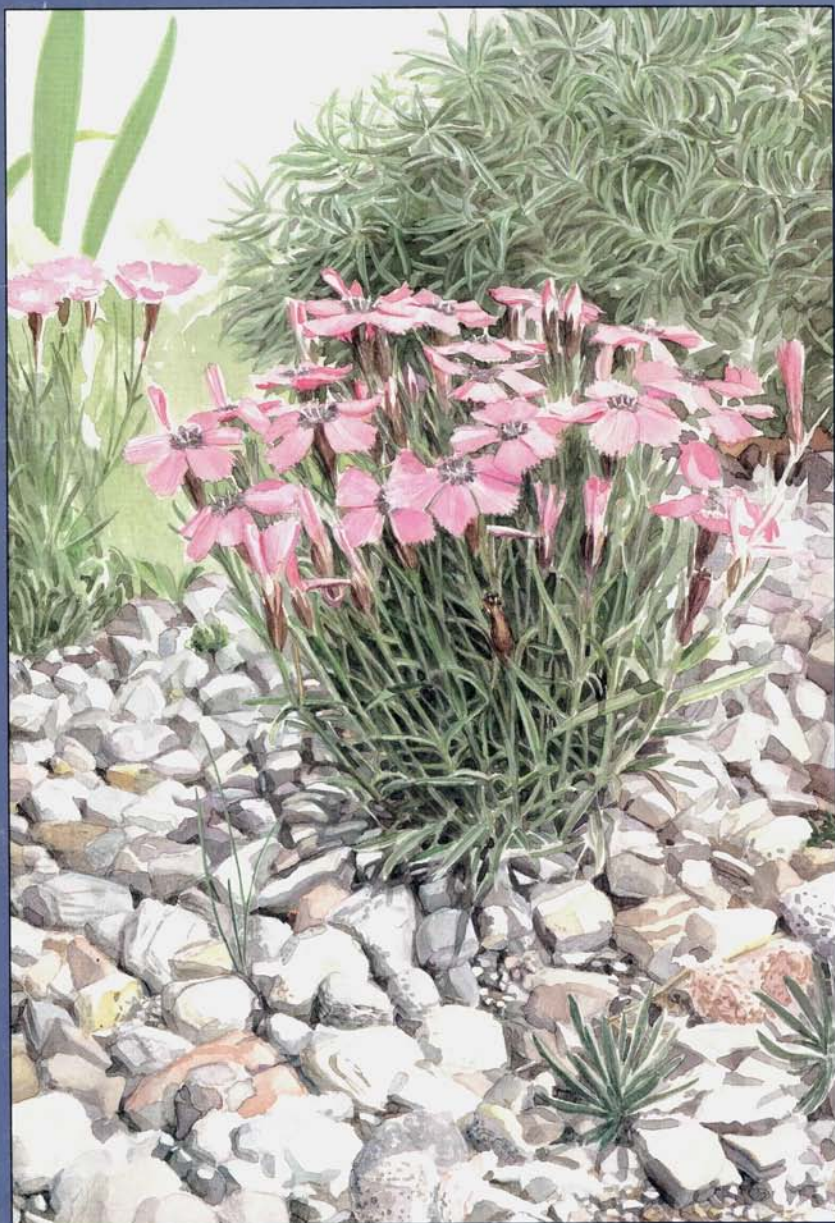


# ROCK GARDEN



## QUARTERLY

VOLUME 54 NUMBER 2

SPRING 1996

COVER: *Dianthus nitidus*

by Paul Martin of Golden, Colorado

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# ROCK GARDEN

## QUARTERLY

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# UPLANDS

## LIFE AMONG THE ALPINES

by Catherine Hull

**R**ock gardening is a spell: once you succumb to it, there is seldom any turning aside from the passionate love of small, wild things. There is no point pontificating or preaching—it swoops you up, or it leaves you cold.

Do you choose gardening, or does it choose you? I thought I had chosen to make a perennial garden, first in a suburb of Washington, D.C., and later in a small town north of Boston. Then one day I saw from a friend's window a wild mountain poppy growing in a crevice of rock, the orange flower, no bigger than a small butterfly, moving gracefully with every breath of air. Instantly I dropped the idea of a lush herbaceous border and began a love affair with wild things, especially those that grow high in the mountains, called alpines. Soon I joined the American Rock Garden Society. At my very first meeting, held at the foot of Mt. Washington, the principal speaker was Lincoln Foster, the guru of all rock gardeners. Then and there my gardening life changed forever. A very strenuous future stretched before me.

Happily, my conversion followed closely the purchase of our new home. The property is on a hill a hundred

feet above sea level looking out to Massachusetts Bay. The landscape architect Fletcher Steele had designed a small upland garden here in the 1930s. He made a wisteria arbor with stone columns, a border of hybrid tea roses and clematis along a narrow lawn, a goldfish pool with a full-size statue of Neptune presiding at one end, and a long border of rhododendron and laurel.

My only previous gardening experience had been in backyards where I had struggled with double digging to incorporate better soil and compost. But here, one thrust of a shovel and CLANG!—a rock! It was soon obvious that the hill was literally solid granite with only a thin skin of soil. No hole deeper than four inches could be dug except in the middle of the lawn. (We later learned that Steele had imported truckloads of loam to create that lawn.) But at last there was a reason for rock—a wonderful reason: rock plants.

My first efforts began on an island in the driveway where a granite ledge underlies a rather thick growth of trees—pines, hemlocks, oaks, and some Japanese maples planted in

Steele's time. By clearing a section of ledge and filling depressions and pockets with the basic rock garden mix of leaf mold, topsoil, and sharp sand, I made a setting for a small rock garden. It was intensely satisfying to have my first love, alpine poppies, grow from seed and do well in the company of some other easy-to-please low plants such as *Dianthus* and *Iberis*.

This early success led me next to the long-overgrown border of rhododendron and laurel near the lawn. Lincoln Foster had said that if he had to create a space to grow rock plants, nothing could compare to the planted wall. It seemed wise to follow his advice, all the more because a rock wall was available: it supported the rhododendron bed that lay along a walk Steele had planted with flowering dogwood. The trees could provide the high dappled shade needed for the wall's southern exposure. I felt no compunction about removing the old laurel and rhododendron; they had been aging unhappily for reasons that became evident when they were dug. The soil they lived in was desiccated and pale, with no possibility of moisture retention, hardly deserving the name of earth.

The stones in the existing wall were round and unattractive; it was a bonanza to find a tumbling wall of well-weathered granite field stones at the foot of the hill. I must have been the despair of the skilled masons doing the job, insisting as I did that the lichened side of any rock be turned outward and that they pack between the stones the special mix I had prepared. They were able to fill the whole depth of the old laurel-rhododendron bed with newly mixed soil suitable, we hoped, for a stony scree for mountain plants. In nature, scree is the loose rock debris found at the base of large rock masses or left behind on slopes

by the movement of glaciers. To create it artificially in a raised bed one needs deep underpinnings of small stones or rubble. We put in well over a foot, then sandwiched in some leaves or hay to prevent the finer soil mix on top from sifting down.

I had been gathering small plants from specialist nurseries and from friends' coldframes, and I had also grown some from seed. Many of the smallest were inserted between the stones on the face of the wall; others were placed on top in the prepared scree bed. The plants were mulched with at least two inches of gravel or stone chips to keep the roots cool and protect the leaves from soil spattering.

Soon after the granite wall and raised bed were completed, plants were flourishing. The backbone was provided by small conifers and shrubs, such as *Daphne*, both *D. cneorum* 'Eximia' and *D. alpina*, *Leiophyllum buxifolium* var. *prostratum*, and the nearly prostrate *Vaccinium macrocarpon* 'Hamilton'. The loveliest of all was *Kalmiopsis leachiana* 'Umpqua Valley', propagated by Alfred Fordham at the Arnold Arboretum. *Lewisia*s were soon thriving, as were small saxifrages and an *Asperula nitida* ssp. *hirtella* (or *A. n. puberula*, as it is often known), recently collected by an explorer in Turkey; androsaces sowed themselves—in short, it was gorgeous. So much so that I wanted more wild plants, not only from mountain peaks but from bogs and woodlands as well.

With a book in one hand and shovel in the other, I tried to dig a bog, succeeding in getting down only about 4-5" before striking granite. I dutifully followed the book's instructions to line the designated bog space with several layers of plastic and to fill it with dampened peat laced with a small amount of sand, although as the years go on I realize that the layer of ledge

alone would undoubtedly have kept the moisture in. Not everything in that spot is a bog plant, but *Helonias bullata*, *Saxifraga pensylvanica*, *Primula denticulata*, and *Cardamine pentaptyllos* do well.

Along paths Fletcher Steele must have planned many years ago we added woodland plants, among them both the single and double *Trillium* and *Sanguinaria*, *Clintonia*, *Primula*, *Erythronium*, *Arisaema*, and ferns. In a fairly open area near an old hemlock we planted *Glaucidium palmatum*, which has become one of the showiest early spring bloomers and an enormous favorite. Below a low rock cliff by the lawn we planted one of my best-loved ferns, a maidenhair, *Adiantum venustum*, and above on the level shelf of rock a single *Dodecatheon media* 'Album', which has self-sown and created a community. *Gentiana scabra*, the Japanese fall gentian, behaved the same way, colonizing the cliff. A few *Claytonia virginica* planted early on have made a wonderful white spring carpet for the shooting stars—a serendipitous result.

Euonymus and ivy groundcovers, thoroughly entrenched, had been planted by Steele as "maintenance free" for his client in the 1930s. When we pulled them away, some good natives appeared as if released from jail. The most exciting was *Erythronium americanum*, which continues to spread, with considerable bloom in early spring. A few patches of *Anemone quinquefolia* came to life and have been hopping about ever since.

Little by little, the garden was being extended. We made a dwarf rhododendron collection on raised islands—homes for cuttings from Polly Hill's North Tisbury hybrid azaleas and for a few crosses made by Lincoln Foster at his garden, Millstream, in Falls Village, Connecticut. Other ericaceous

plants came back with us from trips to England and Scotland, along with many plants for the rock garden's scree.

Not all the effort was expended on the upland garden. We had been in the house only a few weeks in the fall of 1967 when one night we heard the sound of rushing water outside. Early the next day we thrashed our way downhill through the dense growth of brush and trees and found a stream struggling through thickets of alders. Had the gods read my wish list? A stream had always been near the top, but neither the real estate agent nor the former owner had ever mentioned one. Our discovery triggered vast efforts to clear the alders, deepen the channel, accentuate the rocky waterfalls, and create a few pockets to hold water even in summer.

The desire to see the stream from the house helped us confront the 40 years' growth of briars, poison ivy, nettles, wild grape, and unwanted trees on the hillside—the growth that comes after land has once been cleared and is reverting to its natural woodland state. Oak, beech, and ash had been strangled and stunted by the competition. In these days of raised ecological consciousness, it is considered wicked to call any natural state a horticultural nightmare, but we had to come to terms with this tangled wilderness in order to let in more air and light, to widen the view of the ocean at the upper level, and to make paths down the hill and up again.

For several years, my husband and a succession of college students pulled and cut. I followed with salt-marsh hay and piles of newspapers (we haven't thrown one out for 28 years). There may be better ways to discourage unwanted vegetation, but I can only report on what we did here. The biodegradable paper and hay are

adding a richer, deeper soil quite rapidly. Of course, much that is unwanted gladly seeds in, but so do more welcome volunteers.

I still needed more space for my growing collection of alpine. Where could I make another bed with sufficient light, away from the shade and the drip of trees, preferably with a northern exposure? The answer was the ailing rose and clematis border. My attempts to make those plants happy had been a complete failure. The roses were leggy and had blackspot. The clematis were supposed to climb only 16" to the top of the dressed-slate retaining wall, then lie down flat and show glad faces to an admiring audience sipping tea on the terrace above. But it didn't work that way for me. In spite of my teasing and training the vines along a horizontal trellis on top of the wall, there was more wilt than bloom. Once again, plants were dug out for anyone wishing to take them.

I had been hearing more and more about tufa—that calcareous rock, very porous, pocked with holes and narrow tubes. It was our great good fortune to learn of an estate where a cache of tufa—treasure to rock gardeners—was unwanted by the owners. They let several of us take away all we could carry. With that unexpected windfall we soon had an Aladdin's supply in all shapes and sizes.

