I would dearly like to try again; I think it would do well here.

In 1991 I was back in Chile and Argentina, and that trip also resulted in quite a number of different seeds to be tried. *Loasa nana* (photo, p. 21) germinated and flowered, but did not set seed and did not survive its second winter. This is such a weird-looking plant; light green, stiff, ferny, curled leaves and strange 5-petaled yellow flowers with white centers. The whole plant is only about 3 inches (7.5 cm) high. I would like to try it again if seed were available but my gut feeling is that I would not be able to make it survive our winters. From 1991-collected seed I tried four different species of *Ourisia*—*O. alpina*, *O. brevifolia*, *O. microphylla*, and *O. racemosa*—but none of the plants survived. *Calandrinia*, seven different species, did not do well either. Several of the *Calceolaria* species have done well. I let them self-seed and I am not really sure what species I am growing now. I do know that neither *C. arachnoidea* nor *C. cana*, both with velvety leaves, survive our winter, not even when covered with an inverted ice-cream container from November to May. *C. polyrrhiza* and *C. lagunae-blancae* (p. 22) survived and flowered at least three years.

Also collected in 1991 were seeds of *Oxalis adenophylla*, *O. erythrorhiza*, and *Ranunculus semiverticillatus*. The ranunculus germinated and survived in the pot outdoors for two winters. The third summer the roots were coming out the bottom of the pot and I made the mistake of planting them—there were three plants in the pot—in the garden and then going on vacation. Whether it was slugs or lack of water that got them I do not know, but they were not to be found when I came back three weeks later. The *Oxalis adenophylla* seed germinated and the plants have survived and gently self-seed. But my pride and joy was *Oxalis erythrorhiza* (photo, p. 22). A few seeds germinated, two small plants were planted out in the garden, and one survived there for more than 10 years. It grew to about a foot (30 cm) across and flowered each year, maybe 8 or 10 stemless yellow flowers at a time. It did not set seed; at least I did not find any. The cushion was softer than it is in the wild. Eventually the ants moved in under it and I suppose the tunnels and chambers in the soil dried out the plant. The last couple of years I had to cut out branchlets, and finally in 2003 the whole plant was dead.

The final plant I would like to mention is the shrubby violet *Viola fluehmannii* (the picture in the *AGS Encyclopedia of Alpines* is not of *V. fluehmannii*). We saw this growing at the tree line in *Araucaria* (monkey puzzle tree) forest in Chile. This was a very special place to me! To look at the ridge of the mountain and see the outline of *Araucaria* against the sky gave such an “I don’t believe it” feeling. In the shrubby undergrowth grew a plant about a foot high which to my northern eyes looked like a heather. But when I took a closer look, I saw that the flowers were violets! I collected a few seeds and one germinated that spring. Again I

made the mistake of planting it out in the garden too early and it did not survive the winter, but this is a plant that I think would do well here if I could only get it going. I have a coldframe now, so if there is a “next time” I can give it a more protected winter.

Yes, there are southern alpines that I will never be able to grow in my garden, such as *Chaetanthera spathulifolia* with a velvety soft cushion that just begs to be stroked, and a large yellow daisy flower; but there are others, such as *Viola fluehmannii* and *Oreopolus glacialis*, that I think would be happy here. And while I wait to get seed of them again I will enjoy the other southerners that have made themselves at home here in St. John's.

Bodil Larsen came to Canada as a postdoctoral fellow in immunology in 1973. She now gardens just outside St. John's, Newfoundland.



Calceolaria uniflora, drawing by Baldassare Mineo

Growing Small Bulbs in Newfoundland

Howard Clase

My earliest memories of bulbs are seeing a woodland floor carpeted with hardy cyclamen in a Wiltshire country house grounds and, a year or two later, discovering the lawns of St. James' Park in London dotted with blue crocuses one October. These memories came to me when, many years later, I had a garden of my own and came across a catalogue offering fall-flowering bulbs, so I decided to order a few to try out. They came up, and I was hooked. Since then I have tried dozens of species and varieties—many of them fall-flowering—and have learned by trial and error (lots of that) what will and what won't grow here.

Newfoundland is, on the face of it, not good bulb-growing territory. Most familiar garden bulbs evolved in response to a Mediterranean climate with cool, wet winters and warm, dry summers; the first requirement we can manage only too well, but the second is not a noticeable feature of the St. John's climate. The native flora also supports this view: as far as I am aware, none of its thousand or so species has a summer dormancy period. Another problem we face is the shortness of the season: winter snow may last until early May, and the tree leaves do not usually appear until the first week of June. Lately, though, we have experienced mild falls, with the first real frost in late October or early November.

The trick is to look at conditions where the bulbs originate and pick those that don't need a summer baking. I have acquired books on bulbs and specialists' catalogues which contain useful information; the Internet helps a lot too. It's also worth taking the occasional gamble. It's surprising how many bulbs haven't read the books! One way and another, I have managed to find enough tolerant small bulbs to fill the gardening year with their flowers, and for bulbs the gardening year is pretty well all 12 months. (In this article I use "bulb" in its broad sense, including corms, tubers, and even moderately thick rhizomes.)

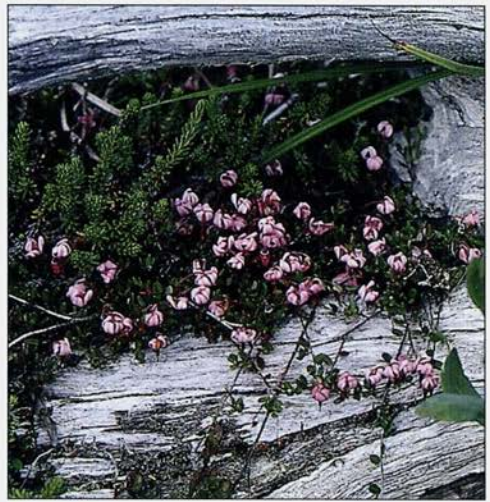
Fall

The bulb year begins when the autumn rains wake them from their summer dormancy and they start putting out their roots. Those most familiar to gen-

eral gardeners leave it at that and wait until spring before venturing above ground, but there are some hardy—some might say foolhardy—species that start flowering right away, generally leaving the foliage until later. One point in favor of fall-flowering bulbs is that the days are getting cooler all the time, so the flowers often last longer than their spring cousins. These are still my main love; so, while most local gardeners are putting their gardens to bed for the winter, I'm looking for the signs that mine is waking up: the pale tips of crocus and colchicum flowers, or the loop of stem from a cyclamen, with the mystery of whether it will finally bring up a leaf or a flower-bud. And it is mostly these three C's that add to the interest of our garden during the fall.

The earliest to appear is *Cyclamen purpurascens* (photo, p. 25; see also p. 56), which puts up its first flowers in late July and can last until October. This is one of four cyclamen species that will survive outside here given the right site and soil and the only one that seems to seed naturally, often carried by ants some way from the parent plant. *Cyclamen hederifolium*, in pink and white forms, grows well and doesn't seem to mind having its attractively marbled leaves covered in snow for several months, but the seedlings rarely survive their first winter outside. *Cyclamen cilicium* needs a very sheltered spot outside but does well in a pot with a little protection. The fourth, *Cyclamen coum*, really belongs in the winter section. The main problem with these species here has not been the weather but the vine weevils, whose grubs eat the roots and cause the tubers to rot.

The most successful group are the colchicums. I have tried about a dozen of the most readily available species and cultivars, and all do well except *Colchicum cilicium* and the pink double "Waterlily" hybrid of *C. autumnale*, which are so late-flowering that they are overtaken by winter. However, given good soil, they all grow well and multiply in our climate, doubling or tripling the number of corms each year. The flowers appear from mid-September and last until mid-November. My favorites are *Colchicum speciosum* in all its forms, but particularly the wonderful goblet-shaped cultivar 'Album' (photo, p. 24) that has captivated everyone who has grown it from E.A. Bowles on. The waxy, deep-lilac flowers of 'Lilac Wonder' are so lovely that I forgive their tendency to collapse after a day or two. *Colchicum byzantinum*, known in gardens since 1588, is probably a cultivar or hybrid of *C. cilicium*; it has sturdy, nicely shaped pinkish-lilac flowers in great profusion, but excels all others in the size of its leaves. The wild "meadow saffron" of England, *Colchicum autumnale*, is similar but less attractive, with paddle-shaped petals that open too wide, but it has given rise to a number of better cultivars: the white single, 'Album' with its small crocus-shaped flowers looks lovely en masse, and the white double 'Alboplenum' (photo, p. 24) flowers just in time to avoid the weather that demolishes 'Waterlily'. Colchicums are alpine meadow plants and few are suitable for any but the largest rock garden, mainly because of the size of their leaves in spring. One exception is *Colchicum xagripinum*, a small star-shaped flower with tessellated white and deep-lilac petals and ground-hugging, wavy gray-green leaves. I have never seen this offered commercially in Canada, and it is always expensive in UK catalogues—but I don't know why, since it increases as fast as any. Colchicums are often called "fall cro-



Ericaceous plants of Newfoundland (p. 3): above, *Empetrum nigrum* and *Vaccinium oxycoccus*; below, colorful *Arctous alpina*. (Photos, Todd Boland)





This tiny form of the lingonberry, *Vaccinium vitis-idaea*, is sometimes called variety *minus* (p. 4).
(T. Boland)

Diapensia lapponica (p. 6); *Loiseleuria procumbens* (p. 5).





Some dwarf willows of eastern Canada (p. 7): above left, *Salix glauca*; above right, *S. vestita*; below, *S. reticulata* intermingled with *Saxifraga oppositifolia* (p. 8). (Photos, Maria Galletti)





Salix jejunata (p. 8) in flower. (M. Galletti)

Salix uva-ursi (p. 9) forms a dense mat.





Salix herbacea (p. 8) and lichened rocks. (T. Boland)

Loasa nana from dry Andean screes found a home in Bodil Larsen's Newfoundland garden (p. 13). (B. Larsen)





Alpines from the southern Andes growing outdoors in Newfoundland (p. 11): above left, *Calceolaria lagunae-blancae*; above right, *Oxalis erythrorhiza*; below left, *Nassauvia argrophylla*. (B. Larsen)

Below right, *Lychnis alpina*, a native of Newfoundland. (T. Boland)





Saxifrages native to Newfoundland (p. 37): above, *Saxifraga paniculata* subsp. *labradorica*; below left, *S. aizoides*; below right, *S. cernua* showing its distinctive bulbils. (Photos, T. Boland)





Even near the North Atlantic, fall bulbs bring a flowering farewell to the season. Above, *Colchicum speciosum* 'Album' received a Photo Contest award for Jon Evans (p. 65). Below, Howard Clase's bulb garden in Newfoundland (p. 15) includes *Colchicum autumnale* 'Alboplenum' and *Cyclamen mirabile*. (H. Clase)





Spring in the Newfoundland bulb garden includes these two striking crocuses, *Crocus corsicus* (left) and *C. minimus* (right; p. 35). (H. Clase)

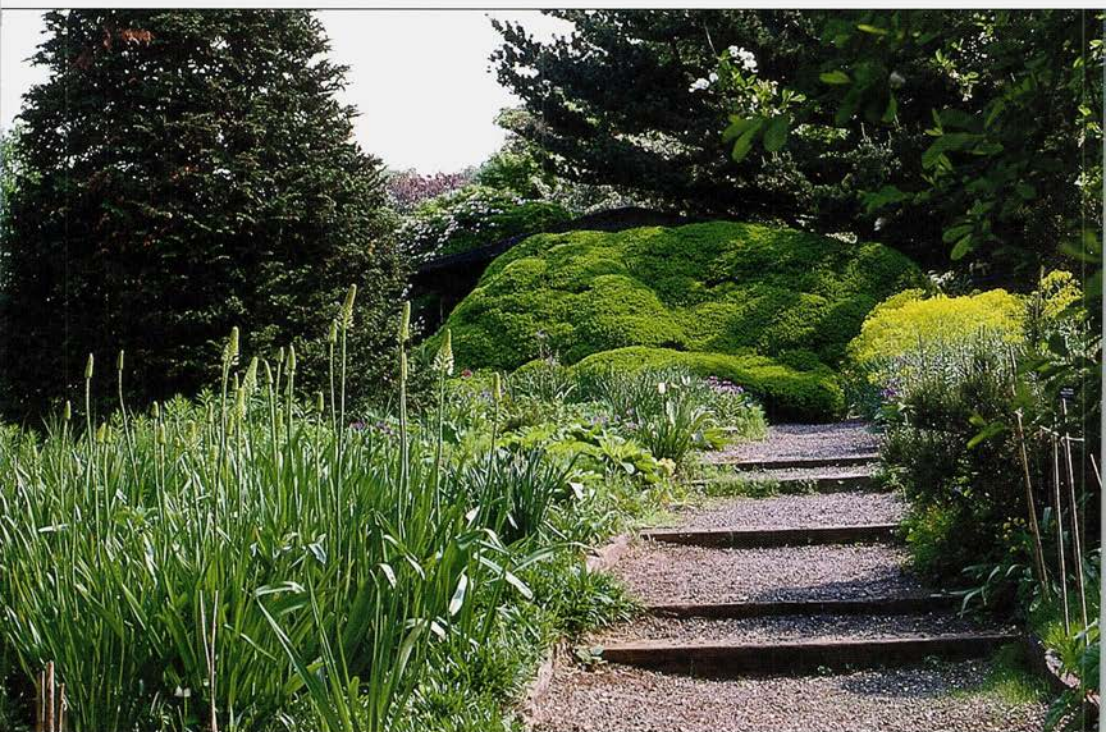
Cyclamen purpurascens (p. 56) is well suited to northern gardens, here in Illinois. (G. Firak)





The dry garden at Wave Hill, Bronx, New York (p. 46). (L. L. Horwitz)

Wave Hill's wild garden.