Fortunately, the rose and clematis bed was at the edge of the long lawn Fletcher Steele had made with imported soil, so it was possible to dig. At about 2' down we poured in bags of vermiculite, as I had read of its ability to hold moisture under a large raised bed. Next we added lavish loads of gravel and sand; then assorted-sized pieces of tufa were embedded in a long series of mounds of prepared soil. Soon after this pudding was complet-

ed and some plants put in, the elements took a hand. The result was a sunken soufflé: I had made the mix too rich in humus, with too much peat and leaf mold. So I began again and belatedly listened to advice from others. We buried cinder blocks along the edge near the lawn to support the largest base pieces of tufa and instead of a soil mixture used only coarse sand to position the other pieces with occasional chunks of granite wedged underneath to hold them in place. A 4" layer of the regular rock garden soil mix was topped with 2" of stone mulch to give the plants a start. They responded with the usual euphoria of young plants in fresh soil in settings to their liking.

Soon alpine poppies blazed over the long bed and saxifrages settled in, as did *Aethionema oppositifolium*, *Androsace*, *Hutchinsia alpina*, some penstemons, dianthus, and *Erinus alpinus*—making a pleasant mosaic of small plants colorful in May and early June. Many of the small ferns took gladly to the tufa, and I have had much better luck with *Adiantum pedatum* var. *subpumilum* (often known as *A. p.* var. *aleuticum*) and *Asplenium trichomanes* in that porous rock than in the granite. *Cystopteris bulbifera* forma *crispa* has taken a very determined and welcome hold. The happiest combination may have been a small pink *Erigeron compositus* endemic to the Wallowa Mountains in Oregon and *Gentiana acaulis* grown from seed. The past tense applies to that companionship, as the large gentian gave up after a season of 24 blossoms; young gentians have been planted to see if they can recreate the good years. There are small shrubs: *Salix arbuscula* and *S. hylematica*, *Tsusiophyllum tanakae*, *Daphne arbuscula* (indigenous to the Tatra Mountains), *Ulmus parviflora*, *Ptilotrichum spinosum* 'Purpureum',



and others to provide a different interest and change of texture. Certainly some plants self-sow too vigorously, and others fade quietly away, but on the whole the tufa bed still gives us great pleasure.

You seldom see a rock garden without dwarf conifers. The high mountains have only occasional wind-bent stems or twisted trunks above the tree-line, but in a garden landscape more persistent punctuation is needed, some backbone for small plants. A little difference in eye level is welcome as one looks at the scree, raised bed, or wall, and a conifer's dark green color and shape help accentuate the plants around it. *Juniperus*, *Abies*, *Picea*, *Tsuga*, *Chamaecyparis*, all are useful and present in various sizes in our tufa and granite beds. Many of these so-called dwarf conifers proved eager to become giants and had to be moved down the hill, where they are now anchors of dark green or steel blue in all seasons.

My education as a rock gardener has proceeded slowly over the years. It is curious to see what remains constant in one's affections and what begins to pall. And startling how hard some lessons are to learn. It is painful to realize that not all the plants you love stay with you long. Enormous help came to me from courses at the Arnold Arboretum, and I wish I could have taken others at the New England Wild Flower Society. One acquires books along the way—I started out reading them like detective stories—and there are answers from the experts who lecture at seminars, clubs, and plant societies. The North American Rock Garden Society is a constant source of help, of plant sales and swaps, and of seeds. The contagious zeal of all plants-people is a never-ending propellant.

One of the A-B-C lessons I have been shamefully slow in absorbing is

the continually changing nature of a garden. Some plants have a tendency to move out from the place where they have performed beautifully and seek new ground. I am thinking, for instance, of *Primula kisoana*, the special color form that Dr. Rokujo in Japan sent to Lincoln Foster. It made a striking splash over a yard wide by a woodland path for years, then began to meander all over, leaving a blank space behind. Many plants that don't wander away or die simply become weak images of their former selves.

The scree bed in the granite wall has been in need of rejuvenation for several years, and piecemeal efforts have not produced much improvement. I am seeking solutions to avoid the upheaval a total rebuilding would require. I have allowed some biennials too much license: *Symphyandra hoffmannii* has been a lusty invader, *Scabiosa lucida* another. For a while *Phyteuma orbiculare* was a threat. Honesty (*Lunaria annua*) and rocket (*Hesperis matronalis*) are all over the place. After battling briars and poison ivy, such comely takeovers seemed almost welcome, but the day of reckoning comes relentlessly: digging and renewing the soil and replanting are urgently needed.

When I tire of working with tiny seedlings in a small corner of the granite scree or tufa bed, I plunge downhill. There I can thrash around, cutting back dock, overzealous daisies, and exuberant goldenrod; plant some of the taller *Penstemon* species, *Perovskia*, *Anemone*, different forms of *Digitalis*, varieties of *Cimicifuga* and *Rodgersia*, and other plants I like. I am not sure yet whether I regret introducing some of the ornamental grasses. Many of them can become monstrously large and difficult to move.

Scattered over the hillside are shrubs, such as *Fothergilla*, both *F. major* and *F. gardenii*, *Viburnum*,

*Daphne*, *Syringa meyeri* 'Palibin', *Heptacodium miconioides*, *Vaccinium*, *Lespedeza thunbergii* and others. We are planting only small trees and individual specimens, among them *Acer triflorum*, *A. griseum*, *Cornus kousa*, various forms of *Stewartia*, and a *Chionanthus retusus* collected by members of the Arnold Arboretum staff on the Sino-American Expedition in 1980.

In spite of the clearing and cutting of our early years here, only about one-third of the hill is in full sunshine. The most shaded areas are being encouraged to grow different species of ferns as well as lots of *Cimicifuga*, *Epimedium*, *Vancouveria hexandra*, *Alchemilla mollis*, *Aruncus*, and much else. Some of the ferns—the ostrich (*Matteucia struthiopteris*) is one—are adopting a belligerent tone, marching fiercely up the hill. *Asarum europaeum* and *Waldsteinia ternata* are taking hold along the edges of paths, and many other plants have been moved down from the woodland garden where they had multiplied beyond their space.

Schools of thought on gardening are continually changing, just as gardens themselves do. One of the most observant writers, Mac Griswold, has said that gardeners want to know if it's possible to restore the environment and have a garden, too. There is even an outcry in some places against doing battle with slugs, chipmunks, and woodchucks. It takes a tremendous mental wrench to perceive their presence as anything but invasive; in fact, it is more than I can do in parts of the garden. Is a favorite plant to be lost because it is caviar to a chipmunk or just what the slug was waiting for? Is it to be struck from our list because it is not native? I am sorry that the environmental crisis has thrust guilt on some gardeners. Can it be lifted where plants are concerned and channeled instead onto the matter of overspray-

ing with pesticides and herbicides and the overuse of chemical fertilizers?

One environmental theme can hardly be contested—the one praising compost. For lack of loam and soil on our property we have turned compost-making into a homescale industry with cinder block bins in an out-of-the-way spot and a shredder to speed up the process when there is time to use it. Every fall and spring the shredder is in heavy use chopping up the autumn crop of leaves and coping with those left behind in spring as well. These leaves are used for surfacing the paths, for mulch, for compost. The bins are like the canisters on a kitchen shelf, in which flour, sugar, and salt are stored; here there are bins for leaves, horse manure, sand, gravel, weeds, seaweed, and sheep and cow manure when we can get it. When shredding time or strength run out in the fall, we pile unshredded leaves in a large wire bin, the first of three, so that in three years there is compost of a rough sort for general use in the woodland and on the hillside. This has been done unscientifically, without additional inoculants, letting nature do the work.

Wheelbarrows and trash barrels are indispensable parts of our gardening efforts—a wheelbarrow is taken to the various bins and individual ingredients put in by the bucketful, the choice of which bin and how much depending on whether the mix is for woodland plants in shade or for plants on the open hillside. For the rock garden the mix is made more fastidiously with only leaf mold (mainly oak, since that is our principal tree) and helpings of peat, occasionally manure, and ample amounts of sand and bags of granite chick grit to provide good drainage.

—continued p. 145

# ROCK GARDENING

## IN THE CARIBBEAN

by Richard R. Iversen

Mountains—Alps, Dolomites, and Rockies—inspire temperate rock gardens. Gardeners try to recreate these montane environments in miniature, so that they can grow the diminutive alpine plants that inhabit them. Some are successful. However, many fail to mimic the natural world and end up as rocky horror shows. As fond as I am of mountain tops and the flora that grows upon them, rock gardens often leave me cold!

So it is to my surprise that I've become enchanted with rock gardens in Barbados, especially those Iris Bannochie began at Andromeda Botanic Gardens some 30 years ago. However, they make no pretense at imitating mountain summits. Alpine re-creations would be grossly inappropriate in a climate where coconut palms and banyan trees grow in ceaseless heat and steamy air. Here, rock gardens are adornments to the coral-stone outcrops that are so much a part of the Barbados landscape. Plants grow directly upon the rocks; botanists call them epilithic. Roots penetrate the rock itself.

Porous coral limestone is the bedrock of most of Barbados. It is

weathered into flat surfaces and steep-sided ravines and gullies. Millennia ago large blocks of stone broke from the edge of the coral cap and slipped down eastward to the Atlantic coast, creating what we call today the Scotland District. Rubble of large and small coralstone boulders exists. Here lies Andromeda Botanic Gardens.

Andromeda meanders alongside giant, fossil-encrusted coral boulders that sweep down a steep hillside. Rock outcrops form its backbone, harmoniously linking one area to another. The outcrops provide rhythm and unity, and in many places are focal points. The garden is named Andromeda after the mythological maiden who, like this landscape, was chained to a rock.

Since the Caribbean rock garden isn't emulating a mountain top, side, or scree, the plants growing within it generally aren't native to mountain environments, either. They tend to be xeriphytes, succulent plants adapted to sunny, hot and dry, calcareous locations. Many are old favorites, boyhood plants I knew from the shelves at Woolworth's in New York—*Aloe*, *Haworthia*, *Kalanchoe* and *Sansevieria*.



Some succulents, like *Haworthia* from South Africa, are diminutive and fulfill the temperate rock garden aesthetic for dwarf plants. The common zebra haworthia, *Haworthia fasciata*, is only 3" tall. Thin leaves are only one half-inch in diameter. Its common name foretells its horizontal white stripes. The rosettes of stiff leaves, congregating into small colonies, show more resemblance to sea urchins than zebras!

Other plants become large, bold, and brassy. They command attention and defy rules of proportion and scale. A world of whimsy begins to develop throughout Andromeda Botanic Gardens. Agaves 5' in diameter crown rocks 2' in diameter; 6'-tall cacti top rocks only 1' high. The 15", triangular leaves of *Kalanchoe beharensis*, firm, yet soft as plush velvet, are the antithesis of jagged stones from which these plants arise. Pairs of leaves are

arranged each at right angles to the one below it and look bizarre on 6—12'-tall stems towering above my head.

*Agave americana* is a rigid, upright plant of great prominence, perhaps better suited to rigid, upright containers than to rugged coralstone terrain. However grown, they become part of the garden architecture. The thick and leathery, strap-like, silvery-blue leaves can surpass 5' in length. Three cultivars offer yellow stripes. *Agave americana* 'Marginata', the most common, has leaves edged in gold. They twist and snake, then cascade down the side of upright containers or ancient coralstone boulders that serve as their pedestal.

*Agave americana*, American aloe or century plant, hails from dry Mexican deserts, where it survives in barren soils with little water. It tolerates lots of neglect. When it receives good cultivation—a soil of sand and loam with rapid drainage—speedy growth occurs. Plants often flower in less than a century. Hot, sunny climates produce amazing, symmetrical stalks, 20' in height with greenish-yellow blossoms, in fewer than 10 years. In less favorable climates gardeners must wait 50, 75, or 100 years. After flowering the plant dies. However, the profuse formation of basal "pups" ensures the agave its place among the rocks.

*Agave americana* has one liability, a dangerous, stiff spine about 2" in length that arms the apex of each leaf. Eye goggles must be worn when gardeners are working around agaves. In public gardens and private ones where children roam the tips should be pruned off.

*Aloe* species are less audacious than agaves. Among the multitude that

exist, virtually every size category is represented, and they cling well to the rocks. *Aloe arborescens* is tree-like, as its name suggests, with a woody stem sometimes 12' tall but usually nearer 3' at Andromeda. Leaves have prickly margins, and from their bases spikes emerge, and the red flowers open during winter months.

The 1-2'-long, fleshy leaves of the herb *Aloe vera* (syn. *A. barbadensis*) are magical. Their sap is a favorite home remedy for burns and insect bites. This plant is common and suitable for rockeries, although it was first grown here in large field pits for export to London druggists. Ever since early colonists brought it to Barbados, it has been a favorite.

*Sansevieria* is now my favorite genus. Most people know them as snake plant or mother-in-law's tongue. My Aunt Gertrude was too superstitious to allow one in her home. However, thousands of windowsills in temperate climates are home to handsome specimens of *Sansevieria trifasciata*.

I first purchased the dwarf *Sansevieria trifasciata* 'Hahnii' at a summer church sale in New York State's Adirondack Mountains when I was seven or eight years old. The 6" foliar rosette was growing in a large coffee cup that had a face of felt. The golden foliage cultivar *S. trifasciata* 'Golden Hahnii' is as brilliant as a black-eyed Susan and is always in blossom. The tolerance of *Sansevieria trifasciata* to many growing conditions makes all its cultivars good candidates for the coralstone rockery. Dozens exist.

Spiky, cylinder-shaped leaves, about 3-5' long, of *Sansevieria cylindrica* are elegant. On one rock at Andromeda spears of *Sansevieria cylindrica* rise above domes of *Agave attenuata* to pro-

vide a vivid contrast. Their thick rhizomes slowly creep along the rough coralstone surface, finding craters in which to send down roots.

*Sansevieria kirkii* is the jewel of the genus. A handsome, flattened rosette of stiff, yet wavy, leaves is marbled in shades of olive, charcoal, and a hint of salmon-pink. Old plants become vertical sentinels and command considerable respect.

Some gardeners say pot-bound plants of the desert rose, *Adenium obesum*, grow best in gritty soil. These handsome, succulent shrubs, 3-6' tall, have thick, twisted, fleshy stems. Glossy leaves appear from short branches during the wet season, then fall during periods of intense drought. Despite its good form and foliage, it is for the 3" symmetrical flowers, brilliant carmine-red, that the desert rose is grown. Two plants of *Adenium obesum* grow into the rocks at Andromeda



Botanic Gardens, and we plan to add many more!

Many native Caribbean species, like *Jatropha podagrica*, gouty foot, are at home on the rocks. *Jatropha*, a tropical, succulent herb, belongs to the large family of spurges, Euphorbiaceae. Twelve-inch, shield-shaped leaves are deciduous and drop during the dry season to expose a grotesquely swollen and gnarled stem or caudex. At Andromeda plants self-seed in the coralstone nooks and crannies. We also transplant small caudices into preferred locations. Within six months they are up and growing.

I love the albino form of *Euphorbia lactea*. Its white, ghostly skeleton is quick to attract attention and awe. Small bones from the 'Ghost Cactus' (it's actually not a cactus at all) will send roots directly into coralstone crevices that hold a bit of soil. Soon the space has spirit!

Not all rock garden species bask in full sun. Damp boulders found in shady gully bottoms provide habitats for the Barbados native epiliths *Peperomia magnoliifolia*, *Anthurium wildenowii*, and the maidenhair fern, *Adiantum tenerum*. I lay peperomia rhizomes along rock fissures or places where they look "natural" and lightly cover them with an organic compost. When kept moist, they root in place.

It is hard for a once-temperate gardener like myself to believe that the beautiful yet fussy maidenhair could ever sporulate so much as to become a weed and need removal. Yet sometimes it does! The breadfruit fern, *Polypodium aureum*, must be carefully monitored for weediness. Without control, sporlings soon completely hide the rock that supports their growth. *Pilea microphylla*, the artillery plant, is a weed that needs continual removal by pulling the base of the stems with tweezers.

Gesneriads like the red-flowered flame violets, *Episcia cupreata* and *Episcia reptans*, and their cultivars flourish and flower when grown on damp rocks in slightly shady environments. Not only do they creep around, they self-sow—but never invasively. Mature plants quickly establish when carefully nestled in rock crevices. *Saintpaulia rupicola*, an African violet, likewise grows on rocks in its native Kenyan habitat.

Recently, we planted a new *Anthurium* glen, enclosed by boulders, at Andromeda. The waxy-red hybrids are omitted to make room for some of the many wild species with bizarre and beautiful foliage. Many of these plants, like *Anthurium salviniae* with massive 5' leaves and *Anthurium crystallinum* with silvery-white venation upon large, shimmering, emerald-green leaves, are epiphytic or epilithic. Now they live among the rocks. The scene is splendid, exotic, and primitive; not the quintessential alpine rock garden. And that's what makes these rock gardens so enchanting!

It is easy to create a Caribbean rock garden where boulders already exist on a property. First, search for microenvironments, small places within the rocks that will support plant growth. Natural fissures or depressions on the stone's surface become the pots for the plants. If no niches can be found, chisel holes into the rock. Fill them with a soil mix—clay loam and gravel. Now comes the fun. Choose your favorite plants, then learn new ones, and create a rocky fantasy show!

Richard Iversen gardened at Andromeda Botanic Gardens in Barbados. He has now returned to his native Long Island. Photos by the author.



*Solidago hispida* (p. 98)



*Rubus acaulis* (p. 99)

*Salix cordifolia*

*Salix vestita* (p. 99)

photos, Todd Boland





Limestone barrens, Belburns, Newfoundland

photos, Todd Boland

*Cornus suecica* (p. 99)







Cape Norman (p. 98, 99)

photos, Todd Boland

*Loisleuria procumbens* (p. 97)





*Potentilla crantzii* (p. 99)

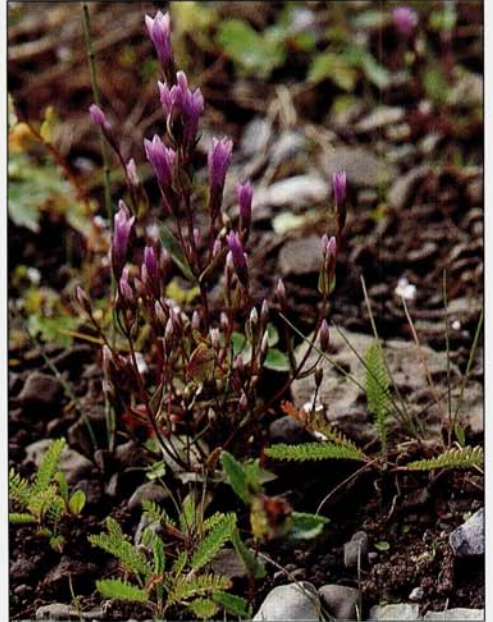


*Potentilla fruticosa* (p. 99)  
photos, Todd Boland

*Cypripedium calceolus* var. *planipetalum* (p. 99)



*Gentianella propinqua* (p. 99)



# ROCK GARDEN PLANTS OF NEWFOUNDLAND

by Todd Boland

When most people think of alpine plants, visions of the majestic Rockies, Alps, or Himalayas come to mind; after all, many of our cultivated alpinists are natives to these mountains. But what about alpinists that naturally grow at sea level? Such an image does not fit the normal definition of "alpine," a plant growing on top of a mountain. In fact, it seems to be a contradiction in terms.

Newfoundland is Canada's easternmost province. Despite the fact that the island is on the same latitude as France, our climate is more like that of Norway. The reason for this is that we are cursed (from a gardener's point of view) with the cold Labrador Current. This ocean current brings Arctic waters (including Arctic ice) south to Newfoundland. Even in southern areas of the island, the cold Arctic water effectively postpones spring until May or June. Throughout summer, the temperatures remain fairly moderate, averaging around 22°C. Luckily, in St. John's, our capital city, winter does not arrive until December, and the winter temperatures are relatively mild, with a mean of about -3°C.

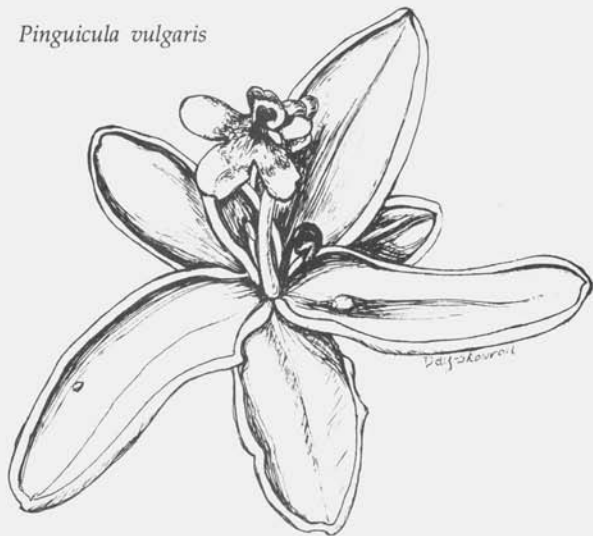
However, winter arrives early in

our northern coastal alpine areas, usually in late October. By midwinter, temperatures are plummeting to -30°C. The ocean is ice-covered well into June. This keeps coastal temperatures quite cool with the summer maximums rarely reaching over 18°C. Wind is also a major factor; year-round the average wind speed is about 30 km/h. Keeping these climatic factors in mind, you can understand how Newfoundland alpinists can grow at sea level in this area.

Several of Newfoundland's native alpinists grow in typical alpine situations, notably on our Long Range Mountains. Perhaps the best known alpine area of the island is in Gros Morne National Park. On these granitic mountains grow *Phyllodoce caerulea*, *Cassiope hypnoides*, *Loiseleuria procumbens* (photo, p. 95), *Sibbaldia procumbens* and the beautiful, yet rare, *Diapensia lapponica*. However, our widest diversity of alpinists does not grow on mountain tops, rather, just above sea level!

Some of Newfoundland's alpinists are endemic to the island; others may also be found on mountain tops of Cape Breton Island in Nova Scotia and

*Pinguicula vulgaris*



the Gaspé Peninsula of Quebec. A surprising number are also distributed throughout the Canadian Rockies. And despite the fact that Newfoundland is about 2000 km south of the Arctic Circle, some of our alpiners are native to the Canadian Arctic. Newfoundland is the southern limit of the distribution of these arctic-affinity plants.

The sea level alpiners of Newfoundland are mostly distributed along the western and northern shores of our Great Northern Peninsula, from Gros Morne National Park north to Cape Norman (photo, p. 95). This region is characterized by relatively flat, limestone barrens. The landscape is virtually devoid of trees and at first glance appears as an expanse of jumbled, broken rock. But close inspection of this haunting landscape will reveal a surprisingly wide assortment of alpine gems. The flowering season begins in early June, peaks in early July, and may continue into early September.

Although there is a fair diversity of native sea level alpiners, they generally grow in one of three microhabitats.

The most tenacious grow embedded among the cracks in the limestone bedrock. These include *Epilobium latifolia*, *Sedum rosea*, several *Draba* species (*D. glabella* and *D. incana* are the most common), *Lesquerella purshii*, *Braya humilis*, *Oxytropis johannensis*, and our more dwarf endemic counterpart, *O. terrae-novae*. These last two species are the most noteworthy

since they bloom from late June until September, bearing abundant, deep indigo flower clusters.

Among the exposed bedrock are large areas of pebble-sized limestone gravel. This is a natural, almost level scree. Scattered in these areas are several attractive hummock-forming alpiners, including *Silene acaulis*, *Saxifraga oppositifolia*, *S. aizoides*, *S. caespitosa*, and rarely, *Armeria maritima* var. *labradorica* and *Diapensia lapponica*. The *Diapensia* prefers acidic rocks but does make an occasional appearance on limestone. The thrift is sporadic and mostly on limestone. A few mat-forming alpiners also inhabit the scree areas, including *Arenaria rubella*, *A. humifusa*, *Erigeron hyssopifolius*, *Minuartia dawsonensis*, the silver-leaved *Antennaria parviflora*, *A. umbrinella*, and *A. eucosma*, and finally, *Cerastium alpinum*. Rarely, you may find the extremely hairy form of *C. alpinum* known as the variety *lanatum*. Other attractive scree alpiners are *Viola labradorica*, *Solidago multiradiata*, *S. hispida* (photo, p. 93), and *Senecio pauperculus*. Scattered along seepage areas

in the scree grow our three native species of primrose. *Primula laurentiana* is the most distinguished species, with relatively large clusters of lilac flowers and heavily farinose leaves. Unfortunately, young or starved plants may be confused with *P. mistassinica*, which dwarf *P. laurentiana* closely resembles. Our third species, the diminutive *P. egaliksensis*, has white flowers and efarinose leaves.