Iris setosa subsp. *canadensis* (p. 58) at Cape Freels, Newfoundland. (T. Boland)

A split boulder planted with *Androsace*, *Lewisia*, and other subjects in the garden of David Sellars (p. 50). (D. Sellars)





Two views of the new rock garden at Truro, Nova Scotia (p. 40). The paved area, destined for a trough display, was constructed with a grant from NARGS. (Bernard Jackson)





Prize-winning photos in the 2004 contest by the late Dick Redfield; a memorial article on him appears on p. 68. Above, *Adonis vernalis*, second, class 3; below, Cottrell garden, Christchurch, New Zealand, first, class 4.



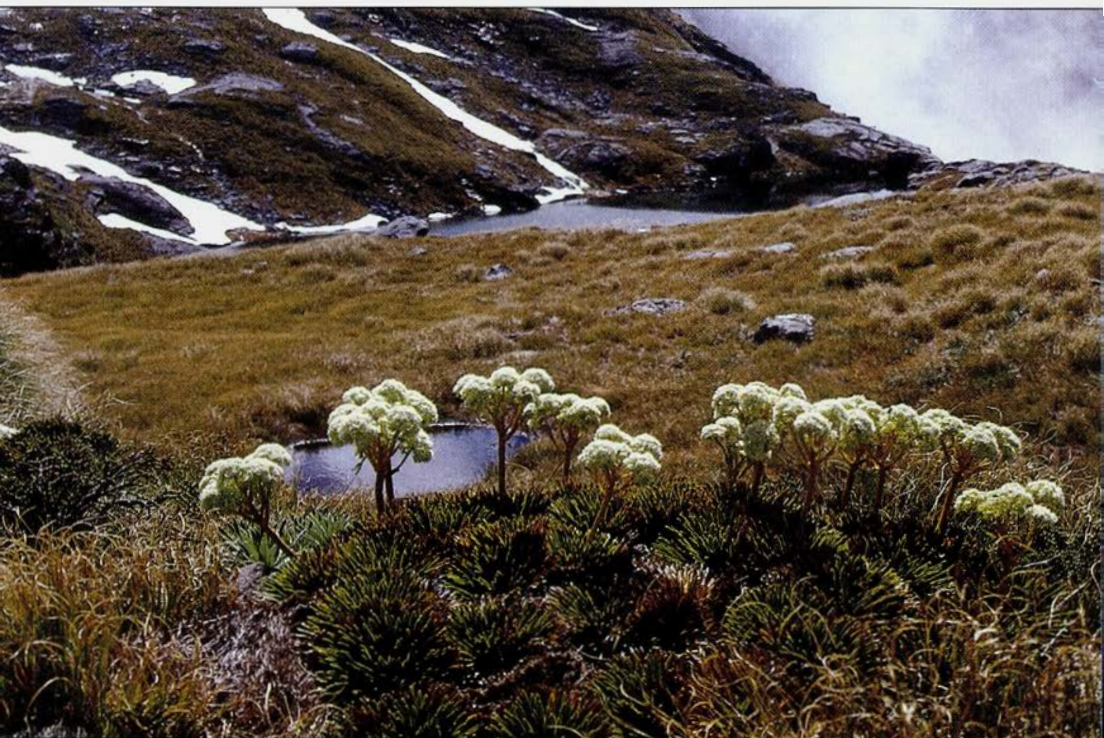


Award-winning images from the 2004 photo contest. Above, Doris Taggart, Kirkland, Washington, photographed *Leucogenes grandiceps* in South Island, New Zealand, for first prize in class 1. Below, David Sellars of Surrey, B.C., received first in class 2 for this photo of *Trollius europaeus* in the Dolomites.





Two alpine meadows, two hemispheres. Yoko Arakawa photographed this meadow with *Castilleja miniata* in flower in Colorado, honorable mention, class 2. Below, Doris Taggart's photo of *Aciphylla congesta* in New Zealand received fourth in class 2.





Dick Redfield (p. 68) traveled the world to capture vivid images of alpine plants. Here, *Campanula piperi* in the Olympic Mountains, Washington, which received honorable mention in class 1.

cus,” despite the six stamens that show their closer relation to lilies than to the iris family to which crocus belongs; since the Liliaceae has been split up, these bulbs now belong to the Colchicaceae.

There are, of course, true fall-flowering crocuses; about a third of the approximately 70 species of crocus flower before or during winter. In Newfoundland the story is similar to that for cyclamen—only a few species can cope with our climate outdoors. The dark-veined, blue-flowered *Crocus speciosus*, the one most commonly sold, is tough enough to flower until Christmas, and paler *Crocus pulchellus* seems equally hardy. Until recently I had only known the latter as its cultivar ‘Zephyr’, which gives delicately veined, pale dove-gray flowers from mid-October until early December and like *C. speciosus* increases well. I recently acquired typical *C. pulchellus* and the form ‘Albus’, which both seem to be doing as well. *Crocus nudiflorus* has an interesting history, with long-established colonies in England even though it originates on the France-Spain border. It is thought that it was used as a source of saffron by the medieval Knights of St. John and escaped from their physic gardens. The fact that it has persisted so long is a testament to its hardiness in English conditions, and it seems to do just as well in Newfoundland. It is the only autumn-flowering species that I have been able to establish in grass, and it seems to thrive there as long as the leaves are not mowed too early. Two corms purchased in 1978 have increased to a couple of hundred flowers in various parts of our garden. It is unusual for a crocus in that it puts out stolons, and new corms can form from these several inches away from the original. But it’s the kind of weed no one objects to, giving large purple flowers with contrasting yellow styles and anthers on slender but sturdy tubes from late September to early November. We have taken tweezers and gathered the styles for saffron, but they are much shorter than those of the true Saffron Crocus, *C. sativus*. I have tried to grow that too, but it needs a better climate. There is a fall crocus sold in the trade as *C. zonatus*, which is properly called *Crocus kotschyanus*. It grew well, but it never flowered, and I learned from the great crocus guru, Brian Mathew, that many of the commercial ones are infected with a virus—something not uncommon with clones propagated vegetatively. I got fresh stock from Janis Rukšāns and these are fine, flowering well and showing signs of increase out in the garden. Its delicate pale-lilac petals are veined with purple and each has two yellow spots in the throat. These four are the only true fall crocuses that I have so far found to be able to cope with our climate. I had limited success with *C. medius*, *C. longiflorus*, and *C. ochroleucus* in a very sheltered spot, but they clearly weren’t happy there and I moved them to pots in my frame, where they did much better. The first two are quite similar with rich lilac flowers and contrasting orange or scarlet styles; *ochroleucus* is small and white, with a yellow throat.

One other autumn-flowering bulb that I grow is the Autumn Snowflake, *Leucojum autumnale*. Like the last-mentioned crocuses it is marginally hardy here, despite being one of the earliest to flower, its delicate white bells appearing in late August to mid-September, so I keep a backup stock in the frame where it does very well.

Winter

This is when the bulb frame comes into its own. It's very small, only 16 inches by 4 feet (40 by 120 cm), and can accommodate 25 or 30 clay pots sunk into sand. It's really the well for a south-facing basement window protected by a lean-to frame fitted with old window panes. This arrangement allows me to admire and attend to the pots from inside even on the coldest winter day, and the temperature in the pots rarely, if ever, goes below freezing. I'm surprised how many species from Italian or Turkish stony mountainsides seem quite happy placed cheek by jowl in tiny clay pots in a rather *ad hoc* soil mix—roughly equal amounts of what passes for loam here, sand, and peat or leafmold.

Along with the three crocuses and the snowflake mentioned above, I have grown the following in the frame: *Crocus cancellatus*, white with dark feathering on the outside (there is also a blue form); *C. goulimyi*, with beautifully shaped, pale bluish-lilac flowers; *C. banaticus*, which has the three inner petals much smaller than the outer ones, and flowers in shades of purple; *C. niveus*, large white flowers with yellow throats; *C. tournefortii*, dark-veined blue petals which stay open even in dull weather; and *C. laevigatus* 'Fontenayi', the latest of all, often not appearing until the new year, petals white or pale lilac feathered with purple outside. I've had most of these for over 20 years and most have increased amazingly well. *C. hadriaticus*, another white-flowered autumnal species, has not done so well but survives. These autumn- or winter-flowering species provide interest outside my study window until well after Christmas. I try to repot every year, but sometimes it's only every second, and there was a period when they were neglected for four or five years but somehow survived, even if they didn't flower too well. When I repotted this year I had enough corms of most species to try a few outside in the rock garden; it will be interesting to see if any survive—*C. banaticus* and *C. goulimyi* are already coming up in mid-October. *C. banaticus* ought to be happy here since it is one of the species that doesn't like drying out in summer and flowers reasonably early.

It is here in the frame, too, that I try precious new acquisitions for any flowering season, and I usually add a few early spring bloomers if there is room. So, occasionally, I have had something in flower right through the winter, although I usually miss a week or two in January or February. The frame is also home to three precious cyclamen species: *Cyclamen hederifolium* 'Bowles Apollo', a 22-year-old *C. mirabile* (photo, p. 24), and a slightly younger *C. cilicium*, all of which flower in October and November.

Outside everything is usually covered by a protecting blanket of snow from about Christmas until late March, sometimes longer. There is often a thaw or two during the winter which can cause havoc with shallow-rooted perennials, but the bulbs are usually safe. (One January *Eranthis hyemalis* ventured forth during a warm spell and produced a flower, but it was never seen again!) *Cyclamen coum* survives well, but often tries to flower under the snow so that by the time we see them they are past their best. I was, however, very taken by these in Oregon during the 2004 Western Study Weekend and will try them again.

Spring

Our winters are less of a problem for spring bulbs since all they have to do is to sit tight until it's warm enough for them to put their noses up into the open air; spring here is not so different from anywhere else, just later. The snowdrops and early crocuses cannot appear until the snow has mostly gone, normally sometime in April, and we can have narcissus in June and tulips in July.

The first to flower are the *Crocus chrysanthus* hybrids, and while I generally stick to species rather than garden cultivars I do have a soft spot for them. I let them build up large patches that look wonderful when fully open in the spring sunshine. There is such a variety of colors, patterns, and flower shapes, they increase well, and of course they are readily available and happy in ordinary garden conditions. There are many named varieties (too many!), and if you buy from mass-market catalogues or garden centers there may not be a very close resemblance between the picture on the label and what actually comes up. Anyone who grows these for long will soon find strangers appearing in the patch since they tend to seed freely and produce new hybrids—but don't get too excited, no one ever made a fortune with a new crocus hybrid! That said, I am trying to increase a nice bronze hybrid that came up in my bed of 'Princess Beatrice'; I've never seen a commercial form much like it. Another species with readily obtainable garden cultivars is *Crocus sieberi*, which flowers a little later, needs a better-drained site, and increases less readily—'Hubert Edelsten' does better than the others and is one of our favorites, with its white inverted chevron on each of the rich purple outer petals. *Crocus tommasinianus* also builds up good patches, and I love the contrast between its silvery-lilac petals and the golden styles; the petal colors are back-to-front, with the outer paler than the inner. I've also tried some crocuses that are harder to come by. It seemed unlikely that a species from the high mountainsides of a Mediterranean island would do well here, but a small clump of *Crocus corsicus* (photo, p. 25) has lived at the top of the slope we call our rock garden for 25 years, and one of my pleasures of spring is seeing the purple-striped buds pushing up through the gravel mulch—they always remind me of snakes' heads. Its close relative, *Crocus minimus* (p. 25), which lives lower down in Corsica, didn't fare so well, but my second attempt in a better-drained situation seems to be doing better. *Crocus etruscus* sounded worth trying since it is a woodland species that manages without drying out, and it has survived its first year well with some increase despite initially not having ideal soil conditions.

Of course it's not all crocuses; most of the commoner small bulbs like *Chionodoxa*, *Scilla siberica*, *S. mischtschenkoana*, *Puschkinia*, and *Anemone* do well. *Fritillaria meleagris* is practically a weed, self-seeding all over the garden and growing vigorously in both purple-checked and white forms with a few intermediates—lots of twin flower heads and occasionally a triplet. We are just embarking on other species: *F. pallida*, *F. acmopetala*, and *F. camschatcensis* all seem promising, some setting seed. *F. michailovskyi* has not done so well, but someone must be able to grow it since it's so cheap in the local nurseries.

Another “C” we have started to explore is *Corydalis*. Rukšāns sells a cheap strain of *Corydalis solida* collected near Penza in southern Russia and they have produced a wonderful range of colors, much better than the insipid mauves I have seen in wild plants around Helsinki and Moscow, and they also increase by division. We are encouraged enough to have purchased some more expensive corydalis tubers for next spring.

Tulips generally require a summer baking, but my wife has accepted the challenge, and we have had some successes by careful selection and luck: *Tulipa kolpakowskiana* and *T. vvedenskyi* have done well on the rocky slope, and *Tulipa batalinii* ‘Red Gem’ seems happy in her gravel garden. The little yellow-and-white “fried egg” tulip sold widely as *Tulipa tarda* is another weed, seeding widely and mixing its genes with those of *T. turkestanica* and *T. urumiensis*, which have long since disappeared in the original.

Tulips take us well into June, leaving the alliums to fill the gap to the first cyclamen of fall. Although most of these are too tall for the rock garden, among the lesser-known smaller ones we have had success with are *Allium zebdanense* and *A. sphaerocephalon*. Rukšāns’s catalogue lists about 100 alliums, so there are plenty more to experiment with.