Shrubs also grow in these gravels, albeit very dwarf forms. Common shrubs include Arctic willow (seven species of *Salix*), *Potentilla fruticosa* var. *tenuifolia* (a prostrate form, photo, p. 96), *Betula pumila*, *Shepherdia canadensis* var. *prostrata*, *Arctostaphylos alpina*, and white mountain avens (*Dryas integrifolia*). Of the arctic willow species, *Salix reticulata* is one of the most attractive, having small, rounded, net-veined leaves with a metallic, purple-green sheen. *Salix vestita* (photo, p. 93) has leaves of a similar texture, but they are larger, lighter green, with characteristic silver-silky hairs on the lower surface. It only grows to 15 cm. *Salix candida*, known as the hoary willow, may

reach 1 m and has leaves felted with white on both sides. This makes it the most noticeable shrub of the coastal barrens. Although mostly confined to our serpentine mountains, very desirable specimens of *Rhododendron lapponicum* may be found scattered among the other dwarf shrubs.

Along much of the coastline of the Great Northern Peninsula the limestone barrens end abruptly as low cliffs, generally 3-6 m in height—although this drop may be over 30 meters in the Cape Norman region. At the base of these cliffs there often accumulates a band of peaty, gritty soil, a Shangri-La for many alpine.

By far the most attractive species along the cliff bases is the yellow lady's-slipper, *Cypripedium calceolus* var. *planipetalum* (photo, p. 96). This variety is endemic to northern Newfoundland and the north shore of Quebec. The plants are very dwarf, often under 15 cm, and have pale yellow, untwisted petals. This is quite distinct from the more common variety *parviflorum*, whose petals are very twisted and tinted mahogany. In local



areas, *Cypripedium calceolus* var. *plani-petalum* is so abundant that it is difficult to hike without stepping on them!

Overall, these coastal oases are a kaleidoscope of colors. Pink, purple, or blue flowers originate from *Pyrola asarifolia*, *Rubus acaulis* (photo, p. 93), *Viola palustris*, *Iris hookeri*, *Pinguicula vulgaris*, *Gentiana nesophila*, and *Gentianella propinqua* (photo, p. 96). White-flowered alpiners include *Anemone parviflora*, *Parnassia palustris*, *P. glauca*, *Polygonum viviparum*, *Cornus suecica* (photo, p. 94), *Stellaria longipes*, *Tofieldia pusilla*, and *Erigeron hyssopifolius*. Yellow-flowered *Potentilla crantzii* (photo, p. 96), *P. nivea*, *Alchemilla minor*, *Solidago multiradiata*, and *S. hispida* complete the picture.

These latter species are all quite common, but there are also some rare species which may be encountered in the right area. *Arnica chionoppa*, *A. tomentosum*, *Braya fernaldii*, *B. longii*, *Potentilla usticapensis*, *Crepis nana*, and the exquisite *Calypso bulbosa* are among these rarities.

The limestone cliffs, too, contain some treasures, such as the ferns *Polystichum lonchitis*, *Asplenium viride*, and *Cystopteris fragilis*, as well as several *Draba* species, the silver-rosetted *Saxifraga paniculata* var. *labradorica*, *Sedum rosea*, and the ubiquitous *Campanula rotundifolia*.

Over the years I have tried my hand at growing several of our native alpiners. Some have been a great success, others total failures. Whenever I collect native alpiners I always collect plants from soon-to-be construction sites, collect seed, or take cuttings. Too many of Newfoundland's wildflowers, alpiners in particular, are in serious danger due to over-exploitation.

One thing to keep in mind when growing collected native plants is the fact that growth forms can change dramatically once a plant is under cultiva-

tion. This happened with plants of *Sedum rosea* and *Iris hookeri* I collected several years ago near Point Riche. In the wild, both species grow approximately 15 cm tall, but after two years in cultivation, they both reached over 30 cm. On the other hand, I expected the shrubby cinquefoil to grow more upright once in cultivation, but the plants I collected from the limestone barrens appear to be genetically prostrate dwarfs.

As a rule, I have had less luck with taprooted alpiners. The fibrous-rooted species are generally easy and will even thrive in regular garden loam. Most of my native alpiners are growing in a mix of one part loam, one part peat, and one part three-eighths-inch chip stone. All but the true scree species do fine in this mix. Native *Antennaria* species become almost weedy under cultivation and require judicious thinning. *Sedum rosea* makes a bold statement with its beautiful bluish foliage (the flowers are of only secondary importance to the gardener).

*Silene acaulis* produces very tight buns, covered in pale lavender flowers from late May to early June. Our native form has small flowers (only 4 mm) compared with plants in the Rockies. On the other hand, *Saxifraga oppositifolia* has flowers almost twice as large as I have seen on plants elsewhere in the country. In my garden, this is in full glory by early May.

The goldenrods, *Solidago multiradiata* and *S. hispida*, are wonderful additions to any rock garden. The glossy, deep green leaves of *S. multiradiata*... contrast nicely with the globular flower heads. The entire plant reaches only 10-15 cm. *Solidago hispida*, with its hairy, gray-green leaves, produces dense, cone-shaped flower heads on stems that reach to 20 cm.

—continued p. 146

# A ROCK GARDEN

## IN THE CZECH REPUBLIC

by Josef Slegl

My friend Tony Liska lives in Decin, a town on the Elbe River in the northern Czech Republic. His house stands on the southern hillside of the Elbe Valley. Tony was once an active sportsman, and he loved to play water polo. About 20 years ago he was afflicted by a serious disease—the agent of infection was *Bacillus hortusplantae-saxorum*. Since that time instead of channeling all his creative power to sports, he has concentrated it in his new hobby—alpine and rock gardening.

The first signs of Tony's sickness were as follows. First his orchard and vegetable garden were deserted. Then he started to bring home stones. Tony's garden is not large, very small by American standards; if we don't count the paths and driveway it occupies about 150 sq. meters. But it consists of stony slopes. The first kind of stone used was the local, hard, fluoride-rich sandstone. Crevices between stones were constructed to be as small and tight as possible, and here Tony planted his first miniature alpiners. At the beginning he planted several quite popular conifers. Remaining from this time on the southern slope are

*Juniperus communis* 'Hibernica' and *J. virginiana* 'Sky Rocket'. But these quite ordinary conifers have been systematically pruned over the last 20 years and formed with thin copper wire; because of this, they are of very compact, monolithic, columnar shape. Here also is placed *Chamaecyparis pisifera* 'Intermedia' and *C. pisifera* 'Squarrosa dumosa', which by the same means were trained to quite globular and very compact shapes. In recent years Tony's passion has been concentrated more on very miniature conifers, including *Picea abies* 'Little Gem', the dwarf *P. glauca* 'Laurin', and others. A specialty is another dwarf which Tony named *Picea abies* 'Krnak'. It is planted in a pan and named after conifer enthusiast and gardener Josef Krnak, who found this form as a witches' broom in the forest about 30 years ago. Its annual increase is really very small, only as much as 2 cm. Its texture is irregular, and its relatively long needles remind one at first sight of a small pine.

There is always something in bloom in this part of the rock garden; the buns and tiny clusters of *Porophyllum saxifragae* and those of the *Xanthizon*

section bloom profusely, as do the choice smaller drabas and some selected smaller selections of phloxes. Later they are followed by tiny species of carnations, gentians, campanulas, and *Edraianthus*, as well as solitary plants used here and there, including some bulbous plants, such as *Tulipa* and *Fritillaria*. Here and there are rocks covered with colonies of *Sempervivum* cultivars.

Along the driveway on the opposite side, is a narrow strip of land, artificially extended by stones formed into a steep slope leaning against the wall. This north-facing slope has enough light for dwarf rhododendrons to thrive very well. In addition to the species *R. radicans*, *R. russatum*, *R. obtusum*, and *R. myrtilloides*, cultivars of *R. repens* and others such as 'Joseph Hill', 'Chikor' grow here. To my surprise ramondas, *Lewisia*, and several other alpiners are here as well.

The eastern yard, only about 5' wide, is covered by larger sandstone boulders. Here are many heathers, and the dominant plants are conifers and *Juniperus davurica* 'Expansa Variegata',

*Pinus leucodermis* 'Satelit', and *Abies balsamea* 'Nana'.

But Tony's main interest and passion is saxifrages. Although you can see such commoners as *Saxifraga cochlearis*, *S. paniculata* 'Minutissima' and *S. longifolia* in his garden, the main objects of his affection are the smallest species—porophyllums, formerly known as kabschias. He cultivates at present about 400 species, hybrids, and cultivars, of both European and Asiatic origin. They are everywhere, in crevices in the rock garden proper, in troughs, pans, and also in pots plunged in the sand of raised beds. This saxifrage passion engrosses Tony completely; each new plant that appears on the horizon highly excites him; immediately he searches for a cutting.

Recently Tony's new acquisitions are primarily the Himalayan species and their new hybrids and cultivars—and, of course, new results of hybridizing work of other Czech breeders. On his bench you will find long lists of *all* his saxifrages. Each new acquisition is very carefully prop-







agated by cuttings. In recent years he has also been growing seed of some species of the *Porophyllum* section in hopes of acquiring new and perhaps better cultivars.

As Tony's passion for alpiners increased and turned over time into an obsession, the rock garden underwent numerous reconstructions. The original hard sandstone suddenly seemed not to be good enough for more and more choice alpiners...and Tony had to purchase a trailer for his car and search for limestone tufa, a smooth travertine. The nearest locality for tufa is about 500 miles from home, but no effort and expense did he mind. The sandstone was gradually replaced by travertine—and he began to build up a higher wall. Each stone was handled many times and finally carefully placed—or changed for another. Holes and pockets were dug out of each rock. An automated watering system was built. The wall eventually reached a height of over 8'. At the top is built a miniature pool from which the porous tufa takes up water. On this wall there was found a place for the miniature *Pinus silvestris* 'Compressa' and for

what is perhaps the smallest spruce—*Picea abies* 'Pigmy'. All other sites on the wall are completely devoted to saxifrage; well, here and there a pocket has been permitted to some choice primrose or other highly esteemed plant.

As he has doesn't have an abundance of space, Tony uses every free spot in the garden, plus he plants his jewels into troughs and pans, and even into holes in solitary travertine rocks. In choice pans of earthenware and good pieces of tufa the plants require much attention and time. In this garden you see pans filled with travertine stones as well as with schists, harder sedimented limestone, or very porous volcanic tufa, all in accordance with the requirements of the chosen plants and with Tony's aesthetic view. There are pans and troughs everywhere—all full of plants.

He solved this problem in his own way, building up a vertical iron construction with shelves for more and more pans. Inside the construction are miniature pipes for automated watering, and on each shelf are very shallow aluminum dishes from which the pans

can take up water. Pans used are round, oblong, or elliptic, and in each are planted four or five kinds of saxifrages. Sometimes a miniature conifer is added. Here are a few examples of some plantings in these pans:

1. *Saxifraga x boydii* 'Sundance',  
*S. x petraschii* 'Kaspar Maria  
Sternberg', *S. x megaseaflora*  
'Dana', *S. x bertolonii* 'Berenica'

2. *Picea glauca* 'Laurin', *Saxifraga  
burserana* 'Lutea', *S. x edithae*  
'Bridget'

3. *Saxifraga stenophylla*, *S. x  
anglica* 'Cranbourne', *S. x  
megaseaflora* 'Karel Capek'

4. *Chamaecyparis obtusa* 'Nana  
Gracilis', *Draba bryoides* var.  
*imbricata*, *S. x anglica* 'Beatrix  
Stanley', *S. marginata* 'Minor'

In earliest spring, when the sun shines on the just-thawed ground, the garden sparkles like the richest jewelry. It is hard to choose where to look first. On the large, dark stones of volcanic tufa glisten the magenta flowers of the difficult *Saxifraga x kellereri* 'John Kellerer'; in sandy beds in 5" clay pots, where the collection of rarest and most difficult saxifrages is held, we see an ample spectrum of colors, the saxifrages accompanied by tiny carnations, various species of *Edraianthus*, *Campanula*, and even *Physoplexis comosa* or *Saponaria pumilio*.