Perspicacious readers will note that I have hardly mentioned narcissus, and there is a good reason for that: we gave up growing them about 20 years ago when the narcissus fly was introduced into our area and effectively turned this genus into annuals. It attacks snowdrops too, but not so badly.

Sources

Any real bulb expert reading this will realize that we are not experimenting with rare and unusual bulbs so much as testing the limits of our climate. Nearly all our plants have been purchased as bulbs from commercial suppliers, initially importers of Dutch bulbs in Canada, then in the late 1970s and early 1980s from a number of specialist nurseries in England, in particular, Broadleigh, Mars (now Avon), and Potterton & Martin. Those sources dried up when the Thatcher government increased the cost of phytosanitary certificates, making small overseas orders prohibitive. It was only as I approached retirement and could see time to return to my hobby that we discovered Rukšāns in Latvia, with his marvellous list of species, many of which I had never seen in catalogues before (Janis Rukšāns Bulb Nursery, Rozula, Cesu raj, LV-4150 Latvia; janis.bulb@hawk.lv). The only group that I have generally started from seed up to now are cyclamen, mostly obtained through the Cyclamen Society, but after Ian Young’s inspiring visit on his recent NARGS tour I think seed will have to be our main route into new species in future, especially since I am now retired and supposed to have plenty of time to spare!

Howard Clase is a naturalist and gardener who has lived in St. John’s, Newfoundland, since 1968. Until recently he earned his living as a Professor of Inorganic Chemistry at Memorial University. His garden is shared with his wife, Leila, who mostly looks after the non-bulbous perennials.

Saxifrages of Newfoundland and Labrador

Todd Boland

Among the most popular alpine subjects for the rockery are the saxifrages. The genus *Saxifraga* is distributed throughout North America, Europe, Asia and even South America, so there are almost countless species. Within the world distribution of saxifrages, the Island of Newfoundland is but a speck, but we are fortunate to host six species—four quite common in the proper habitat, and the other two (fortunately the least showy) quite rare.

There is one ecological feature that all our native saxifrages have in common: all grow on limestone substrates. Knowing a little about the geology of Newfoundland will shed light on where you might come across saxifrages. Most of the Island is composed of granite and sandstones, rather acidic rock that is not favored by native saxifrages. However, the west coast of the Island contains several deposits of limestone and other basic rocks (mainly serpentine). The east and south coasts also have small limestone deposits. The west coast of the Great Northern Peninsula, from Gros Morne National Park to Cape Norman, is essentially one continuous band of limestone, a haven for calciphile alpinines such as saxifrages.

So which species do we have, where are they found, and how do they grow? The most common species is *Saxifraga aizoides*, the yellow mountain saxifrage (photo, p. 23). It is wide-ranging in North America and occurs in Europe as well. Of our six species, this is the last to flower, from late June to mid-August. It is locally abundant along the west coast of the Great Northern Peninsula but is also found less commonly along the west coast of the Island and in isolated areas of the south and east coasts, pretty much anywhere there are basic soils. *S. aizoides* grows in gravelly areas, but strangely for an alpine, it seems to prefer wet conditions. I have seen it with the leaves completely submerged, with just the blooms held above water. I have tried this species in cultivation, but it has always died, presumably because of lack of moisture. Perhaps I should try it along the margins of my water garden!

The next most common species is *Saxifraga oppositifolia*, the purple mountain saxifrage (photo, p. 19). This is the earliest to bloom, from mid-May to mid-June. Gravelly limestone areas of the Great Northern Peninsula are stained pur-

ple by its abundance at the peak of bloom. Alas, this beauty is another that is unhappy in cultivation, at least in my garden. St. John's, though cool relative to the rest of Canada, is downright hot compared to the native habitat of *S. oppositifolia*. I can only assume that it's the heat that does them in. Also, I've noticed that some of my plants developed a rust disease which sped their demise.

Saxifraga caespitosa, the tufted saxifrage, is one of the "mossy" types. It is regularly distributed along the Great Northern Peninsula and in limestone barrens of western Newfoundland. It generally grows in limestone gravels, usually on the sheltered side of a large rock, piece of driftwood, or even pop bottles; it's not too discriminating—any port in a storm. It is easy in cultivation as long as it gets some shelter from cold winter winds. Unfortunately, it is rather short-lived (although easy to start again from seed), and its small, dirty white flowers are not the most showy. It blooms from late May to late June in its native haunts.

One of the loveliest, both in and out of flower, is the encrusted saxifrage, *Saxifraga paniculata* (photo, p. 23). This mainly European species is uncommon in eastern North America. The form in Newfoundland is referred to as variety *labradorica*. Ours have shorter flower stems than most European forms and smaller, off-white, heavily spotted flowers. The leaf rosettes are typical of the species, but again, smaller than the average. These saxifrages have a weaker constitution and are hence a little more challenging. In my growing experience, *S. paniculata* var. *labradorica* seems happiest when growing in tufa or in a trough. In the wild, it is quite uncommon, although found nearly Island-wide (except on the Avalon Peninsula). It mostly grows along limestone cliffs overlooking the sea, blooming from mid-June to mid-July.

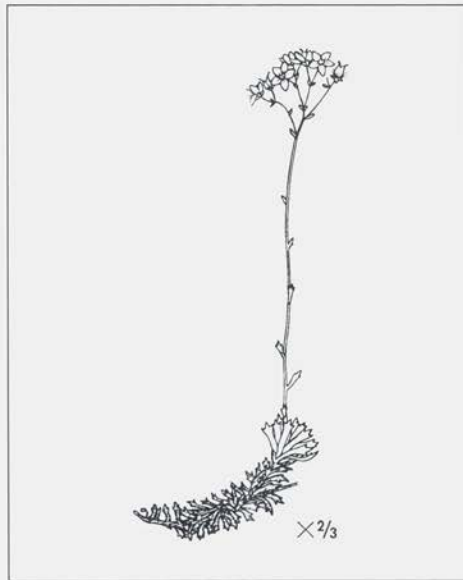
Our other two native saxifrages are quite rare. Both are referred to as "snowbed" species; they grow where snow lies late, providing them with consistent winter protection. Once thawed (possibly not until late August!), they start immediately into growth, flowering and setting seed in a matter of weeks. On the Island, these species are restricted to north-facing slopes of the Long Range Mountains of western Newfoundland and the Great Northern Peninsula. *Saxifraga foliolosa*, the leafy saxifrage, is the rarest saxifrage on the Island. It is restricted to sheltered, wet areas. Plants produce a basal rosette of oval, leathery leaves and wiry stems topped by a few white flowers with distinctive pink ovaries. *Saxifraga rivularis*, the alpine-brook saxifrage, is found along (and often within) streams that arise from melting snowbeds. This species has somewhat palmate leaves and very small white flowers. Cultivation is apparently quite difficult for these two species and of interest only to the avid saxifrage enthusiast.

But what is the situation in Labrador, the northernmost portion of the province? All six species previously mentioned occur there, along with an additional four. Three of the additional four species are not especially garden-worthy. Just as well, for they grow only north of 57° N latitude in Labrador, an area accessible only by helicopter. The starry saxifrage, *Saxifraga stellaris*, is similar to *S. rivularis* in both leaf and flower habit and in its tendency to grow in snowmelt streams. The nodding saxifrage, *Saxifraga cernua* (photo, p. 23), produces fleshy palmate leaves and stems topped by a single white flower. Curiously, this species

has never been observed to produce seed; it reproduces via bright red bulbils produced in the leaf axils of the flower stems. This species is found not only in the Arctic but also throughout the high Rockies. The alpine saxifrage, *Saxifraga nivalis*, appears similar to *S. foliolosa* in leaf habit but produces a stout stem topped by a cluster of small white flowers. Its sepals are conspicuous, green with burgundy backs. It is found only in the Arctic. Unlike the saxifrages from the Island portion of the province, the three saxifrages just described grow on acidic substrates rather than limestone.

The fourth additional species found in Labrador is the prickly saxifrage, *Saxifraga tricuspidata*. It is a calciphile that occurs in the province only at the northernmost tip of Labrador, just across the strait from Baffin Island. It is another confirmed Arctic inhabitant, common in Alaska. It is very attractive, with dense rosettes of stiff, narrow leaves tinted burgundy-red. Its habit is similar to that of the Rocky Mountain species *S. bronchialis*. The stiff stems are topped by a loose cluster of primrose-yellow flowers with fine purple spots. I've never grown this species nor seen it in cultivation, but in the wild it appears very desirable. There, it commonly grows tucked into cracks in rocky outcrops.

The province of Newfoundland and Labrador is blessed with many native arctic-alpine plants. While we have a mere ten native saxifrages, only four which are likely to be seen by the average rock garden enthusiast, they do constitute a conspicuous feature in our arctic-alpine flora.



Saxifraga tricuspidata, from Eric Hultén, *Flora of Alaska* (Stanford University Press, 1968).

A New Atlantic Rock Garden

Bernard S. Jackson

There is a new rock garden in eastern Canada, at the Nova Scotia Agricultural College in Bible Hill, near Truro. Its primary purpose is student education and public interest and enjoyment. Covering approximately three-quarters of an acre, it is built in a semi-naturalistic style and includes a low cliff, scree, dry streambed, crevice garden, rocky gully, dry stone wall, small limestone bed, and alpine trough courtyard. The bridges and a lookout platform have been built of natural white cedar and will be allowed to weather naturally. (Photos, p. 28.)

The garden is sponsored and funded by a small but dedicated group, the Friends of the College Gardens, assisted when available by the grounds staff and summer students working at the college. Construction and planting are well advanced by 2004 but continue as additional funds are raised, and so it may be some time before we who are involved with it are fully satisfied. Nonetheless, it is already an exhibit of great beauty, of interest to the local people and visitors alike.

The rock garden has been shaped from a gently sloping bank, formerly covered with grass. It enjoys full sunlight and good air circulation; receiving sun in an arc from east through south to west, it has some very hot areas. The general region is considered to be in USDA Hardiness Zone 5a (winter lows to $-20^{\circ}\text{F}/-30^{\circ}\text{C}$).

More than 500 tons of quartz-rich alkali-feldspar leucogranite (locally called Salmon River pink granite) were placed into the sandy loam naturally occurring on the site. A special soil mixture of one-third loam, one-third compost, and one-third clean sharp sand (from the granite quarry) was spread at varying depths over the surface and more deeply in certain planting pockets. The mulch is $\frac{1}{2}$ -inch gravel of the same granite. The rockwork blends nicely with the local soil and surrounding campus buildings.

The sandy loam is naturally well drained and so far appears compatible with good plant growth for all those species not requiring more specialized treatment. Because of the hot summers and good natural drainage, we have installed an in-ground sprinkler system that can be directed to individual sections of the display. When necessary, it is turned on at 6 a.m., before the day becomes too hot.

Unless it is considered unsuitable for certain plants, all acquisitions are planted with a dusting of bone meal to get them off to a good start. The bone meal was donated by a local animal food manufacturer and tested as having very slight nitrogen content. Plants have responded well to it without any obvious over-growth.

An enormous number of plants is required to fill an area this big. Not all the plants used so far could be considered typical rock garden subjects, but many have been added to please the public, to provide students with learning material, and, of course, to fill the space. Revision will be continuous as more appropriate species become available. The plants removed can be used elsewhere on the campus or sold in the Friends' annual plant sales. Many seedlings are being grown on for future planting.

Growing alpine and saxatile plants is relatively new in this area, and so we have a lot to learn about what will succeed here and the individual requirements of various species. My own experience in St. John's, Newfoundland, is not necessarily pertinent to gardening in the very different climate of Truro. Also, now that I've been retired for a number of years, I'm finding that "senior moments" are not conducive to identifying the multitude of these glorious little plants! Moreover, it seems to me that there are many "new" plants coming into cultivation for which little if any cultural information is available.

One problem at present, because we have so much bare soil, is weed control and the removal of unwanted self-sown seedlings. Definitely a doubtful blessing are *Euphorbia myrsinites*, *Viola pedata*, *Sedum spurium*, *Dianthus deltoides* 'Arctic Fire', and *Potentilla* 'Rex Murfitt', which appear bent on taking over the whole garden. The last-mentioned is now relegated to the edge of an adjacent roadway to see if it can withstand the snowplows yet still provide a nice shiny dark green groundcover.

A group of plants that has stirred great interest is our cacti. In addition to the prickly pear (*Opuntia humifusa*), we have *O. macrorhiza*, *O. cymochila*, and *O. phaeacantha* ssp. *camanchica*. All survived their first winter (2003–2004), with temperatures down to -30°C plus wind and no snow cover. They are situated on a hot, flat area backed by a rock cliff to reflect heat, in a very well drained growing medium. The cacti are combined with such plants as *Yucca elata*, *Y. glauca*, *Delosperma basuticum*, and *Verbascum dumulosum*.

A section that is causing much comment and quickly becoming a favorite spot of mine is the trough courtyard, which is enclosed by dry stone walls and a crevice garden. We were fortunate to be able to pave this courtyard with hand-cut limestone sponsored by a grant from NARGS's Norman Singer Endowment Fund. This generous support has greatly enhanced the appearance and quality of our overall project and is much appreciated. The troughs are being fashioned from 20 hand-cut sandstone blocks donated by the Town of Truro, but it will be some time before we can afford to have them all carved out. Not all will be placed in the courtyard; some, especially the larger ones, will rest in suitable sites around the garden. We are following the British style of installing small, irregularly shaped ground-level plantings around each trough.