Tony's enthusiasm and passion for everything miniature led him also to another kind of gardening—growing dwarf trees, bonsai. In his propagation beds we see any number of potted seedlings and rooted cuttings of conifers, evergreens, and deciduous broad-leaved trees that may over time be trained as bonsai. Perhaps each of these is trained from its early stages with the idea of planting it later into

some specific pan or tray. As the assortment of suitable pans and troughs on the market has not been satisfactory until now, Tony has made many contacts with people who produce ceramics and clay hardware to encourage them to amplify the spectrum of containers available.

When I last visited Tony, he was digging a huge hole near the garage. When I asked, he told me that this will be the Japanese garden. He explained some details of his plans: Until now running water is lacking in the garden, and there is not enough space for more bonsai. Thus the garage must be destroyed and more tufa brought in. Tony is looking for a typical Japanese stone lantern, he is preparing a new batch of plants, finding a pump for water, and acquiring many other necessities. In the next year, where the garage now stands there will be another miniature garden with a waterfall, more stones, miniaturized trees and shrubs, and new, choice miniature alpinists...

Tony Liska is a very kind man. We have travelled together to visit plants in their mountain homes. Each visitor to his garden brings home some plant or small tree. But be warned: *Bacillus hortus-plantae-saxatilis* awaits you wherever Tony is, and from him you can be easily infected, and doomed until the end of your life to search for stones, bring ever new plants home, and be plunged always into working with various soil mixes, constructions, and cuttings...

Josef Slegl suffers himself from the rock gardening disease and gardens in Decin, Czech Republic.

# TILDEN BOTANIC GARDEN

## MIDWINTER ADVENTURE FOR AN EASTERNER

by Jim Jones

The search for plants as they grow in the wild is a frequent topic in rock garden journals, often including daunting descriptions of local hazards braved. The articles, one might say, discuss two aspects of the experience: the journey and the goal. The journey takes in the total ambiance—heights, depths, leeches, whatever—while the goal, the basic reason for the whole exercise, is the delightful plants to be found in that locale. Now, it might seem hardly worth pointing out this dichotomy, so inseparable the two parts might appear to be, but, as I will show, under certain circumstances the latter can be attained with only the scantest nod to the former.

### Hold the Leeches

In contrast, say, to trekking through Nepal, the diverse flora of California can be sought out and enjoyed with relative ease and comfort (barring the odd earthquake, deluge, or lightning strike). But to do justice to the Golden State's outstanding riches would be a daunting task, given the size of the state and the incredible number of ecological niches it includes. *Sunset's New Western Garden Book*, for instance, divides California into 19 zones, whereas the entire rest of the US finds 10 quite enough. Each zone is packed with its own array of beautiful, distinctive species. One could with profit start at San Diego in January, meander through the zones and months, and finish up at, for instance, Yosemite Park in July. Or one could visit the Botanic Garden in the Tilden Regional Park at Berkeley and see a substantial slice of the pie in just one day.

My own introduction to the Botanic Garden was entirely fortuitous, an offshoot of the 1995 Winter Study Weekend in Seattle, after which I dropped down to see my daughter in Oakland. She directed me to the Garden, then hurriedly left for work—having already experienced my one step/one photo garden viewing style at Kew Gardens during her junior year abroad. And so for one cloudy, comfortable, cool day at the very end of February, she left me on my own in floristic heaven.

## A Brief History of Tilden

The roots of the Botanic Garden lie in a large-scale seed collection made in the 1930s by the Civilian Conservation Corps for the California Forest and Range Experiment Station (subsequently the U.S. Forest Service in Berkeley). These seeds germinated, grew, and were joined by additional varied collections of native woody species, providing inspiration for Howard McMinn, professor of botany at Mills College and consultant to the Santa Barbara Botanic Garden, to propose a garden devoted to native plants for northern California. Professor McMinn persevered, forging a cooperative agreement between the Forest Service and the East Bay Regional Park District and prying his choice for director, James Roof, from other commitments.



Construction began on January 1, 1940, greatly aided by the availability of a small army of WPA workers. Otherwise, the auguries were not so favorable, with World War II imposing a four-year hiatus on completion and the post-war economy absorbing the bulk of the labor supply. However, there was a reservoir of needy students, and with their help and that of his small staff, Mr. Roof wrested the Garden from its war-time reversion to a jungle-like state and set it on the path to full operation.



And operate it did, blessed with a singularly supportive climate that provided a haven for a large number of both northern and southern species right at the limit of their usual ranges. At 282 meters (942') above sea level the worst of the coastal fog is held at bay, and yet the hot, dry days that can typify September in the San Francisco Bay area are ameliorated; at the same time, freezes are limited in severity and extent. Exploiting this situation to the full, niches have been fashioned in the Garden corresponding to seven California ecotypes, from desert to redwood forest, all fully exposed to weather, except for those under a scattering of glass rain-caps in the desert section. Here and there in the various sections a satisfying number of species to delight the rock gardener can be found, often in specially prepared beds.



Wayne Roderick succeeded James Roof in 1974; at present the Director is Stephen W. Edwards. Under their guidance the Garden has been fashioned into a center for preservation and education, and just sheer enjoyment. It nestles on a ridge above Berkeley in the larger setting of Tilden Regional Park, an expanse of undulating trails quite extensive enough to satisfy those needing a physical justification for their plant viewing. It is readily reached by car but, judging from the day I visited, by no means heavily used. In fact, I had the whole place to myself, and I took full advantage of my splendid isolation.

#### One Step/One Photo

A California member of NARGS told me later that winter, January through April, is the peak bloom time in the Botanic Garden. Mind you, this was not at all apparent as I stepped through the gate. There were no masses of color, and the setting was quite serene, since this was not peak foliage time. But step by step treasures unfolded, and I review them here as I encountered them. Most estimates of hardiness I have hazarded are based on the Sunset book.

*Lomatium cf. utriculatum*. I submit that the western Apiaceae represent a major untapped source of rock garden treasures, most certainly to be treasured for the metal-foil sharpness of the dissected foliage and often for the flowers as well. Here we see a grade-B representative, really quite attractive and apparently rather vigorous, but not the choice huddled mound of, say, *L. canbyi*. *Lomatium utriculatum* is probably also not very hardy; at least seeds I've received were collected at a mere 1680 m, which by past experience isn't high enough to be equivalent to the Boston area, where I live. An altitude of 2100 m is more likely to provide the winter-cold hardiness I'm after. But against all that I balance the February bloom, making this and all those that follow of great interest to members in areas more temperate than Massachusetts.

*Zigadenus fremontii*. (photo, p. 107) With its bold foliage and relatively dense racemes this is one of the more attractive members of a genus that, truth to tell, is in general of only modest garden value. Occurring below 1000 m, it can be expected to have only modest resistance to cold.

*Erythronium multiscapoideum* 'Cliftonii' (photo, p. 110). It was with the greatest joy that I heard recently that *E. multiscapoideum* has been successfully grown in the Northeast. 'Cliftonii' is a form selected from the wild that can only be described as luscious. Seed of this form is sold by at least one person in the United Kingdom and occasionally by the Botanic Garden itself, offering additional hope that it can both be obtained and grown outside California.

*Allium cratericola*. (photo, p. 106) There is little promise of hardiness here, as this wild onion comes from the Coast Ranges, but it is a superior species and a promising winter-bloomer for warmer regions or the alpine house.

*Dentaria californica* (*Cardamine californica*, *C. integrifolia*, p. 106). This is a plant for some shade and moisture. I won't rush to fill my alpine house with it, but I can see it bringing early cheer where it is hardy, perhaps among hellebores. The same can be said of the next plant encountered, *Cynoglossum grande*, which could add a stately presence to the same setting. Sunset rates the *Cynoglossum* and the following two species for its zone 4, which implies as low as -17°C (0°F).

*Trillium chloropetalum* 'Giganteum'. Here again the only appropriate word is luscious. What a show this would make in the garden! But in my garden? Hope seems dim. To begin with, hardiness is open to question. And then, should a hardy strain be available, there is something like nine years between germination and blooming...should seed be available. Naturally, I would leap at the chance to try.

*Ribes speciosum* (photo, p. 110). Now and then my attention would in fact be pulled to a higher level: by the startling weird pipes of *Aristolochia californica* suddenly dangling in front of my nose; by the pretty rose flowers of *Ribes malvaceum*, or by the fuchsia-like blooms of *R. speciosum*, an eye-catching red against the subdued background. It is described as just about evergreen if enough moisture is available, but summer-dormant under droughty conditions. What an opportunity for those in warmer, drier regions to combine this currant with other plants of the same strange persuasion—*Clematis napaulensis* and *Daphne jezoensis* come to mind—for a truly minimalist summer garden.

*Arctostaphylos regis-montana* (photo, p. 110). I will leave you as I left the garden, with the vision of this truly magnificent plant. On which California mountain, I wonder, does it reign? Because this is surely a plant to seek out in its native habitat as well, whatever the challenges of the journey.

Jim Jones gardens in Lexington, Massachusetts. He started gardening in the 1960s and joined NARGS some ten years later.



Tilden Park, Berkeley, California (pp. 105-108)

photo, Jim Jones



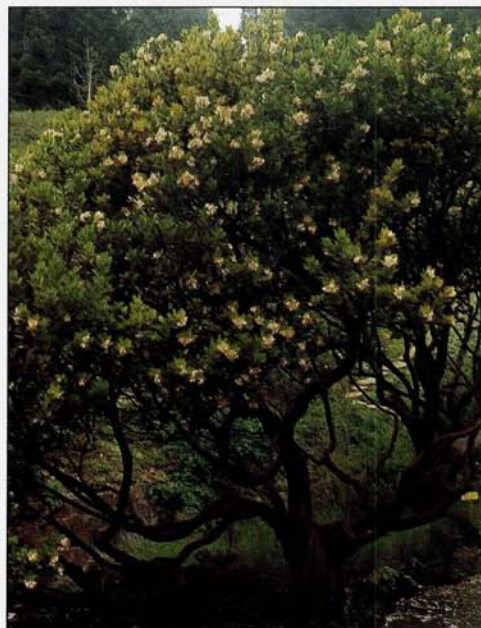
*Erythronium multiscapoideum* 'Cliftonii' (p. 108)

photos, Jim Jones

*Ribes speciosum* (p. 108)



*Arctostaphylos regis-montana* (p. 108)







Tony Liska garden (pp. 101-104)

photos, Josef Slegl

Tony Liska garden





*Silene hookeri* (pp. 143-44)

photo, Rex Murfitt

*Physoplexis comosa* in garden of Tony Liska (pp. 101-104)

photo, Josef Slegl





*Viola orbiculata* (p. 119)

photos, Marilyn George

*Coptis occidentalis* in seed (p. 119)





*Lilium columbianum* (p. 120)



*Penstemon confertus* (p. 120)

*Chimaphila menziesii* (p. 118)



*Pyrola picta* (p. 118) photos, Marilyn George





*Caltha biflora*

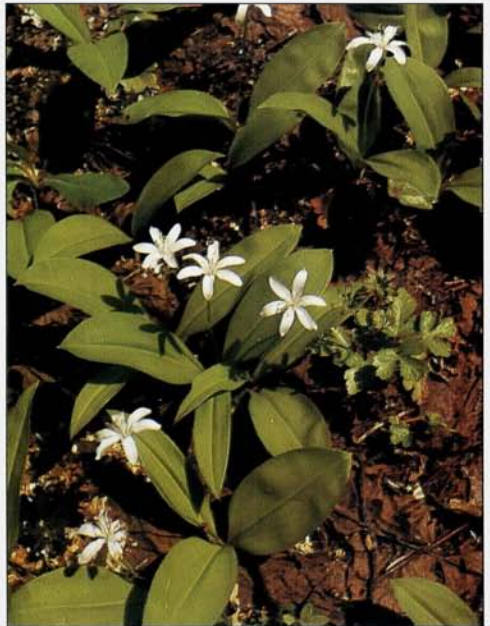


*Coptis occidentalis* in flower (p. 119)

*Cornus canadensis* (p. 118)  
photos, Marilyn George



*Clintonia uniflora* (p. 118)





*Clematis occidentalis* (p. 120)