The crevice garden is somewhat different from the norm in that we not only used the same granite used elsewhere but also incorporated flat stones sunk deeply on end to create constricted, cool, plunging root runs. This will not appear obvious as the plants expand and mingle. Some plants used here are *Dianthus alpinus*, *D. freynii*, *Phlox kelseyi*, *Silene acaulis*, *Saxifraga* 'White Hills', and *Origanum libanoticum*. This feature was built in 2004, and we anxiously await to see how the plants weather their first winter.

We haven't yet decided on our long-term approach for planting the troughs. Presently we're simply planting suitable subjects that look good together. However, we may later make more specific plantings in troughs. Some possibilities include plants of the Cape Breton Highlands of Nova Scotia, or plants of the Northern Peninsula of Newfoundland. A fairly large trough showing variation in the genus *Sempervivum* or in dwarf *Sedum* species will likely be initiated next year.

The dry stone wall provides a useful site for plants that can send their roots well back into small crevices or that do well with exceptionally good drainage around the crowns. Here we have *Chiastophyllum oppositifolium*, *Campanula sarratorii*, *Androsace studiosorum*, *Hypericum cerastioides*, and, in a shadier aspect, *Ramonda myconi*, *Lewisia cotyledon*, and *Haberlea ferdinandi-coburgii*.

When the 2005 annual meeting takes place in St. John's, I hope that any delegates motoring here will call in and see our new effort: Truro is on your way. Though our American friends are not permitted to bring plants across the border without all the necessary permits, I hope too that Canadian delegates who have suitable plants to share will drop them off for us—goodness knows we need all the plants we can get!

Bernard Jackson of Truro, Nova Scotia, was a professional naturalist before going into horticulture. He built the rock garden at Memorial University in St. John's, Newfoundland and worked there for 22 years until retiring. He is an Honorary Associate of the Nova Scotia Agricultural College and received a Professional Citation from the American Association of Botanical Gardens and Arboreta. In addition to gardening, his interests include birdwatching, plant photography, and speaking to garden clubs. He has also authored a book on butterfly management.

Arctic-Alpine Plants of Western Greenland

Todd Boland

The year was 982. A Norseman, Erik the Red, had just been exiled from Iceland for killing his neighbor's son. A few days after sailing northwest from Iceland, he discovered a new land of imposing ice-capped mountains and deep sheltered fjords. To taunt his fellow Norsemen back in Iceland, he called this new land Greenland. Over a thousand years later, Greenland appears essentially unchanged under the impact of civilization. Today about 55,000 people live there, a mixture of Danish and Inuit.

During August 10–20, 2004, I was invited on board a cruise ship, the M/V *Orlova* operated by Quark Expeditions, which sailed from western Greenland to my home city of St. John's, Newfoundland. My duties: ship botanist and historian (I'm a jack of all trades!). With my keen interest in the native arctic-alpines of northeastern Canada, I was quite familiar with the flora of Greenland owing to the many overlaps between the species found there and in northern areas of my own province. However, this was my first actual sight of the flora in Greenland, so I was quite eager. On August 10, our charter plane arrived in Kangerlussuaq, the main airport in Greenland. This community is at the head of the 100-mile-long Søndre Strømfjord, one of the longest fjords in the world. A large river flows through the town and the soil was nearly pure sand, resulting in rather dusty, gray surroundings. However, surrounding the town were steep hillsides covered in shrubs 2–3 feet (60–100 cm) tall, primarily dwarf birch (*Betula nana*) and northern willow (*Salix glauca*; photo, p. 19). Before we boarded the ship, we took a bus ride to the summit of the surrounding hills. Here we were greeted by a lovely arctic valley overlooking a large lake and the distant Greenland icecap. Feeding along the shores of the lake was a herd of musk oxen. Here was my first chance to get out and explore the flora. The valley was quite green but diversity was scant. Late in the season, only a few herbaceous arctic-alpines were still blooming, among them the ubiquitous *Campanula rotundifolia*. A few lingering blossoms of *Cerastium alpinum* and *Saxifraga tricuspidata* were the only other flowers I saw. Among the willow and dwarf birch were ripening berries of crowberry (*Empetrum nigrum*; photo, p. 17) and alpine bilberry (*Vaccinium uliginosum*).

That evening we set sail, amazed when at 11:00 p.m. there was still plenty of light to take pictures of the looming cliffs of the fjord. Late the next afternoon we arrived in Illulisat, a small coastal community (population 4000 people and 6000 dogs) about 700 km north of Kangerlussuaq. Here we watched one of the most spectacular glaciers in the world spawning huge icebergs that would eventually float past my own home in St. John's, some 3000 km south. Despite the fog and drizzle that evening, the brightly colored houses of the town glowed like a kaleidoscope in the gloom. Blue, green, red, and yellow, all with clean white trim, the houses had a definite Scandinavian look.

The next morning we went ashore for a hike across a tundra headland. Coastal areas, being relatively milder, hold a far greater diversity of plant species than inland. The shrubs seen in Kangerlussuaq were still quite common but were now joined by drifts of narrow-leaved Labrador tea (*Rhododendron palustre*), *Loiseleuria procumbens* (p. 18), *Cassiope tetragona*, *Phyllodoce caerulea*, and tufts of *Silene acaulis* and *Dryas integrifolia*. Had I been here a month earlier, the hillsides would have been awash in color. As it was, there were still quite a few lingering arctic plants flowering, among them *Saxifraga caespitosa*, *S. tricuspidata*, *S. nivalis*, *Potentilla tridentata*, *Polygonum viviparum*, *Silene involucrata*, *Cerastium alpinum*, and *Stellaria longipes*. Overall, I was delighted.

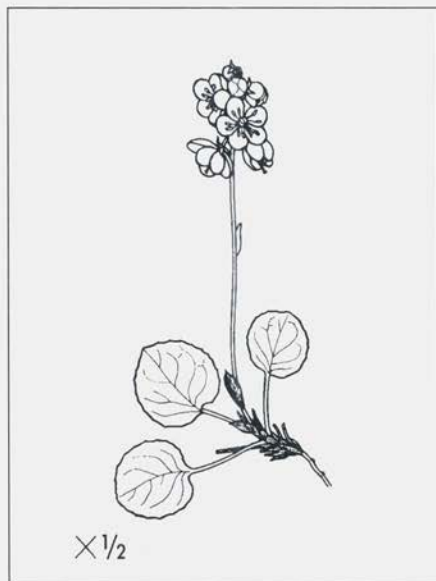
The following morning, August 13, dawned with clear blue skies. Overnight we had sailed back south to the town of Sisimiut, located at the mouth of the Søndre Strømfjord. This was the most picturesque community in our entire trip. The vibrantly colored homes perch atop the cliffs and hills that surround this very mountainous terrain. We had several hours to wander through the town and surrounding valleys. This was by far the lushest area I saw in the country. Most of the previous species were seen here along with a multitude of new ones. In Sisimiut itself, the roadsides were covered in a dandelion (*Taraxacum lacerum*), a weed to us but actually encouraged in the gardens of Sisimiut. A small stream flowing through the town was bordered by a "river" of *Epilobium latifolium*, the national flower of Greenland, called "river beauty" by Canadians and "dwarf fireweed" in the United States. Strangely, *Cassiope*, *Loiseleuria*, *Phyllodoce*, and *Dryas* were absent from the tundra areas here, replaced by the willows *Salix arctica* and *S. herbacea* (p. 21) and the lingonberry, *Vaccinium vitis-idaea* var. *minus* (p. 18). Many of the same herbaceous plants were present, as well as a few additional species such as *Lychnis alpina* (p. 22), the arctic poppy *Papaver radicum*, *Pyrola grandiflora*, and *Pedicularis lanata*. Damp depressions throughout the town and countryside were a sea of waving silvery plumes, drifts of the cottongrass *Eriophorum scheuchzeri*. Here and there were small rock faces with natural seepage springs. These areas were home to the bulbous saxifrage *Saxifraga cernua* (p. 23), *S. rivularis*, the succulent roseroot *Rhodiola rosea*, and *Arabis alpina*. These cliffs were also home to the only ferns I saw in Greenland: *Cystopteris fragilis* and *Wood-sia alpina*.

Our last stop in Greenland was Nuuk, the capital, with a population of about 15,000. This town too is surrounded by towering mountains, most of which were still snow-covered. The population of Inuit and Danes is quite clearly segregated

in Nuuk, with the Danes living in classical brightly colored houses while the Inuit live mostly in large gray apartment buildings that look decidedly Russian-influenced. The most memorable event for us in Nuuk was being serenaded by a dozen Inuit singing “Frère Jacques” in Inuktitut, their native language, behind a 250-year-old Catholic church.

Botanizing was minimal in Nuuk, but I managed to wander the coastal headland behind the church, adding to my plant list *Alchemilla alpina*, fireweed (*Epi-lobium angustifolium*), and the tallest herbaceous plant I saw in all of Greenland, *Angelica archangelica*, towering to 1.2 meters (4 feet). Iceland poppies (*Papaver nudicaule*) were blooming in profusion all over the town and hillsides, but these are actually garden escapes (I also saw the first real gardens of the trip in Nuuk).

On the evening of August 14, we set sail across the Davis Strait, en route to the Labrador coast and finally back to Newfoundland. Botanizing was left behind, and now I switched gears to watching for whales and seabirds. I always had a desire to see Greenland, but never thought I’d get the chance. This trip was a chance of a lifetime, giving me a greater appreciation of the challenges faced by plants that survive in arctic-alpine areas. I was greeted by many familiar plants, but also saw many new ones. Greenland, at least the coastal areas, is indeed green, and a haven for a wonderful assemblage of arctic-alpine plants.



Pyrola grandiflora, from Eric Hultén, *Flora of Alaska* (Stanford University Press, 1968).

Rock Gardening at Wave Hill

Lola Lloyd Horwitz

As a volunteer at Wave Hill, a notable estate turned public garden in Bronx, New York City, during the past three winters, I have become familiar with how its former director of horticulture, Marco Polo Stufano, his successor, Scott Canning, and the dedicated and talented staff have worked together to make this collection of gardens a Mecca for garden lovers from all over the world.

Among the special attractions for NARGS members (certainly for me) are the Alpine House, the Wall Garden, and the Wild Garden. In order to reach the Alpine House you must pass through the Herb and Dry gardens, as I've done on each visit, and I now realize that they are an intrinsic part of my Wave Hill experience. You will also want to visit the Flower Garden, the Conservatory and Greenhouses, the Conifer Collection, the Monocot Garden, the Aquatic Garden, the Woodland, and, in summer, the glorious mass display of potted plants below and around the pergola that frames the view to the Hudson River and the distant Palisades—a view that alone makes a visit worthwhile.

Early in his tenure at Wave Hill, in the late 1960s, Marco Stufano decided that he had enough greenhouses in desperate need of rebuilding without fixing the three on the terraces rising behind the potting shed. With curator John Nally and a small band of willing laborers-turned-gardeners and gardeners-turned-laborers, Marco removed all but the stone walls of the old greenhouses, set new bluestone walkways where needed, created planting beds in the space of the old benches and against the walls, and planted sun-loving herbs, both hardy and tender. This first terrace became the Herb Garden and took shape over a decade of changes throughout the property.

The Dry Garden (photo, p. 26) lies above it on the second terrace and includes euphorbias, yuccas, hebes, and many other plants that like to bake in this south-facing, highly reflective area. Some pots of agaves from the Cactus House summer on the walls and look very much a part of the spiky blue-gray foliage mixture that dominates the Dry Garden. I am very taken with these terraces in winter, too, when the desiccated tawny brown of salvia, the grays of lavender and santolina, the green of euphorbia, and the eye-catching gold of a variegated *Yucca filamentosa* are beautifully framed by the blue-gray walls and framed again by the

columned evergreens at the ends of beds. Marco's gift was to read the site for what would flourish, both physically and aesthetically, while leading visitors to think that they might try something similar in their gardens.

On the top level, in a different century, we might have found a large fountain with sculpted horses rising out of it; here Marco first envisioned a pit house, a structure an avid suburban gardener in Westchester might also consider, but it didn't take much digging before the crew hit bedrock. Instead, in 1982 the 51-by-15-foot Alpine House with 20 front and roof panels was built, and a decade later they added a massive set of bottomless hypertufa troughs. Visitors can view the Alpine House from very close up and can walk through the trough collection, enjoying them at different heights since many are stacked, which allows deep-rooting plants such as an old *Salix yezo-alpina* or "dwarf" conifer to root up to 4 feet down. Because it is such an exposed location with greatly fluctuating temperatures, all these troughs are covered for winter with evergreen boughs that are not removed until March. However, most of the approximately 20 traditional troughs are brought inside the Alpine House for the winter. Gelene Scarborough, who has responsibility for the Dry Garden, troughs, Alpine House, and Wall Garden, is comfortable with this very hands-on attention. All the front and roof glazing panels except those over the western American alpiners (five species of *Townsendia*, various eriogonums, and lewisias) and helichrysums, are removed from May through October. Winter is even busier in the Alpine House. On any sunny day, as the inside temperature edges over 40°F/5°C, front panels are gradually removed, sometimes almost all of them; then, as the day cools, the panels are replaced.

In the early days, heat was provided by large solar tubes filled with water lining the rear concrete wall, plus some electric back-up heat. However, John Emmanuel, then curator, couldn't prevent wide temperature swings and lost some fine plants, so the tubes were removed and thermostatically controlled heaters were hung from roof supports. Additional large fans, and some of clip-on size, are strategically placed to provide constant air circulation 24 hours a day. The plants are happier, but this volunteer needs many layers to maintain body heat!

The original plant collection in the Alpine House was in large part a gift of Paul and Margaret Halladin, longtime members of NARGS, who were moving to Europe. Two station-wagon loads of alpiners included some magnificent *Draba mollissima*. Harold Epstein was a regular visitor and donor, his contributions extending throughout the gardens. Nick Nickou came almost every Friday on his way to the opera and usually brought the first curator, Janet Reidy, a new plant for the collection. Finally, no significant project in the rock garden world, at least in the East, could take place without arousing the interest and generous support of Frank and Ann Cabot. Marco had a great crew at his command and some fine supporting players in the wings.

Initially, Marco wanted to "make a bow to Stonecrop" (Frank and Ann Cabot's garden and famous alpine house in Cold Spring, New York) and indirectly to the Royal Botanic Garden at Kew, by "showing alpine plants as little

jewels to be admired one at a time,” each perfectly grown in its pot and moved to the front when in bloom, since the public couldn’t wander around all the benches. There were no distractions; it was all about the individual plants. Larry Thomas, who rock-gardens on a terrace in Manhattan, recalls the exhibits put on by Wave Hill during those years at the New York Flower Show. One in particular was a dazzling collection of beautifully grown alpine plants and bulbs (including a large pot of *Tecophilaea cyanocrocus* in full bloom) displayed in a Wardian case, a type of terrarium. New Yorkers hadn’t been treated to this in recent history, and it sent chills up our spines and surely contributed to the healthy start-up of the Manhattan Chapter of NARGS.

As years passed, staff changed and certain plants started seeding themselves into the bench sand beds—cyclamen, poppies, dwarf *Limonium*—and other plants, such as Japanese maples, dwarf *Chamaecyparis* varieties, and *Grevillea*, gained in stature. Since three-quarters of the Alpine House is closed to the public and is used as a growing and propagation area, the larger plants were combined with rocks and logs and used as a screen (but also scene) against which the show plants are displayed. Visitors can see the entire Alpine House from the front windows, but their focus is on the front display. Gelene Scarborough is interested in exploring many species in a genus, and also in trying seeds of plants from below the Equator. All the staff members are extremely thorough in conducting research on the native habitat and growing conditions of each species. (I know this because I’m sometimes asked to fit crucial bits of that information on the plant labels.) Wave Hill has a fine collection of reference books and a staff that never hesitates to use them.

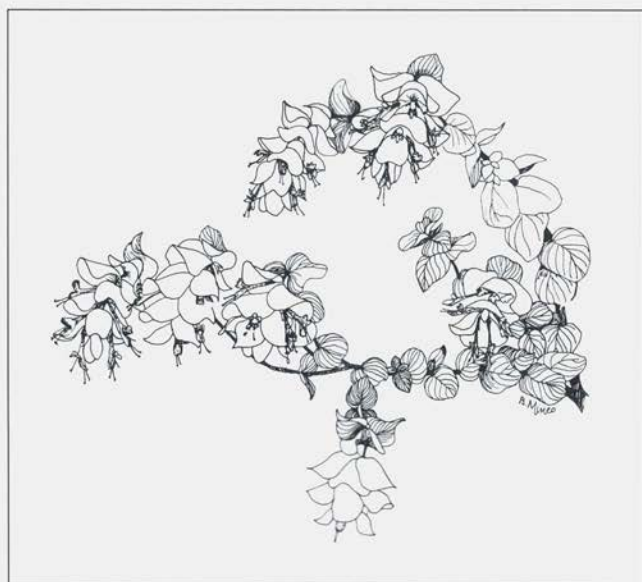
John Emmanuel, who has been at Wave Hill for 23 years, sees a parallel between what goes on in the Alpine House and the handling of the Wild Garden. The latter is just a retaining wall (the Wall Garden) and shrub border away, but it feels like a different world. Nonetheless, it too features a play of smaller, changing textures and colors against more solid foils: here, a summerhouse partially engulfed by a century-old, tightly sheared yew, other more vertical conifers, and a large, sprawling sumac at mid-slope. Within and around these grow a huge variety of plants, including a large stand of *Yucca glauca*, swaths of *Eranthis hyemalis* in late winter under the bare branches of the sumac, tender salvias in fall against the burning foliage of a *Fothergilla*, and many more wonderful juxtapositions that have made my visits such a pleasure over the past two decades.

The Wild Garden (p. 26) has a close alliance with nineteenth-century garden writer William Robinson’s notions: its plants are mostly species rather than garden hybrids, and if they are a bit rough and tumble, or if they seed themselves here and there, that’s part of the plan. Marco says that a parallel influence in the development of this garden was Fort Tryon Park, home to The Cloisters, which is just over the “border” in the northernmost section of Manhattan, also perched high over the Hudson. The way that park fits its site pleased him, and he attempted to find a similar fit between plant material, existing framework, slope, and distant view at Wave Hill. However serendipitous the illusion is, everything—the juxtapositions of plants, sequence of blooms, shapes and size of bulbs, per-

ennials, annuals, and evergreens—is carefully thought out by the staff, and in particular by curator Kevin Bost. As any gardener knows, editing is a constant task.

At this writing, Wave Hill has just completed construction of a new visitors' center. I will be back this coming winter to continue my education and refuel my imagination. I keep in mind Marco's motto not to be afraid to try anything—the worst that can happen is that the plant will die. We've all done it. Come see how Wave Hill has done it and kept its visitors thrilled.

Lola Lloyd Horwitz, chairperson of the Manhattan Chapter of NARGS, extends an invitation to all NARGS members to attend the 2006 Eastern Winter Study Weekend, which will be held in Lower Manhattan and will provide opportunities to visit New York City's magnificent public gardens before and after the weekend. Read about them in *Garden Guide: New York City*, by Nancy Burner and Susan Lowry, which describes 100 public gardens in five boroughs.



Origanum rotundifolium, drawing by Baldassare Mineo

The Art of Splitting Boulders

David Sellars

According to many authors, the ideal rocks for building a rock garden are slabs of sedimentary rock that can be arranged to give the appearance of a natural stratified rock outcrop. A comprehensive guide to achieving this effect is provided in the chapter “Crevice Gardens” in the NARGS book *Rock Garden Design and Construction* (2003). If stratified rock is not available, it is recommended to try and obtain rocks with at least a flattened profile.

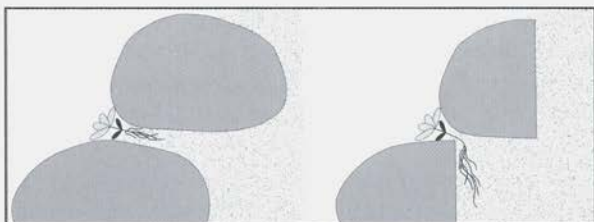
Rocks are a significant asset in a rock garden, apart from merely being the eponymous heroes of the enterprise:

- Rocks provide an aesthetic background for alpine plants and in my view should be given considerable prominence, rather than being mostly buried like an iceberg.
- They enhance the deep, cool root runs desired by alpinists.
- Rocks retain the soil on steep rock garden slopes.

Many of us do not have access to affordable stratified rock, but boulders are generally much more available. Glacial erratics are scattered over much of North America, and fortunately many gardeners consider them a nuisance. I have been able to establish a flourishing trade on our street exchanging the neighbors' unwanted boulders for our surplus rhododendrons.

Construction of rock gardens using boulders is a challenge primarily because glacial action has rounded off the edges, leaving few flat planes suitable for forming crevices and providing that “ideal” stratified look. A significant drawback of using rounded boulders in rock gardening is the unavoidable creation of shallow planting pockets when one is trying to construct horizontal crevices on steep slopes. These shallow pockets can easily dry out and limit the potential extent of plants' root development. Figure 1 shows how rounded boulders restrict the rooting depth of the crevice compared with split boulders. Vertical crevices are also awkward to construct with rounded boulders.

Splitting rounded boulders to create flat sides can overcome this problem. Split boulders can be used to create very natural-looking crevices by fitting two



pieces back together to make a crack of any desired width (see photos above). This process also allows us to move very large rocks in pieces which can then be fitted together to look like a very large boulder in the rock garden, if that appeals to you. It certainly does to me.

Splitting boulders is actually much easier than it sounds and gives the rock garden designer many more options in working with odd-shaped rocks. It not only makes the pieces easier to move but can also provide two rocks for the price of one.

Boulders can be split by gardeners using traditional rock-quarrying methods used for centuries. Holes are drilled in the rock along the desired line of cleavage and special sets of steel wedges are inserted in the holes. The wedges are hammered until the rock splits apart. This is feasible because the tensile strength of rock is very low compared with the compressive strength. That is why reinforcing bars are used in concrete construction: without them, concrete structures would crack and fall apart.

The sets of steel wedges are called “plugs and feathers” in quarrying terminology and “wedges and shims” by stone masons. The feathers are hung on the edges of the hole and the plug inserted between the feathers. Figure 2 shows two sets of plugs and feathers, $3\frac{3}{4}$ inch and 5 inches long. The smaller set requires a $\frac{3}{4}$ -inch hole to be drilled, while the 5-inch set needs a $\frac{7}{8}$ -inch diameter drill hole. I recommend the 5-inch set, which can be used to split large boulders at least 30 inches thick. Plug and feather sets of different sizes (up to 24 inches long) are available from www.miconproducts.com or www.granitecitytool.com.

A hand-held star-drill struck with a hammer was the historic method of drilling holes in rock. The best modern solution is to obtain a powerful rotary hammer drill with SDS (Socket Driver System), which can drill the required hole

depth in minutes. The SDS feature locks the bit in the chuck and eliminates bit slippage. Special carbide-tipped rock-drilling bits are required and will need periodic sharpening, particularly when drilling coarse granite with quartz particles. Drill bits can be sharpened using a special silicon carbide (greenstone) grinding wheel on a bench grinder.

Rotary hammer drills are often specified in terms of their concrete-drilling capability. I have found that for drilling rock, you need a drill that will comfortably drill a hole in concrete $\frac{1}{4}$ inch larger than the required hole in rock. For example, if you decide to use 5-inch long plugs and feathers, you will need to be able to drill a $\frac{7}{8}$ -inch diameter hole in the rock—i.e., a drill capable of at least a $1\frac{1}{8}$ -inch hole in concrete. A drill of this size will have more than 3 foot-pounds of impact energy and will require about 8 amps of power. I have tried cordless drills, and they simply do not have sufficient power.

For safety you should wear steel-toed boots, eye protection, and heavy gloves, as the drill bits get very hot. The biggest hazard is being too relaxed while drilling because the power of the drill is masked by being deceptively quiet. Grasp the drill with both hands and seat it firmly in the hole before applying full power; otherwise the kick-back could wrench your arm muscles.

Drill the holes slightly deeper than the length of the plugs, spaced about 6 inches apart along the desired line of the split. Australian quarry workers charmingly call this “stitch drilling.” Hang the feathers in the hole and insert the plug between the feathers, as shown in Figure 3. Note how the plugs and feathers are oriented perpendicular to the desired line of split. Then strike each plug once sequentially with a sledge hammer to provide gradually increasing splitting force along the line. The feathers have a reverse taper compared with the plug, which results in even force being applied throughout the depth of the hole. After several rounds of striking the plugs, the rock will suddenly crack and the boulder will split and fall apart. With a large boulder, the sudden movement could be hazardous—hence the steel-toed boots. If the rock fails to crack, I have read that an old quarryman’s trick is to leave it overnight and it will have split by the next morning.

The photo on p. 27 shows crevices created in split boulders planted with *Saxifraga oppositifolia*, *Lewisia cotyledon* var. *heckneri*, *Androsace lanuginosa*, *Saxifraga paniculata*, *Phlox douglasii*, *Penstemon rupicola*, and *Saxifraga longifolia*. The deep planting pockets and large rock surfaces for the surface-spreading plants should ensure excellent growing conditions.

Being able to split boulders allows greater creativity in rock garden construction and provides better-shaped rocks and growing conditions for crevice gardening. The only drawback is that rock splitting can become addictive. There is definitely something magical about a large boulder splitting apart like a gigantic hazelnut.

David Sellars of Surrey, British Columbia (near Vancouver), an engineer and rhododendron enthusiast as well as a grower of choice alpinists, has also contributed articles on winter protection structures and western alpine plants, as well as several award-winning photos, including one of his rock garden in the winter 2004 issue.

Why “Rock?”

Nicholas Klise

Why is rock gardening called “rock” gardening? What is it that always requires this particular mode of gardening to have that peculiar modifier? Usually gardening is accepted on its own terms without any such modification. An obituary says “She was a gardener” and leaves it at that. We assume that the deceased grew plants—maybe petunias in coffee cans, maybe tomatoes, maybe perennial borders, maybe trees—but it really doesn’t matter, because all modes of gardening can be generalized under the umbrella of the conventional and traditional terms we use. Rock gardening, however, stands apart: we always have to use the word “rock.”

This is an unfortunately confusing modifier for the word “garden,” but we are going to have to live with it, as there is no better alternative. Even if we could come up with a more descriptive term, how would the new phrase supplant one that has been in coinage for more than 150 years?

From the very beginning of the nineteenth century, when improved transport allowed plant collectors access to remote regions, gardeners realized that most of these unfamiliar plants required techniques different from those they had employed up to that time. The first mountains that Europeans explored for plants were their own Alps, the root of the word “alpine” meaning “of the mountain environment.” The most conspicuous element of the landscape in which the Alps’ small, floriferous plants grew was exposed rock. Consequently, gardeners made an immediate connection between the alpine plants and the rock in which they flourished. Growers who attempted to cultivate these plants at low elevations very quickly figured out that there *was* a connection between rocks (or, at least, soil type) and success. Pioneers in this new kind of gardening displayed plants with exposed rock as a way of defining a technique distinct from growing vegetables or familiar border flowers.