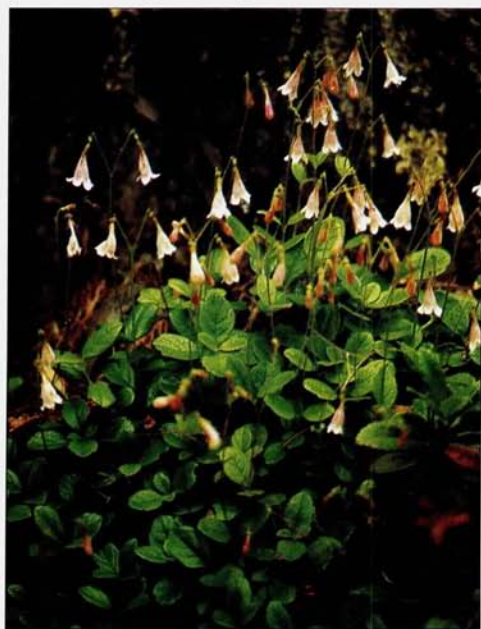


*Clematis occidentalis*, double form (p. 120)

*Calypso bulbosa* (p. 118)



*Linnaea borealis* (p. 118)  
photos, Marilyn George



# UNKNOWN IDAHO

## PANHANDLE GEMS OF A PACIFIC OUTPOST

by Panayoti Kelaidis

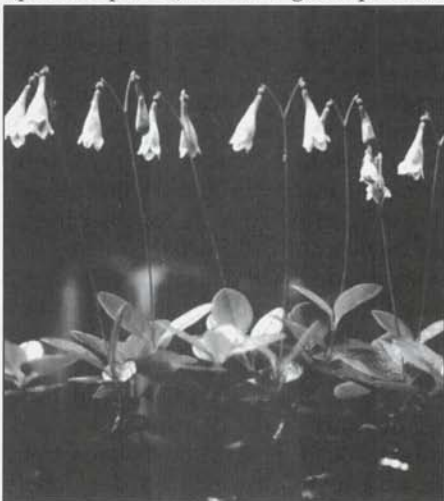
My first trip through the Idaho Panhandle was on the way to the First Interim International Rock Garden Conference in Seattle and Vancouver in midsummer of 1976. I had read enough North American botany to know that the lake country of the Bitterroot Valley of Montana as well as the neighboring parts of Idaho were very special: in fact they are almost a perfect blend of coastal Pacific flora and the drier, more continental Rocky Mountain flora directly to the east. The woods throughout this region consist mostly of conifer species of the great Pacific Coastal forest: giant red cedar (*Thuja plicata*), two kinds of hemlock (*Tsuga heterophylla*, with *T. mertensiana* at higher elevations), two species of larch (*Larix occidentalis* and the subalpine *L. lyallii*) as well as Douglas fir (*Pseudotsuga*) and more widespread fir species (*Abies*). The now famous western yew even occurs here (*Taxus brevifolia*)—the best source for the miracle drug Taxol, which shows such promise for breast cancer treatment. This is the region where western white pine (*Pinus monticola*) is of particular abundance, size, and splendor—and still constitutes an important element

of second-growth woodlands. At subalpine elevations the lodgepole pine (*Pinus contorta*), whitebark pine (*Pinus albicaulis*), and the invariable twinning of subalpine fir (*Abies lasiocarpa*) and Englemann spruce (*Picea engelmannii*) are to be expected—these are found on both the Cascades to the west and the Rockies to the east. Not just conifers, but many woody plants recall the West Coast—Pacific alders and big-leaf maple, for example, trace their way far inland hither, along with the most famous disjunct of all, western dogwood (*Cornus nuttallii*) occurring locally in the Lolo River drainage. As I drove farther north and westward from Colorado, I was struck by the grandeur of this outpost forest, looking almost like rainforest to my southern eyes, its towering trees and diversity of conifers growing together much as they do in California. I felt as if I were about to arrive in Seattle.

Of course, a considerable amount of Pacific humidity and rainfall must pass over the Cascade crests to regenerate a second lush, nearly maritime woodland several hundred miles inland. But I theorize that plants from this region might well have developed

a greater tolerance than those of the coast to continental extremes of humidity and temperature. Indeed, over the years the conifers and shrubs we obtain from this area have proven quite adaptable to zone 5 Colorado. More time will be needed to fully assess the real parameters these plants will tolerate both in the southern Rockies and other parts of the world. What strikes me again and again as I return to this region for further exploration is that this is *not* just a Pacific outlier: this region harbors an abundance of unique floral elements so outstanding, so abundant and unusual, that it is amazing how little recognition this region has received, even in botanical literature. As far as rock gardening consciousness is concerned, northern Idaho and westernmost Montana barely exist.

A stop anywhere in the Lake Pend d'Oreille region is sure to produce a list of choice woodlanders characteristic of the Canadian carpet: *Cornus canadensis* is not rare and blooms and seeds much more heavily here than you can ever expect it to farther to the south in Colorado (photo, p. 115). *Linnaea borealis* and *Calypso bulbosa* (photos, p. 116) seem to grow particu-



larly thickly and commonly in woods throughout the Panhandle. There are two species of pipsissewa (*Chimaphila menziesii*, photo, p. 114; and *C. maculata*), the former smaller, almost white. Both are characteristic of the Pacific Northwest. *Chimaphila umbellata* has a much wider range and is the only species found over most of the Rockies.

Closely allied to pipsissewa are the numerous species and variations on *Pyrola*, the shinleaf of the Canadian carpet. Their waxy, nodding flowers with curving stigmas are fascinating to examine up close, varying from deep rose or red in the commonest sorts to an icy chartreuse in *P. chlorantha* or the diminutive *P. minor*. Two species of pyrola are quite local and distinctive: *P. picta* (photo, p. 114) has very showy foliage marbled with deep purple and white as well as green; the strangest of the genus is arguably *P. aphylla*, a saprophyte development that derives nutrients not from the miraculous action of chlorophyll as most plants do, but from decayed matter in the rich, humusy woods where it grows. (it lives in symbiosis with a fungus, which does the actual work). This ghostly plant usually signals the presence nearby of allied saprophytic ericads, such as *Monotropa* and *Hypopitys*. One of the many coralroot orchids, or phantom orchids, could be near as well, for these are plants of the darkest, least disturbed forests, redolent of woody aroma and moist shade, part of the ecosystem of old-growth forest.

You are certain to encounter two distinctive species of groundcover on even the shortest visit to a woodland hereabouts: the delicate beadlelily, and robust goldthread. The former, *Clintonia uniflora* (photo p. 115), makes lax mats of pale green, liliaceous rosettes. In early summer a pure white, six-petalled lily almost 2" across



appears in each rosette, transforming over the next month or so into a bright blue berry. Beadlily occurs far to the west and south along the Cascade axis, but never as abundantly as in these inland Idaho woods.

Nearby you are likely to find a true endemic of this region: a very sturdy and broadleaved goldthread (*Coptis occidentalis*, photos, pp. 113, 115), making lax mats in mossy woodlands. The leaves are more coarsely cut than the species found in the Cascades to the east, recalling a strawberry, perhaps, or a wiry *Waldsteinia* in outline. Indeed, there is *W. idahoensis* occurring very locally in high mountains not too far south. Specimens of this do not suggest that it compares with the Eurasian *W. ternata*, which makes such an outstanding groundcover in partial shade. But the *Coptis* is another matter: it is everywhere hereabouts. It has very substantive leaves that come through winter unscathed. In the garden it quickly forms a patch of dark-green foliage in earliest spring overhung with incredibly delicate, spidery blossoms quite similar to those of its coastal and Japanese cousins. The subsequent seeds are nearly as showy as the flowers. Goldthreads are not the sort of plants that make the cover of *Fine Gardening*, but for anyone with a love for woodland's faerie scale—and what rock gardener doesn't so love?—they have an irresistible appeal.

Much brighter in bloom, a diminutive violet, *Viola orbiculata*, sometimes grows nearby (photo, p. 113). This tiny gem displays gleamingly bright yellow flowers over a long season in spring and grows in the Cascades as well. It has a wide range throughout the conifer woodlands practically to treeline. It is closely allied to the red-wood violet (*V. sempervirens*), but it is not evergreen and lacks the stoloniferous habit and purple-flecked leaves of

the coastal plant. Oval-leaf winter-green (*Gaultheria ovatifolia*) shares the same overall range (B.C. to Idaho and n. California) and habitats as the violet, growing in dense, coniferous woodlands and forming slowly spreading mounds 4-5" tall. It superficially suggests the Japanese *G. adenothrix* more than the other North American species.

Perhaps the feature that surprised me most in the Panhandle region was the incredible local abundance of ferns. The famous sword fern, *Polystichum munitum*, so prevalent on the western face of the Cascades and coastal Californian mountains, can be quite common here as well. If you are lucky, you might run into Anderson's fern (*Polystichum andersonii*), distinguished by its deeply divided pinnae and single poliferous bud towards the ends of the fronds.

Four species of shield fern (*Dryopteris*) might be encountered in this area, including *Dryopteris cristata*, otherwise restricted far to the east and the north. Deer fern (*Blechnum spicant*) is known from a few localities; it is another dramatic disjunct. Disjunction seems to be a specialty of the region: dutchman's breeches, for instance, are thought of as eastern wildflowers. They nevertheless occur quite thickly in places along the western edge of this region, sometimes growing in quite dry and sunny sites.

Not everything in this region is buried in deep woodlands: rock slides and cliffs in the mountains and near lakes frequently display a rich, distinctive saxatile flora, including shrubby penstemons, phloxes, and husky eriogonums. Quite a few dramatic endemics occur slightly farther south, probably due to the fact that much of central Idaho was never glaciated by Pleistocene ice sheets. Several *Synthyris* doubtless persist in this

region because of this phenomenon, the commonest and showiest of which being the husky *Synthyris missurica* with large, round leaves like a slightly matte-surfaced, clumping *Galax*. These sport a rich sheaf of *Muscari*-colored *Veronica*-shaped flowers for weeks in the early spring. This is commonest at elevations approaching treeline, where it can knit together cliffs or rock slides with its incredibly waxy, lustrous leaves.

The coarsest talus is sure to have heavenly mounds of *Philadelphus lewisii*, the fragrant mock orange blooming in early to midsummer, beloved of the local people and the Idaho State Flower. Ocean spray (*Holodiscus discolor*), the frothy *Spiraea* relative, is common in clearings, along with the lustrous *Rhamnus purshiana*, another outlier from the Pacific Coast flora.

Twining among these shrubs is *Clematis columbiana*, highly variable in the color and intensity of its wonderful lilac or blue flowers (photo, p. 116). Double forms are not unheard of in this American cousin to *C. alpina*.

A bewildering variety of penstemons in the Humiles and Proceri sections can be found in clearings, along streams, or in rocky habitats. The tinier, bluest ones are apt to be one of several subspecies of *Penstemon procerus*, while larger, laxer-flowered plants can come in very pure blues, purples or even yellows. The largest may be *Penstemon wilcoxii*, the yellowest *P. confertus* (photo, p. 114), and the airiest *P. albertinus*. The name *Penstemon attenuatus* covers a multitude of forms and sins in between. High above treeline in the Bitterroot Crest dividing Idaho from Montana the largest-flowered, showiest yellow penstemon of all occurs. This is *Penstemon flavescens*, coming into bloom well past the 4th of July most

years, its slow-to-ripen seed eluding the collector intimidated by September or October snows in its high off-road home.

If you come through this region at the right time of year, in a good year, you may find meadows gleaming and dancing with wood lilies, *Lilium columbianum* (photo, p. 114). They can grow to 6' or more in height and bear dozens of bright yellow turk's caps tinged with a bit of orange. I regret to say that the most stunning displays I've ever seen of this fabulous wild flower were on clear-cuts, almost removing the sting of environmental outrage. This is a plant whose bulbs can endure long years of increasing shade from maturing trees, waiting for the release by fire or desecration to celebrate once more with its brilliant flowers.

This is a first taste of one of the loveliest landscapes of North America. The rolling mountains are somehow more gentle than the rugged ranges to the east or west. These gentle hills and huge lakes somehow combine and recall elements of the Upper Midwest and the Cascades all in one. The rich flora likewise seems to draw on floristic elements from places far away, and harbors a rich assortment of local specialties. Those who live here know this is a well-kept secret, and we who visit find ourselves coming here again and again.

Photo by Marilyn George

Panayoti Kelaidis travels widely in the American West and the world in search of wild plants which can be added to the palette of gardeners.