There is little evidence that having exposed rock piled somewhere in the garden will ensure success in growing unusual plants. To the nineteenth-century horticulturist, this rock pile was more symbolic: the mark of a sophisticate, a citizen of the world (at least, of Europe), and the most progressive, up-to-date gardener (at least, he pretended to be). The more pretentious dismissed the grow-

ing of alpine plants altogether and opted for an elaborate display of mere rocks. Even today there exist rock piles on British estates, bearing witness to this early phase of rock gardening. By the end of the nineteenth century, the term “rock garden” was both firmly established in the vernacular and as perversely confusing as it remains today. By the end of the twentieth century, there were worldwide societies that celebrated this distinct type of gardening. However, the general public, including those of it who call themselves “gardeners,” still haven’t a clue to the meaning of the term, and particularly the word “rock.”

In 1929, Sir William Lawrence met with a few other enthusiasts in London with the intent of starting a rock garden society. These people were real horticulturists, and they immediately started debating the terms by which their new club would be defined. At first, the ones who had grown up with the term “rock garden”—let’s call them the rock contingent—insisted that the term was legitimate and self-explanatory. The more horticulturally inclined—for short, the hort contingent—protested that the term was vague and misleading, since there was ample evidence that middle-class pretenders had debased it by piling up rocks in their gardens without the slightest knowledge of horticulture. The hort contingent won the argument and proclaimed that the club would be called the *Alpine Garden Society*. The rockers protested that they were interested in much more than alpine plants, but that name became engraved on stone.

It’s true that the term “alpine” seems too limited, but when its usage is expanded to substitute for “mountain-dwelling,” it does make sense. After all, mountains contain many habitats, including deserts, meadows, bogs, fens, dark forests, sunny screes, lakes, glacier-fed moraines, tundra, and rock—lots and lots of rock. As knowledge of the world grew, it became apparent that not only were there many kinds of habitats (and their plants) in mountains, but also other mountains strikingly different from the Alps. The mountainous hinterlands of China contain a universe of plants, but this region is markedly different from the Appalachians, or from the mountains of Turkey, Central Asia, or New Zealand. When we realize this, the term “alpine” seems as ill-defined as “rock.”

Similarly, gardeners have trouble with the term “hardy plant.” Although most of the plants we’re interested in growing are hardy in our own particular gardens, it’s useless to define our rock garden plants as “hardy.” That means simply that the plant is not tender—it won’t die if it freezes. By the turn of the twentieth century, however, this label had also come to represent a style of gardening that used “hardy” plants rather than tender exotics grown under glass and “bedded out.” This was a revolution against the Victorian *modus operandi*, but it has now become standard practice. The word “hardy” carries the weight of this history, and with regard to a style of gardening, it implies ornamentation of the landscape with trees, shrubs, and perennial flowers that can be grown without any special protection. Coincidentally, the term evolved around the same time that rock gardening was becoming popular; but landscaping with hardy plants is not rock gardening; rock gardening concerns itself with more specialized matters.

A few years after the *Alpine Garden Society* was formed, the pendulum swung back to the “rock” contingent with the formation of the *Scottish Rock Garden*

Club and the American Rock Garden Society. Perhaps these new organizations used “rock” to emphasize their independence from England. They really had no further choices, for, ambiguous as it is, there is no other term understood to describe this style of gardening.

There is something to be said in favor of this ambiguity: it is both inclusive and exclusive. North Americans (and maybe Scots) may find the word “alpine” more limiting than “rock.” “Rock garden” is exclusive in that those who believe gardening mostly involves buying annuals in the spring and spreading a few bags of mulch will never, ever comprehend the universe that can be seen through the lens of rock gardening. They’re unlikely ever to join the club. The term is inclusive because, to the cognoscenti, it encompasses the whole world: the entire planet is rock. The English flower gardener digging manure into a perennial border, the Midwestern farmer plowing a cornfield, or the backyard gardener digging a hole for a rosebush may never understand that the soil they are working with is but a tiny layer upon a gigantic lump of rock.

If one is interested in growing plants from all over the world, or in one genus in all its forms, or one type of ecosystem as it exists in various places, or the wild plants from near one’s home, then one has to get used to the term “rock gardening.” I hope that you proclaim unapologetically that you are a rock gardener. It’s probably not worth the effort to explain it, though, if you’re talking to someone who doesn’t comprehend the breadth that the word “garden” encompasses.

Years ago, I was attending my first NARGS Winter Study Weekend. Morris West, Rose Wolford, and I were eating a snack in a coffee shop near the hotel when a young man with drug-dilated eyes tried to attract our attention. Finally, oblivious to our pointed attempts to ignore him, he approached us and asked why we were visiting town on such a wintry weekend. We said that we were attending a gathering of rock gardeners. “Oh, wow!” he exclaimed. “You mean . . . man, you mean, you’re all *musicians*?”

Nicholas Klise gardens with Morris West in Red Lion, Pennsylvania. Both are founding members of the Mason-Dixon Chapter of NARGS. An earlier version of this essay was first published in the newsletter of the Mason-Dixon Chapter.

Plant Portraits

Townsendia condensata

RICK LUPP, Graham, Washington

For those of us who live in parts of the world with very wet winters, *Townsendia condensata* is one of the plants that tell us at just one glance that we will never succeed in growing them in the open garden. This plant even requires a good bit of care to grow it well under cover—but what an extraordinarily beautiful sight it is when well grown!

This issue's cover subject, *T. condensata* forms rosettes of spatulate leaves covered with white, woolly hairs. The rather large, daisy-like flowers can be either white or lavender, and they sit right down in the foliage on very short stems. *T. condensata* is found in the wild at high elevations, growing in screes in Idaho, Montana, Wyoming, Utah and on the southwestern edge of the Great Basin in the White Mountains of California.

I grow *T. condensata* in a very lean mix with a high percentage of pumice. Grit can be substituted for the pumice with equally good results. I site the plants where they will get a good dose of afternoon sun and excellent air flow near the entrance of one of my hoop greenhouses. I let the pots become very dry before I water them in the winter, and then I take care to keep water off the foliage. Watering is best done on a sunny or windy day. Irrigation is not so critical during the growing season, when I water them in the same manner as my other plants but not too heavily. Even with the best of care, you will find the plants to be short-lived, but they do produce lots of seed that germinates well.

Cyclamen purpurascens

GERALD R. FIRAK, Park Ridge, Illinois

Among the winter-hardy *Cyclamen* species, clearly the most cold-tolerant here in the Midwest (where winter lows can reach $-20^{\circ}\text{F}/-28^{\circ}\text{C}$) are *Cyclamen purpurascens*, *C. hederifolium*, and *C. coum*. I've found that *C. coum* starts flowering in our

Midwest false springs, which occur in late February or early March, and then the temperature drops dramatically and remains low for weeks, spoiling the floral show. This problem is compounded by the snow's disappearing during the thaws, exposing the flowers to winter's second round.

Cyclamen hederifolium tubers are not hardy enough when our winters are snowless and bitterly cold. In addition, this species resents summer watering when grown among plants that need it, such as rhododendrons, which must be irrigated here from July until the first frost.

After growing these two most recommended species and becoming dissatisfied, I fortunately found *Cyclamen purpurascens*. I began with the plain-leaved Fatra form, ordered from a West Coast nursery, but I planted it in compacted, poorly drained soil and it consequently failed. The next year I bought several plants with the typical patterned leaves and set them in slightly elevated, highly organic, very well drained soil, where they prospered, flowered, and set much seed (photo, p. 25).

There is little solid advice in the literature concerning the culture of *C. purpurascens*, which is native to central and western Europe. In my experience, however, it can be summed up as follows. Grow it in shade and in organic, well-drained soil in a raised position; although I have some growing on flat sites, they must have good drainage. The tubers react badly to cold, wet winters, suffering bacterial rot, and do better when frozen all winter long. Water them when necessary in summer. If you have purchased them in pots (the only good way to buy mature cyclamen plants), plant them in a shallow depression, not at the 10-centimeter depth recommended by some books. The depression will fill in gradually; as the tuber matures, it will expand upward, and after 5 or 6 years its top will be above the soil surface. Don't worry about it freezing—just about the squirrels. Don't try to move a plant that has been in one spot for several years. I have tried and failed several times. However, seedlings transplant very well during the first two years after germination.

I also grow the Limone (Lake Garda) form, which occasionally produces silver-leaved plants. The silver-leaved forms are especially vulnerable to slugs and not as vigorous as the typical leaves, which are dark green with slight gray spotting. Silver ones are also shy bloomers, but very much worth growing, because with cyclamen it's not all about flowers: leaves count too. The Limone form can produce the most beautifully patterned leaves, which send the gardener off to the house for the camera. A word of caution: seed from your finest leaf forms can't be guaranteed to produce exact duplicates. *C. purpurascens* is highly variable, and bees will help generate a good mix of patterns too.

After failing initially with the Fatra form, I tried again with the correct culture. Frankly, it's just a plain-leaved form from Slovakia. I examined plants of this form at the botanic station in Blatnice, Slovakia, and found no differences between their flowers and those of other forms. There seems to be no difference in ease of growth, either.

Norman Deno's *Seed Germination Theory and Practice* recommends a fairly elaborate schedule of alternating warm and cold temperatures, which I've tried. It

was satisfactory, but if you're patient, you can raise seedlings with less trouble. Soon after the seed capsule ripens (in early July here), place the seeds equidistantly on the surface of a pot of good-quality soilless seed medium, cover with grit, plunge the pot in well-drained soil (a sand bed would be good), and cover it with screen to keep out birds and squirrels. Some seeds will germinate by September, and by the next July the pot will be brimming with young plants.

Around the last week of September, I tease out the yearlings and pot them up in 3.5-inch pots, then place them under lights in my basement with a 14-hour daily light period. By March some will be flowering, and by mid-May or earlier, I'll be planting them out in the garden. While they're under the lights I water them from the bottom, which can be laborious but avoids bacterial rot. Using this continuous growing method, you can compress about 3 years of maturation into about a year and a half. *Cyclamen purpurascens* blooms from early August to the first snows of November, and you can't get much better from a perennial than that!

Iris setosa subsp. *canadensis*

TODD BOLAND, St. John's, Newfoundland

There is often confusion over the proper identification of many plants, especially those that have widely divergent forms. Such is the case with *Iris setosa* subsp. *canadensis* (photo, p. 27). This small iris is very easy in cultivation, at least in more northern areas. The plant is bone-hardy, rated to USDA Zone 2. Full sun and moist soil are its simple requirements. In older literature, it was called *Iris hookeri*, since the original herbarium specimens were collected by Sir Joseph Hooker in some remote coastal area of Newfoundland. (There is a Himalayan species in another section, *Iris hookeriana*, and the names are sometimes confused, especially in seed exchanges.)

Other forms of *Iris setosa* exist that are much taller plants, not so well suited to rock garden settings. Overall, *Iris setosa* has a distributional pattern that extends from Alaska through eastern Siberia and south to Japan, as well as an isolated population in northeastern North America. I was quite surprised at the 2001 Eastern Winter Study Weekend when Jim Fox showed a slide of a drift of *Iris setosa* growing wild in Alaska. The plants were quite tall with arching leaves and exhibited a range of blue shades on branched flower stems—nothing like the *Iris setosa* I am used to.

I grew up with the subspecies *canadensis*, locally known as the beach-head iris because it is a common seaside plant all along the coast of Newfoundland. Besides the Island of Newfoundland, this subspecies may be found along southern coastal Labrador, less commonly along the Gulf of St. Lawrence regions of Quebec and New Brunswick, and south along the Atlantic coast from Nova Scotia to northern Maine, where it is relatively rare. In its normal range, it typically grows within reach of the ocean spray (not necessarily so with the Alaskan and

Siberian forms) on peaty headlands or peaty-sandy shores, usually in acidic soil. This subspecies is remarkably consistent in color: medium blue-purple with a whitish blotch near the base of each fall. The leaves are mostly erect. The unbranched flower stems, never exceeding 2 feet (60 cm) in height and often much shorter, each carry 1 or 2 flowers. I've have never seen any in Newfoundland higher than a foot (30 cm), and some were no taller than 4 inches (10 cm).

In my garden, I grow this iris in regular garden soil to which extra peat has been added. The plants have been inadvertently limed occasionally, to no ill effect. In Newfoundland, they bloom from late June to mid-July (probably late May to early June in areas with warmer springs). They quickly sulk if they get too dry.

In the nursery trade I have seen *Iris setosa*, *Iris setosa* subsp. *canadensis*, *Iris setosa* 'Dwarf Form' and *Iris setosa* 'Nana'. I suspect that the 'Dwarf Form' and 'Nana' are simply selections of subsp. *canadensis*. Plants I saw offered at nurseries in Calgary, Alberta, looked remarkably like the form that grows locally in Newfoundland. If you grow seeds listed as just *Iris setosa*, however, the result may be tall, somewhat gangly plants more suited to a bog garden. If you get the real subsp. *canadensis* or one of its named counterparts, you will be rewarded with a delightful dwarf iris, suitable for the most discriminating alpine enthusiast.

Editor's Note

Interested in *Iris* species? The Species Iris Group of North America (SIGNA) issues an informative newsletter and features a seed exchange, awards, slide library, Internet photo site, and several additional publications. Dues are US \$9 individual, \$10 household for one year, \$24/\$25 for three years, payable to SIGNA care of Rodney Barton, Membership Secretary, 3 Wolters St., Hickory Creek, TX 75065-3214. The photo site is at <<http://www.badbear.com/signa>>.

Books

The Genus Paeonia, by Josef J. Halda, with notes on cultivation by James W. Waddick. Illustrated by Jarmila Haldová. Portland: Timber Press, 2004. ISBN 0-88192-612-4. Hardcover, \$34.95. Available from NARGS Book Service.