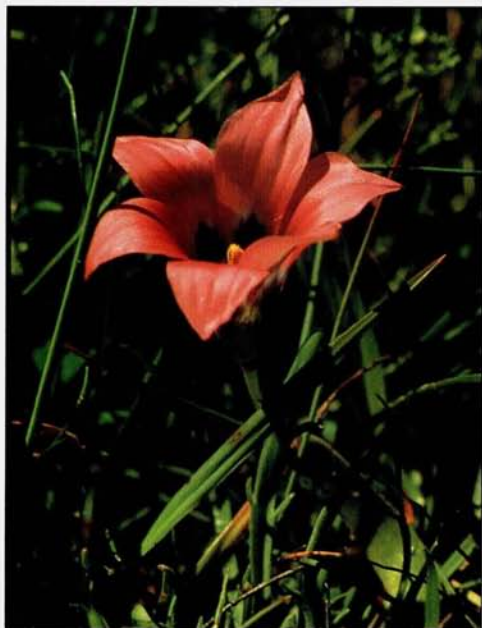


*Romulea tortuosa* ssp. *aurea* (p. 126)

*Romulea luteoflora*

photos, Rod Saunders





*Romulea hirsuta* (p. 127)



*Romulea schlechteri* (p. 127)

*Romulea monadelphæ* (p. 126)



*Romulea atrandra* (p. 127)





*Romulea tetragona* (p. 127)

*Romulea tabularis* (p. 126)

photos, Rod Saunders





*Romulea amoena* (p. 126, 127)

*Romulea subfistulosa* (p. 127)

photos, Rod Saunders



# SOUTH AFRICAN ROMULEAS

## NEW BULBS FOR THE ROCK GARDEN

by Rod Saunders

The winter rainfall area of South Africa, situated in the western Cape, is rich in many bulb species, some very showy and well known, such as gladioli and freesias, others only of interest to collectors and specialists. However, some of the most beautiful of the bulbous species have been largely overlooked by growers—romuleas are one such group.

The genus *Romulea* is closely allied to *Crocus*, and the flowers are similar in appearance. In fact, in the pre-Linnaean era a species of *Romulea* was assigned to this genus. The early taxonomy was varied; in addition to *Crocus*, 5 species of *Romulea* were described as *Sisyrrinchium*, *Bulbocodium*, and *Ixia*. Adason in 1763 established the name *Ilmu* for the genus, but this never gained acceptance. In 1772 Maratti, not aware of the name *Ilmu*, established the name *Romulea* for the species growing near Rome. Numerous authors used this name, and by 1905 the name was in such general use that it was conserved against the older name *Ilmu*. It was a narrow escape—I cannot imagine the name *Ilmu* for the genus, however learned it may be.

The genus *Romulea* has two centers of distribution, firstly the countries around the Mediterranean, with one or two outlying species, and secondly a group of 67 species in the southwestern Cape Province. These two far-flung centers are connected by 6 species with discontinuous distributions on the mountains of Ethiopia, East Africa, central Africa, and the Drakensberg of South Africa.

In South Africa the majority of the species are concentrated in the winter rainfall area from Calvinia to Caledon, with the greatest number coming from the Calvinia, Niewoudtville, and Clanwilliam areas. Visiting these now dry, dusty localities during the summer months, there is a distinct absence of growing plants emerging from the hard-baked ground. Yet in March, at the onset of the Southern Hemisphere winter and thus the rainy season, the landscape is transformed. A whole progression of annual and bulbous plants push their way through the damp soil and begin to bloom, starting with the amaryllids (such as *Haemanthus*, *Brunsvigia*, *Boophane*, *Hessea* and *Strumaria*) and culminating in September with the spring display

for which the area is famous. At times, *Romulea* species such as *R. monadelpha* (photo, p. 122) and *R. amoena* (photo, p. 124) grow in such profusion that they blanket the veld with their red flowers.

Romuleas are found in a variety of habitats and at varying altitudes, with some species growing in deep sand at sea level and others on dry, rocky plateaus more than 2000 meters above sea level. A number of species grow in seasonally moist places, while two species are aquatic (*R. aquatica* and *R. multisulcata*).

Anyone who has seen romuleas in the field cannot but be moved by their beauty, range of colors, and fragility. These feelings are enhanced by the often extreme conditions under which they grow. I am always amazed that such arid, seemingly impoverished

soil can be home to flowers of such beauty.

The plants of *Romulea* are usually less than 15 cm tall, and bear grass-like leaves. The funnel-shaped flowers have a wide range of colors—white, red, orange, yellow, blue, and shades of mauve and purple. The best known red species are *R. monadelpha*, *R. sabulosa* and *R. amoena*. *Romulea tabularis*, a clear blue, is to the best of my knowledge the only blue-flowered species in South Africa (photo, p. 123). Some of the yellow-flowered species are fairly well known and are the easiest to grow. The flowers of *R. flava* are either white or yellow with some pink and blue forms, and it is showy, with a long flowering period. I have it growing in my driveway, where it is almost a weed. *Romulea tortuosa* (photo, p. 121) is one of the best yellow-flowered





species, displaying attractive, spirally arranged leaves (although this arrangement does not always occur in cultivated plants) and deep yellow flowers borne just above the ground. This species is divided into three subspecies, of which two are of interest. *Romulea tortuosa* ssp. *tortuosa* has attractive, 25-mm wide, yellow flowers with dark centers. The second subspecies, *R. tortuosa* ssp. *aurea*, has deeper yellow flowers, 23 mm across, without dark centers, and is unusual in the genus because the flowers are scented. *Romulea tortuosa* is common, and both subspecies may be seen flowering by the thousands in a good year on the Nieuwoudtville Plateau and elsewhere in the western Karroo.

My favorite area for seeing romuleas is the high, bleak, wind-swept, cold, but hauntingly beautiful Roggeveld Plateau, situated at an average altitude of 1600 meters with high points reaching over 1900 meters. By South African standards the area is intensely cold (Sutherland is the coldest place in South Africa), and in winter temperatures frequently drop as low as -16°C (2°F). The area is often covered in snow in winter but never for long periods. This bleak plateau is home to 27 species of *Romulea* and has one of the highest concentrations of species of the genus in the western Cape.

With such diversity in a genus, it is not surprising that species of *Romulea* respond well to cultivation, both in rock gardens and in pots. They are most rewarding, very showy pot plants, with a good color range and a long flowering period with a succession of gem-like flowers. With careful selection of species they should be quite hardy with minimal problems in USDA zones 7, 8, and 9. Experience may prove that even colder conditions may be tolerated.

Romuleas are best established from seed sown in a well-drained, sandy potting medium in autumn. Leave the pots out-of-doors where they are exposed to warm days and cool to cold nights. This temperature fluctuation is probably one of the factors in breaking seed dormancy. Plants will generally flower in their third year.

In areas with dry summers and wet winters the bulbs could safely be grown out-of-doors and would make ideal rock garden subjects and also look good in the cracks between paving stones. We have collected seed of the following species at high altitudes, and suggest that they are likely to be hardy: *Romulea monadelphica*, *R. amoena*, *R. subfistulosa* (photo, p. 124), *R. atrandra* (photo, p. 122), *R. hallii*, *R. monticola*, *R. sabulosa*, *R. tetragona* (photo, p. 123), *R. syringodeoflora* and *R. tortuosa*. Coastal species, such as *Romulea flava*, *R. eximia*, *R. saldanhensis*, *R. tabularis*, *R. schlechteri* (photo, p. 122), *R. hirsuta* (photo, p. 122), and *R. citrina* are not as likely to be hardy and probably need a little protection in colder areas.

Hopefully in time more and more species of this worthwhile genus will become available and find their way into cultivation.

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*Cypripedium acaule*, above, plants in flower; below, plants 19 months after transplanting



# M'LADY'S SLIPPERS

## TRANSPLANTING THE "IMPOSSIBLE"

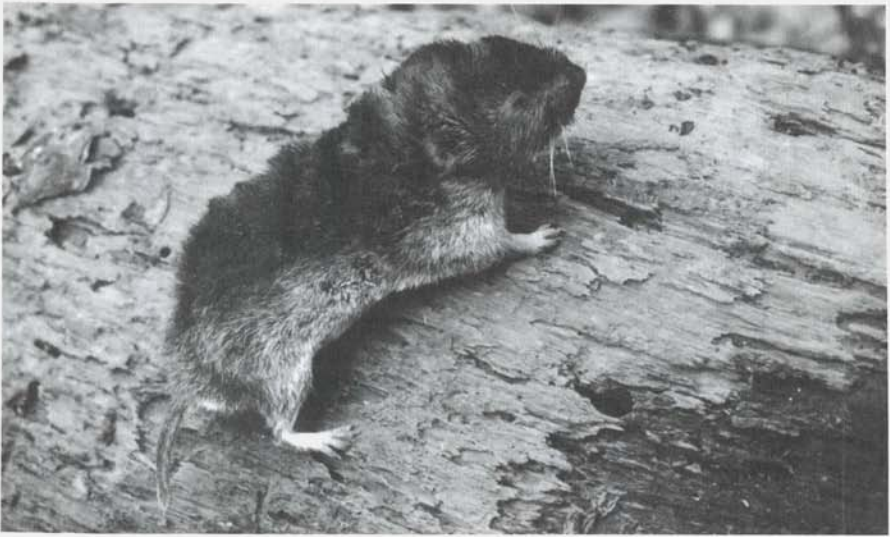
by Don Jacobs

It can not be said too often, or stated too emphatically, that more natural habitats must be set aside and subjected to minimal disturbance. The reasons are manifold. Naturalists need no more reason than respect for the diversity of the natural world. But pragmatists may justly ask why. We have millions of acres of national and state parks, which are acreage eliminated from the tax base, and conversely add maintenance costs to the tax burden. In response, we need only remind ourselves of the crazy-quilt of plants and animals that blanket our globe. Major vegetation types and their accompanying animals cover considerable areas, but within each are numerous variants, so individual that an experienced naturalist can determine his location without a map by observing the biota present. We, therefore, may preserve our natural heritage more effectively with many well distributed, modest-size preserves than with a few remote, giant parks. Both are desirable, because some animals require large ranges or broad buffer zones for protection from predators.

This having been said, I want to speak to another phase of conserva-

tion, from a gardener's viewpoint: the preservation of plants suffering rapid destruction in the wild. Among the first to come to mind in any such discussion is *Cypripedium acaule*, the stemless ladyslipper. It is so named because the large, pink moccasin flower is held erect on a leafless scape rather than on leafy stems, as in most other *Cypripediums*. Its pair of broad leaves arise directly from the root-crown. This universally admired plant has acquired a reputation for being nearly impossible to transplant, and it is frequently cited by conservationists who advocate forbidding all wild plant collecting. Considerable support for such recommendations is revealed by the nearly 100% failure of ladyslippers collected for wholesale and mass-marketed in plastic bags through garden centers. Edgar Wherry, the eminent gardener and botanist, stated, "The Pink Moccasin-Flower is one of the most difficult of our native plants to cultivate. When transplanted it may bloom the first year, but usually produces only foliage the second, and fails to come up the third."

But I have long maintained that *verboten*, or forbidden, things, become



more interesting and are viewed as a challenge by many. Furthermore, it is virtually impossible to enforce such laws pertaining to plants, except against large commercial enterprises. Actually, as urbanization spreads rapidly across our country, many of our choicest wildflowers are being eradicated by bulldozers more rapidly than by plant collectors, in a much more thorough and complete destruction than ever occurred through hand collecting. So what are our options? As individuals or even conservation groups, our power in dealing with the bulldozers of so-called progress is essentially nil. But why do we always consider only negatives or restraints? Our most effective remedies for many problems are positive actions based on knowledge.

Now I will relate a true story. In September of 1992 I received a call from a plant rescue team member. I was informed that the group was making a return rescue trip the following Saturday to a huge subdivision development just north of Atlanta, Georgia. The speaker said, "Dr. Jacobs, we would like you to join us to rescue

lady'sslippers." I explained that I was behind in my work schedule, and I had little space available in my garden at the time. I asked who would be in the group. Among them was a team from a large public garden. I suggested that they transplant the lady'sslippers and was informed that they refused because they had failed repeatedly in the past to grow their own transplants. They would concentrate on native azaleas. At that point I agreed to participate as a demonstration.