Reviewed by JOHN GRIMSHAW, Maidenhead, England

A book on peonies may seem to be “off topic” for rock gardeners, but the wild species are among the horticultural elite of plants, valued by all good plantsmen. The smaller species, such as *Paeonia corsica* (as Halda suggests we should now call *P. cambessedesii*) and *P. clusii*, are eminently suited to the choicest of rock gardens or even pots for showing, while the larger herbaceous and woody species fit perfectly with the choice herbaceous plants most of us also grow. These are not the mophead cultivars, but the dainty single-flowered species whose charm frequently lies in their evanescence—plants to admire for a few days each year, to make pilgrimage to, much as the Japanese revere their fugacious iris, cherries, and, indeed, peonies.

Wild peonies are sadly little grown in even the best gardens. They are not easy to come by from the normal horticultural outlets, taking too long to grow from seed, or being too slow of increase to make them economically viable for most nurserymen. It is the true plantsperson who will take the time to grow them from seed, enjoying the slow build-up of stately foliage until flowering size is reached. Though the flowers may be short-lived, the foliage is among the finest in the garden, and the fruits that follow are often worthy of Fabergé in their arrangement of blue-black seeds and red sterile seeds. For those of us who grow species peonies, the shortage of information available on them has been a considerable problem, and a good book on them is long overdue.

The Genus Paeonia is Josef Halda’s answer. It is a very personal account of the genus, written from many years’ experience in tracking down almost every species in the wild, and studying them in herbaria and in cultivation. After introductory chapters providing useful background material, the bulk of the book is given over to accounts of each *Paeonia* species (and the related genus *Glaucidium*). Each account gives the various synonyms that have been applied to that

species (and there are usually several, since plants of horticultural interest often attract names for minor variants), a botanical description, notes on the wild range of the plant, and a "Comment," usually discussing the plants that the Halda have seen in the wild or collected seed from (the annual Halda seed list has been one of the important sources of seed for wild peonies). I found this comment section rather unfulfilling, as it is in this slot that I look to find out more about the plant than is conveyed in a botanical description.

As I said, this is a very personal account, and reading it one could well assume that nobody else has an interest in wild peonies. It is extraordinary, for example, that the Species Peony International Network, a vibrant group, is not mentioned at all. There is a good deal of debate on peony taxonomy in the current literature, but this has not been taken into account. Reading around the subject prior to writing this review I came upon the following anecdote, recounted by Dr. G. L. Osti in *The New Plantsman* (1.4, 1994), an enthusiast for whom a woody peony is named. He asked a group of eminent botanists how the status of a plant—species, subspecies, variety—was determined, and got the response "when an authoritative botanist says so."

"What happens if two authoritative botanists disagree?" was the next question. The reply was "Then there is a learned discussion between the two authoritative botanists." In *The Genus Paeonia*, there is no such learned discussion; the taxonomy is according to Halda, without the objective analysis of other opinions that one expects from a serious botanical review. For publication in a learned journal, peer review is essential; why not for a book? The taxonomy of peonies requires modern methods of analysis for resolution, and for this we are still waiting, but Halda's treatment of many formerly defined "species" as subspecies or synonyms seems very reasonable.

I have long held the maxim that if I find a statement in a book that I know to be wrong, the rest must be looked at with suspicion. I, and no doubt others, who have been growing *Paeonia suffruticosa* subsp. *ostii* (Halda's name; syn. *P. ostii*) for several years, either from seed direct from Dr. Osti or as plants imported from China, will find the statement that it has not yet been introduced to the West rather odd, as is the assertion that the plant formerly known as 'Joseph Rock' has been valued for "over a century," when it was introduced in 1926.

The plates by Jarmila Haldová, which form a colorful feature throughout (thank goodness!) the book, will be admired by many, but try as I might I cannot like them. They seem rather heavy, and to me fail to convey the silken elegance of a peony flower, and they lack the accuracy and detail desirable in a true botanical illustration. The lack of scale is troublesome, as some species are illustrated at life size, others larger or smaller, but only by reference to the descriptions can one find this out. However, the line drawings, also distributed throughout, are rather beautiful. The arrangement of leaves on the plates is draftsmanship worthy of the sixteenth-century master of wood engraving, Otto Brunfels, and the designs have more than a suggestion of William Morris. Good illustrations of the fruits, seeds, and roots of various species are useful. What I really miss is an indication of what the plants actually look like when growing. A flower and

upper part of a shoot do not convey this, and surely a case could have been made for including photographs of the plants in gardens and especially in the wild, to complement the artwork. Likewise, distribution maps would be useful.

The layout of the book is pleasant. It is a good size, the pages are uncramped, and the horrid, cheapskate arrangement of a central block of pictures has been dispensed with, thanks to the sponsorship of the Heartland Peony Society, a body that has admirably supported the work through to publication. I understand that many of their members wished to buy two copies, one to use and one to cannibalize for framing the illustrations, which explains why the color plates are printed single-sided, with the name on the obverse side—a feature that can be confusing where two color plates appear in succession, and the caption of the precursor faces the plate of the successor.

The second part of *The Genus Paeonia* is a lucid disposition on “Growing Peony Species,” by Jim Waddick and Josef Halda, that dispels many of the myths about the difficulty of growing these plants, especially from seed. A species-by-species guide to cultivation requirements is most valuable. The notes on availability in commerce are all too often rather sad comments on non-availability, but perhaps this will be reversed by the interest that this book is sure to engender. The book closes with a list of sources of plant material and information, a short glossary, and a bibliography that curiously overlooks, as suggested above, a number of modern contributions to the literature. The index is minimal.

In conclusion, this is a book that all lovers of wild peonies will not want to do without, but as I said, a better book is still overdue.

Wildflowers of Wyoming, By Diantha States and Jack States. Mountain Press Publishing Company, 2004. 256 pp., 363 color photographs. Paperback, \$19. Available from NARGS Book Service.

Reviewed by RICHARD A. WEIGEL, Portland, Oregon

All wildflower identification guides must strike a balance between portability and comprehensiveness, between accessibility for nontechnical readers and botanical rigor, and between affordability and the number and quality of color photographs. *Wildflowers of Wyoming* positions itself as a portable, economical volume aimed at the amateur wildflower hunter.

Both authors hold advanced degrees in botany and live in Wyoming, so they possess the credentials and experience necessary to write a credible wildflower guide to the State. Their goals—as put forth in the introduction—are “to provide readers unfamiliar with plant identification an easy-to-use field guide” and “to write a book that included the common wildflowers of the six major vegetation zones in Wyoming.” For the most part, they succeed in both efforts.

This book is an easy-to-use guide that will enable anyone to identify the most common wildflowers associated with the six major Wyoming vegetation zones: plains, steppe, foothills, montane, subalpine, and alpine. The authors include a

number of useful features that simplify identification. The inside back cover contains both a printed ruler and a handy guide to leaf types, shapes, and arrangements. And in the front of the book, the authors include a two-page breakdown that describes and illustrates identifying characteristics of sixteen plant families. This breakdown is followed by a five-page drop-down key to plant families. Thus, even if readers are not able to identify a particular plant, they should at least be able to identify its family.

The handiest feature of the book is a six-page section of photo thumbnails arranged by petal color and type that enables the reader to determine easily and quickly the page numbers on which the plant is likely to appear. The larger plant photos in the main identification section are, on the whole, adequately composed and properly exposed. Only a few seem to have been taken under unfavorable conditions (e.g., bright midday sun, a windy day, or too great a distance from the subject). As a result, nearly all the photos avoid the dismayingly common problems of many field guides in which the flowers appear too washed out, too blurry, or too tiny to facilitate identification. In addition, the accompanying descriptions of plant families and species are clear and satisfyingly detailed.

My major complaint is that the book sacrifices depth for breadth. Trying to cover all six vegetation zones forces the authors to picture only a few species for each genus. For example, only seven of the forty-plus species of *Penstemon* and only two of the nine species of *Anemone* that occur in Wyoming are pictured and described. Thus, if a hiker happens upon any but the most common species of any wildflower, he or she will not be able to identify it definitively.

I can't fault a book for being exactly what its authors designed it to be, but I find guidebooks that concentrate on the flowers of a particular life zone more useful than those as broad-based as *Wildflowers of Wyoming*. If I'm hiking in the mountains, I prefer a book that specializes in mountain wildflowers; on high desert or plains, I want one that emphasizes the flora of those areas. This guide, therefore, seems best suited for Wyoming drivers who want to store a quick general reference in their glove compartment. Flower hunters with any level of botanical sophistication beyond the most rudimentary will want to use a field guide written for the area they are frequenting.

Wild Lilies, Irises, and Grasses: Gardening with California Monocots

edited by Nora Harlow and Kristin Jakob. Berkeley: University of California Press, 2004. 58 photos, 74 drawings, map. Hardcover \$50, paperback \$24.95.

Reviewed by DIANA CHAPMAN, Arcata, California

Although the horticultural industry has been slow in promoting the planting of species native to the western United States, native-plant nurseries are now finally springing to life throughout the state of California. The growing demand for native species reflects our increasing awareness of the loss of our natural her-

itage through agriculture, development, and urbanization as we try to reestablish, in our own tiny landscapes, some semblance of what is rapidly disappearing.

Until now, there has been a shortage of literature focused on the growing of plants native to the West, particularly the native bulbs and grasses. *Wild Lilies, Irises, and Grasses* not only fills this void, but also fills the reader's senses with its elegant format and stunning artwork by Kristin Jakob.

No attempt has been made in this book to cover all the western species. Instead, the authors have made a careful selection of those bulbs, grasses and xerophytic plants, such as agaves and yuccas, that are both beautiful and adaptable enough for gardeners with average skills to grow in the West. After a brief editorial introduction explaining the definition of a monocot and the differences among bulbs, tubers, corms, and rhizomes, the various contributors tackle the task of describing the selected species. The book is organized into three main sections: "Bulbs and Bulblike Plants," "Grasses and Grasslike Plants," and "Succulent and Xerophytic Plants." The descriptions are clear and concise, with the needs of each individual species so clearly spelled out that successful growing is almost a certainty. In the back of the book is a glossary of botanical terms, as well as an excellent table showing site preferences for the species covered. In addition, there is a list of display gardens, as well as sources of seed, plants and bulbs.

The book is liberally sprinkled throughout with excellent photographs, but the highlight for me is Kristin Jakob's black-and-white illustrations, often gracefully embracing the text, or sometimes seeming to float off the page. Words are not adequate to describe the delicacy and grace of Kristin's art—it has to be seen for itself. To be able to capture the beauty of these lovely plants without the use of color is truly remarkable. It is obvious that the editors have given considerable attention to the layout of the book, using an attractive font for the text, and carefully balancing the text with the photographs and illustrations.

It may seem churlish to criticize such a lovely book, but a few minor mistakes have crept in. The *Erythronium* crosses that produced the cultivars 'Pagoda' and 'Kondo' are between *Erythronium tuolumnense* and *E. californicum* 'White Beauty' (a Carl Purdy selection that increases vegetatively quite vigorously, unlike the wild form of *E. californicum*). *Calochortus coeruleus* received its misleading name (meaning "blue") because dried herbarium specimens have a bluish tint, but fresh specimens look like small, very hairy *Calochortus tolmiei* without a hint of blue. Most of the species selected are indeed easy to grow, but one might question the inclusion of *Calochortus macrocarpus* which requires extremely dry conditions and does not fare well in the garden outside its native Columbia Plateau. Finally, the rather terse entry for *Sisyrinchium douglasii* (now correctly called *Olsynium douglasii*) does not do justice to its beautiful, large purple flowers.

Whether your interest lies in botany, native gardening, or botanical art, this lovely book deserves a place in your library. Thirty years in the making, and with a roll call of contributors that reads like a *Who's Who* in the world of native bulbs, it has finally fulfilled a dream. The contributors and the editors, Nora Harlow and Kristin Jakob, are to be congratulated for their staying power, and for the excellence of this outstanding book.

2004

Photo Contest Results

Although the 2004 entry was smaller than that in 2003, the overall quality of the photographs submitted was very high, and the judges worked hard. The Honorable Mention category below contains many images that were in contention for top prizes. Some winning photos appear on pp. 29–32, and more will be published throughout the year.

Many thanks to the excellent photographers who contributed. Their work will appear throughout the 2005 volume of the *Rock Garden Quarterly*. First prize in each class receives a one-year gift membership in NARGS to a person of their choice; the Grand Prize is a fine book of garden photography.

This year, first place winners included at least one from each of the three media—print, slide, and digital. Although slides continue to dominate in the list below, studio-quality prints and good digital photos (those with high resolution, good depth of field, and natural colors) are quite competitive.

Instructions for entering the 2005 contest will appear in the spring issue. Start choosing your best photographs!

This year's winners:

Grand Prize:

Jim McClements, Dover, Delaware, *Helleborus thibetanus* (first, Class 3)

Class 1, Portrait of a plant in the wild

1. Doris Taggart, Kirkland, Washington, *Leucogenes grandiceps*
2. Tanya Harvey, Lowell, Oregon, *Epilobium siskiyouense*
3. Yoko Arakawa, Kennett Square, Pennsylvania, *Physaria alpina*
4. Doris Taggart, *Gentiana divisa*

Honorable mention:

Yoko Arakawa, *Eriophyton wallichii*

Kath Baker, Llanarthne, Wales, *Crocus veluchensis*

Tanya Harvey, *Allium crenulatum*, *Erythronium hendersonii*, *Cornus canadensis*,

Drosera, *Tonestus lyallii*

Ruth Happel, Issaquah, WA, *Ipomopsis aggregata*, *Lewisia rediviva*

Denis Hardy, Muir of Ord, Scotland, *Oenothera xylocarpa*
 Dianne Huling, E. Greenwich, RI, *Veratrum viride*, *Dudleya*, *Paronychia*
 Jay Lunn, Hillsboro, OR, *Astragalus purshii*, *Lewisia pygmaea*, *Eriogonum caespitosum*, *Eriogonum compositus*, *Eritrichium nanum*
 Jack Muzatko, Pinole, CA, *Lewisia kelloggii*
 Dick Redfield, Scotland, CT, *Hymenoxys grandiflora*, *Douglasia montana*, *Campanula piperi*, *Eriogonum aureus*
 David Sellars, Surrey, B.C., *Androsace alpina*
 Margaret Taylor, Storrs, CT, *Aquilegia jonesii*
 Stefania Wajgert, Zabierzow, Poland, *Soldanella*
 Ev Whittemore, Penrose, NC, *Aquilegia jonesii*

Class 2, Plants in a natural landscape

1. David Sellars, *Trollius europaeus* in the Dolomites
2. Tanya Harvey, view of Boreas Pass, Colorado
3. Jay Lunn, scree in White Cloud Peaks, Idaho
4. Doris Taggart, *Aciphylla congesta* on Mt. Burns, New Zealand

Honorable mention:

Yoko Arakawa, *Primula sikkimensis*, Bhutan; *Castilleja miniata*, Colorado
 Kath Baker, *Crocus veluchensis* in Pindos Mountains
 Ruth Happel, *Lewisia rediviva*; *Lewisia tweedyi*, Washington
 Tanya Harvey, Coffin Mountain; Cone Peak
 Dianne Huling, Hoosier Pass; Loveland Pass; Bodega Bay
 Jay Lunn, *Hymenoxys* in White Cloud Peaks
 Dick Redfield, *Erythronium grandiflorum* on Snowy Ridge; Mojave Desert; Eklutna Flats; Mt. Sefton, NZ
 David Sellars, alpine plants in British Columbia, *Androsace* in Dolomites, *Eritrichium nanum* on cliff

Class 3, Portrait of a plant in cultivation

1. Jim McClements, *Helleborus thibetanus*
2. Dick Redfield, *Adonis vernalis*
3. Jon Evans, Farnham, England, *Colchicum speciosum*
4. Stefania Wajgert, *Pulsatilla vulgaris* 'Papageno'

Honorable mention:

Kath Baker, Llanarthne, Wales, *Dionysia bazoftica*
 Jon Evans, *Aptosimum*, *Romulea bulbocodium*
 Gerald Firak, Park Ridge, IL, *Cyclamen purpurascens*
 Denis Hardy, *Ramonda nathaliae*
 Frances Howey, London, ON, *Talinum pulchellum*
 Dianne Huling, *Mesembryanthemum congestum*, *Primula denticulata*, *P. juliae*, *Arisaema sikokianum*
 Jim McClements, *Disporum megalanthum*, *Erythronium japonicum*, *Asarum campaniforme*, *Claytonia virginica*
 Jack Muzatko, *Eriogonum* (2 photos), *Dudleya nesiotica*

Dick Redfield, *Trillium grandiflorum*, *Adonis amurensis*, *Iris humilis*, *Gentiana scabra*

David Sellars, *Aquilegia bertolonii*, *Saxifraga* 'Ariel', *Saxifraga grisebachii*

Margaret Taylor, *Saxifraga* 'Foster's Gold'

Stefania Wajgert, *Gentiana angustifolia*, *Physoplexis comosa*, *Campanula sartorii*,
C. saxifraga, *Dianthus sylvestris*, *Draba polytricha*

Class 4, Rock garden scene

1. Dick Redfield, Cottrell garden, Christchurch, New Zealand

2. Jack Muzatko, Waterfalls at Kew, England

3. Dianne Huling, Hay Estate, Newbury, New Hampshire

4. Tanya Harvey, Harvey garden

Honorable mention:

Dianne Huling, Betty Ford Alpine Garden, Colorado; Herold garden

Dick Redfield, planted wall

David Sellars, Sellars garden

Margaret Taylor, Sonoran Desert Museum, Arizona

Stefania Wajgert, Wajgert garden and pond

Ev Whittemore, Whittemore tufa garden

In Memoriam: Dick Redfield

Richard W. Redfield, a member of NARGS for 45 years and a mainstay of several chapters, died at age 89 on October 4, 2004, in Scotland, Connecticut, where he had lived and gardened since retiring in 1974 from his career in brokerage and banking. He is survived by two nieces, three grandnephews, and a grandniece.

Dick Redfield spent the earlier part of his life in New Jersey, where he cultivated his first rock garden at age 12. His early interests included dwarf conifers and rhododendrons, as well as the native plants of the New Jersey Pine Barrens, the southern Appalachians, and Alaska. His gardens are described and illustrated in his article "From Closter [N.J.] to Scotland—A Tale of Two Gardens" in the *ARGS Bulletin* (35(2), spring 1977, 77–82).

Elected secretary of the national Society (then ARGS) in 1967, he served five years. He was a member of the national Board of Directors in 1972–1974. In 1974 he was elected vice president, an office that had been chiefly honorary until that time, but Dick became the first "working" V.P., serving until 1976. He also held various offices in regional chapters, particularly Hudson Valley, Connecticut, and Berkshire.

He received the ARGS Award of Merit in 1974. In 1989 the Connecticut Chapter gave him the Service Award, citing him as "a superb plantsman, an excellent speaker and photographer . . . a creative gardener whose garden of carefully selected and beautifully grown choice herbaceous and woody plants was open for visits. Many of his plants have graced our show benches and enriched our treasury through sales." His service to the Berkshire Chapter was recognized with a Service Award in 1993, and in 1995 the New England Chapter honored him with the Walter F. Winkler Award.

Over much of his life Dick traveled widely, often with his brother, Herb, viewing and photographing alpine plants. Many issues of the *Quarterly*, including this one (p. 29, 32), feature his photos, which combine the knowledge of a plantsman, a technical photographer, and an artist. Recently he was an enthusiastic contributor to the journal's annual photo contest, receiving the grand prize in 2003. He used the photos in lectures to chapter and national meetings and for several articles in this journal.

Dick Redfield was an exemplary presence in NARGS: a creator of a beautiful garden and grower of choice plants shared with others; an educator and entertainer of his lecture and reading audiences; an explorer of the world of alpine plants; and a dedicated worker for the Society. Contributions in his memory may be made to the Garden Conservancy (P.O. Box 219, Cold Spring, NY 10516).

Based in part on A History of the American Rock Garden Society, 1934–1995, by Marnie Flook, NARGS Archivist.



Xerophyllum tenax, drawing by Baldassare Mineo



NARGS COMING EVENTS

Annual Meeting: July 14-17, 2005, "Newfoundland and Labrador: Rock Garden of the North Atlantic." Host: Newfoundland Chapter, Holiday Inn, St. John's, Newfoundland. Registrar: Bodil Larsen, 141 Lower Rd., Outer Cove, NL A1K 4B7, Canada; <blarsen@mun.ca>; info: <http://www.nfldrockgardensociety.homestead.com/Introduction.html>

Eastern Winter Study Weekend: January 28-30, 2005, "Ontario—Multicultural." Host: Ontario Chapter, Toronto Airport Marriott, Toronto, Ontario. Registrar: Norm & Lynne Limpert, RR #1, Acton ONT L7J 2L7, Canada; (905) 878-1243; <limps@sympatico.ca>

Western Winter Study Weekend: February 25-27, 2005, Host: Northwestern Chapter, Everett, Washington. Registrar: Alice Lauber, 18922 45th Pl. NE, Lake Forest Park, WA 98155; <aelauber@juno.com>

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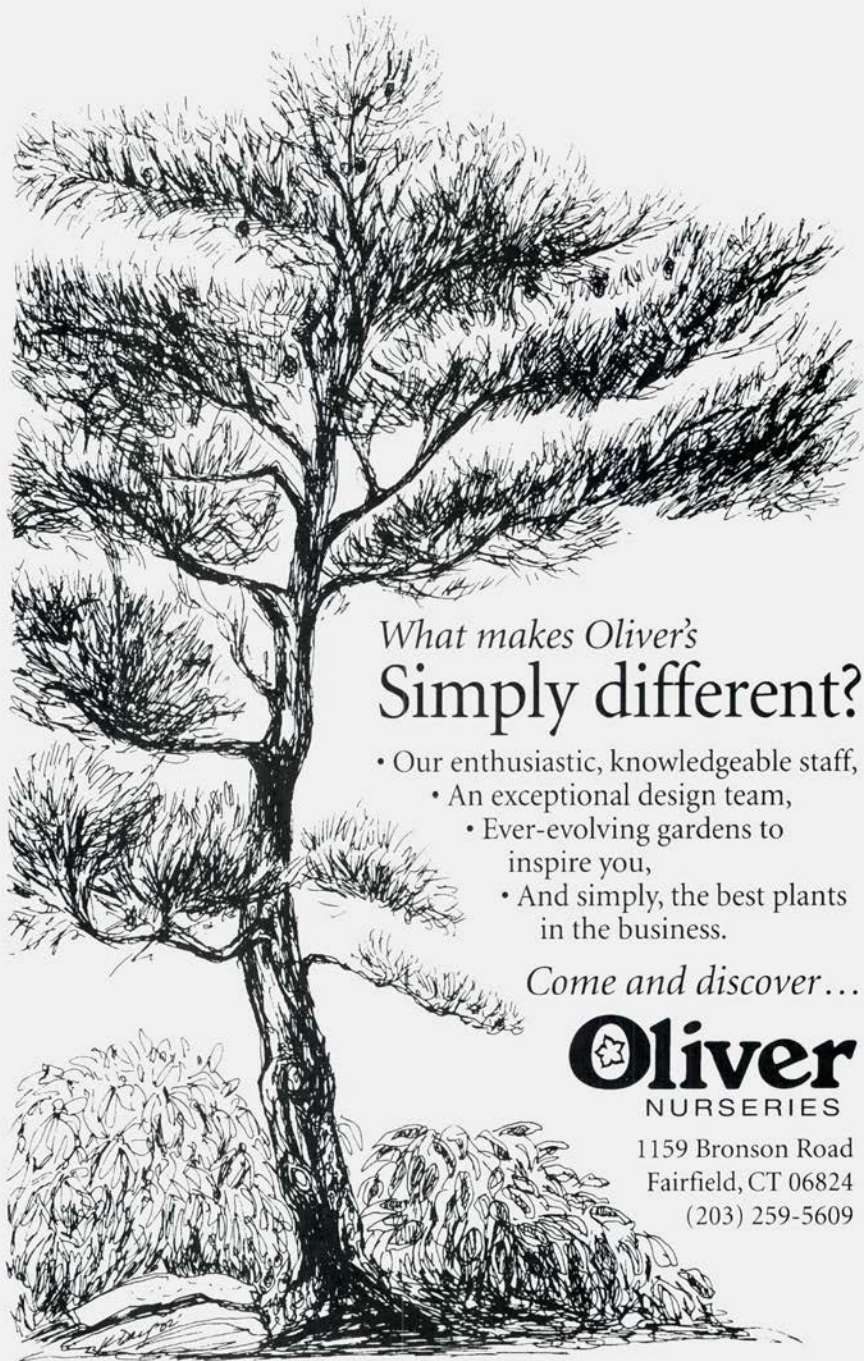
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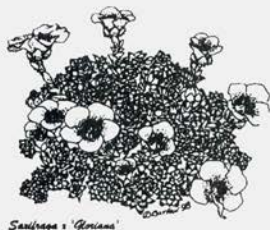
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REVIEWED IN THIS ISSUE

Wildflowers of Wyoming, Diantha States & Jack States. Field guide to wildflowers common to Wyoming. Dichotomous key. Arranged by family with color photographs for identification. 254 pp.\$15.00

The Genus Paeonia, Josef J. Halda and James W. Waddick. Botanical illustrations by Jarmila Haldová. Documents 25 species and 40 subspecies and varieties. Also includes genus *Glaucidium*. Information on growing with an account of soil considerations, hardiness, propagation, and diseases and pests. Stunning botanical paintings. 227 pp.\$28.00

COMING THIS SPRING FROM TIMBER PRESS

Consult the Timber Press website, www.timberpress.com, for additional details.

Witch Hazels, Christopher Lane. Introduction to *Hamamelis* with detailed descriptions of species and hybrids. Info on how conditions affect rate of growth, size of plant, leaf retention, and flower color. 264 pp. Due February\$28.00

Plants from the Edge of the World: New Explorations in the Far East, Mark Flanagan and Tony Kirkham. Entertaining travelogue illustrated with color maps and photographs that will appeal to travelers and plant lovers with an interest in the rich flora of the Far East. 312 pp. Due March ..\$32.00

Seeds: The Definitive Guide to Growing, History, and Lore, Peter Loewer. Blends science and hands-on experience while addressing the concerns of seed raisers and collectors. Advice on buying, storing, germinating, soil and transplanting. 240 pp. Due March\$15.00

The Nature of Plants: Habitats, Challenges, and Adaptations, John Dawson and Rob Lucas. Explores plants' adaptation to the challenges of their habitats. Plants that use other plants, the love-hate relationships with animals, and the hidden associations with bacteria and fungi. 314 pp. Due April\$32.00

Heucheras and Heucherellas: Coral Bells and Foamy Bells, Dan Heims and Grahame Ware. Background on the wild species and their development into the selections and hybrids of today. 220 pp. Due May\$22.00



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