When I joined the group, with only my slender trench-spade and two lettuce cartons, they looked disappointed, and said, "You know there are hundreds of lady'sslippers here. How many are you taking?" I said, "I plan to take the first 50 I come to." The young lady who had failed in previous attempts said, "But we filled a pick-up truck with soil and few more plants, and they died in a year or two. How can you expect to move them successfully in two boxes?" I explained that I would move them bare-root. I still recall her shock: "Bare-root—but they require soil microbes." I said, "Wrong! the symbiotic fungi are *in* their roots, so if

the roots are happy, so are the fungi." I asked how they dug them, and she explained how they used a sharp spade to lift a ball of earth with each plant. Once again I said, "Wrong!" I carefully pushed my narrow spade horizontally under a lady's slipper, and shook it free from the litter as I lifted. The seldom-branched, shoestring roots dangled a foot or more long. Since the plant's food reserves are in these roots, successful transplanting requires minimal damage to them.

Furthermore, the roots do not enter the inorganic, consolidated soil. They spread in the transition between litter and consolidated soil, making it easy to lift them intact. Digging balls of earth invariably cuts across roots, and increases risk of breakage in handling.

To transport the plants, a layer of sandy humus from the site was spread in the carton, and the bare-root plants were carefully stacked until the desired number was collected. They were then covered with more sandy humus and taken to the transplant site at Eco-Gardens. During my survey of

the subdivision, I estimated 3,000-4,000 plants were present; several hundred were rescued. Most of the remainder were bulldozed, but some still survive on developed homesites. At the research garden, a site was selected that had not been previously cultivated. It is beneath large oaks and revealed no vole tunnels. A heavy steel rake was used to remove the litter and score the compact soil. The orchid roots were spread flat on this interface, and the sandy litter was scattered back over them. About 2" of wood-chip compost was added. A light coat of dolomite dust was scattered on the surface, and the planting was watered thoroughly. As new growth began in the spring of '93, a light top-dressing of 6-12-12 granular fertilizer was added. The additions of dolomite and granular fertilizer on initial plantings are standard procedure with me at Eco-Gardens, where our annual rainfall of 50" insures an acid medium and leaching of nutrients. Established plantings obtain adequate nutrients from recycling of organic matter, so



crown after vole damage

later supplements are seldom required. Where alkaline soils are the rule and rainfall is 30" or less, I do not recommend adding dolomite or granular fertilizer. Each gardener must work with the hand he was dealt.

Since this was a recorded demonstration, I made certain predictions and stated that the site would not be disturbed for at least three years. I predicted 50 to 52 crowns in the spring of '93, with approximately 20 flowers, and half that many seed capsules formed. The actual '93 count was 51 crowns, 21 flowers, 10 seed capsules. For Spring '94 I predicted about 65 crowns, about 35 flowers, and half as many capsules developing. Actually 59 crowns appeared, producing 31 flowers, and 16 capsules. The spring '95 count was 66 crowns with 40 flowers. Summer droughts (as in '93 and '95), damage from falling branches, burrowing rodents, etc., can alter the annual increment. With vigorous plants and optimal soil, moisture, and shade conditions, an annual increment of about 30% can be expected.

No one has yet devised a reliable regimen for growing this plant from seed. As recently as 1941, J.S. Doig stated, "No one has yet produced flowering plants from seed of this species." Since then, several workers have germinated seeds on sterile media with varying success in growing on, but commercial production from seed is not in sight. Some recent observations at Eco-Gardens of rather mysterious spontaneous development of ladyslipper seedlings has stimulated exciting speculation in this direction. *Cypripedium acaule* occurs in the wild from Alabama, Georgia, and South Carolina in the South to near the Arctic Circle in northern Canada, and from dry pine woods or oak-hickory forests in the South to sphagnum moss bogs in the North.

The roots of *Cypripedium acaule*, like those of many terrestrial orchids, emit an odor of urea, which seems offensive to rodents. Nevertheless, I have observed instances of voles eating the foliage down to the roots, leaving no bud for next season's growth. Such plants usually die. Therefore, vegetative propagation is not very promising. On the other hand, vigorous plants will spontaneously produce multiple buds. When dormant, these plants may be lifted and carefully cut apart between the buds, protecting the attached roots, replanting as individuals.

Disseminating this kind of information should greatly increase success of plant rescue efforts, add to enjoyment of our gardens, and allow all serious gardeners to participate in wildflower preservation. But we must not generalize carelessly in our methods. Each kind of plant should be approached with respect, so as to learn its peculiar requirements. Other kinds of terrestrial orchids are equally desirable garden plants, but both structure and requirements are vastly different. This, of course, should be expected, because each has evolved to take advantage of a particular niche in the scheme of things.

Don Jacobs gardens at Eco-Gardens near Atlanta, Georgia. His interests in plants, and all biology for that matter, are wide-ranging. Photos by the author.

# Castillejas:

## Meeting the Challenge

by Ken Sherman

Do you remember your first rock garden? It probably began when a neighbor gave you a box full of sedums and, since they were described as being rock plants, it was necessary to scour the roadsides in search of rocks to put with them. Then you visited a nursery and happened to see a sign above some pretty, blooming little things that were called rock garden plants, and the next thing you knew you had a pleasing patch of color in your yard that begged for more. Soon your weekend outings became plant gathering trips, based on the idea that if it is wild and not too tall then it must be a rock garden plant. Before long that little space was overgrown with all sorts of likely subjects in various stages of dying, while others had become noxious weeds. But there were just enough successes to spur you on to the next level—buying a book about rock gardening.

That is pretty much how I got started 20 years ago. I was, and remain, a terrible procrastinator, especially when it comes to maintaining my garden. I was always running across some plant I had presumed dead that was miraculously rejuvenating itself.

So I tended to put off uprooting the ghostly remains until my more meticulous neighbors began objecting. Besides, it was a blow to my ego to have bragged about some new treasure, only to have it later waste away. I always preferred to state with mock authority, "This is what it looks like when it is dormant," and I could often get away with it for six months or more. I just hoped that they would have forgotten about it by then.

One of my favorite plants was a glowing red paintbrush that found its way to the garden after a fishing trip. It was terribly wilted—as was almost everything that I brought home in those days—but I announced it to be dormant. I forgot about it myself until the next spring, when I discovered a huddled group of hairy little leaves emerging at the base of the twiggy remains. Blooming followed several weeks later, and I added one more "I told you so" to my list of victories.

Then something happened that would change the way I looked at rock gardening forever and would eventually lead me to a horticultural career. I ran across a book written by someone named Lincoln Foster at a book sale. It

would be several years before I truly appreciated how important this find was, but as I was pouring through *Rock Gardening*, familiarizing myself with the new-to-me language of botany, I fell upon a statement under the genus *Castilleja* that grabbed me. "IMPOSSIBLE," it said. "VIRTUALLY IMPOSSIBLE."

Now, if I had read that pronouncement several years earlier, I would probably never have attempted to bring my first paintbrush home, or I would certainly have yanked it out of the ground when recovery wasn't evident within a few days. But reading this *after* my marginal success, this was an irresistible challenge, not to go unanswered. I have always been afflicted with a malady that causes me to challenge conventional wisdom. I suspect that there must be something masochistic about this, but all someone has to do is say, "You can't do that," and I am overwhelmed by the urge to prove them wrong—often with disastrous results. Nevertheless, paintbrush cultivation seemed tame enough. I just needed to find out why I had experienced success when so many others had failed.

Several years after my preliminary encounter with paintbrush gardening, we moved from the wet Willamette Valley to the high desert region of central Oregon, where my rock gardening skills took a giant leap forward. The almost-forgotten questions surrounding *Castilleja* were revived by the flaming chorus of flowers that dotted the sagebrush and juniper landscape. By this time I had developed a keen awareness of how unacceptable was the practice of randomly digging native plants; nevertheless, rampant construction was putting vast acreages of sagebrush under asphalt: an abundant supply of wild plants could be snatched from the path of the front-

end loader. There were some failures with these wastrels, of course, but successes outweighed them, and some fascinating "secrets" emerged to testify to the amazing adaptability of plants.

Much has been written about seed propagation, including David Joyner's excellent article in the Fall 1995 *Rock Garden Quarterly*. But other propagating methods seem to have been dismissed, due to the presumed need of a host plant to provide water and food supplements to *Castilleja* root. While a hemi-parasitic relationship certainly exists in wild settings, I have come to the conclusion it is not a prerequisite to successful cultivation. I base this bold statement on observations that I have made and leave it up to others to reproduce my results. I am not a botanist, so maybe my naiveté allows me the privilege of not being bound by scientific methods of investigation. I am free to make a different set of assumptions and draw my own conclusions.

The first assumption is that if a plant has acquired the need to parasitize another plant in order to meet certain requirements, then perhaps those requirements could be met in some other way. *Castilleja chromosa* is a common species of the dry scablands east of the Cascade Crest. The paintbrush is associated with drought-resistant perennials such as *Festuca idahoensis* and *Achillea millefolium*. Both of these are very efficient at extracting and storing meager amounts of moisture, and their cycle of dormancy-active growth coincides perfectly with that of the paintbrush, making for an ideal host-parasite relationship. My conclusion was that the primary dependency of *Castilleja* is for a host that can provide water.

The dominant *Castilleja* species of the subalpine meadows is *C. miniata*.





Here the habitat is wetter and the primary hosts are *Trifolium* species and a few other rhizomatous, shallow-rooted perennials. Water requirements I presumed could be met in these moist, meadow soils. Indeed pure stands of the paintbrush have been found on gravel bars and moraines with no other associated plants or encroaching

roots to be found within many feet. This would then support my assumption that the parasitic bond could be broken if sufficient water was made available.

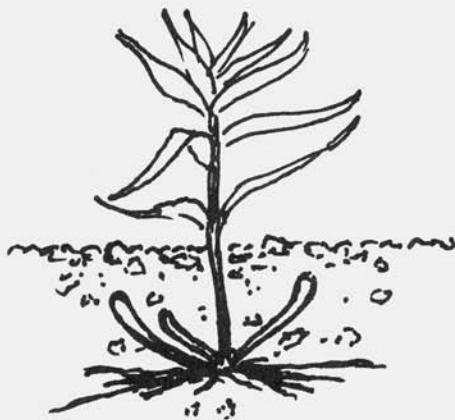
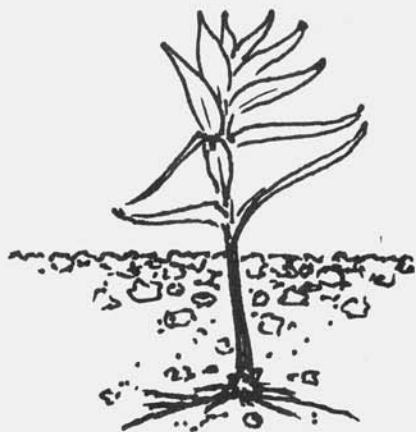
Evidence of sensitivity to the availability of water has been found in transplanting. Dug plants kept in sealed plastic bags for several weeks

show no signs of wilting. Self-sown seedlings have been found with their roots grasping and penetrating buried chunks of rotten wood and porous rock; both substrates have great water-holding potential. If the need for moisture is acute, then we can assume that the plant would be very sensitive to the slack of it. It makes sense within this paradigm that a dug transplant wilts within minutes if it is not placed in a plastic bag. Yet in this case an amazing chain of events seems to be taking place to preserve whatever water is possible.

When in active growth, the roots of *Castilleja* have a brittle, almost succulent texture. As dormancy sets in, a thin, woody bark develops that persists until the roots are able to take on moisture after the ground thaws in the spring. This covering may serve as a layer of protection during winter months, as it gradually disappears during the growing season. Even the most careful digging while the plant is actively growing will sever some roots, causing a disruption in the plumbing. Wilting begins at the bracts and progresses downward with brief

stops at the leaf nodes. Meanwhile, each broken root becomes pinched and immediately forms a callus. All moisture within the tissues is contained by the sealing of the roots and the wilting of the top growth. Once a state of equilibrium is reached, the plant remains in a stage of induced dormancy until a healthy new root system can begin taking on water again. During this dormant time, the bark-like root covering reappears. Dormancy may last from one to eight months, depending on the amount of damage and the time of the year in which the transplanting occurred. While in this dormant state the plant appears quite dead, and it is no wonder that so many attempted transplants end up in the compost pile.

The crown is the center of growth activity for the plant, and special treatment is required to protect it. It is a thickened, bark-covered organ, or caudex, from which new growth emerges. It is usually buried about an inch underground in *Castilleja*, and, if exposed, will fail to produce the next season's buds. Frost heave may sometimes serve to assure burial of the

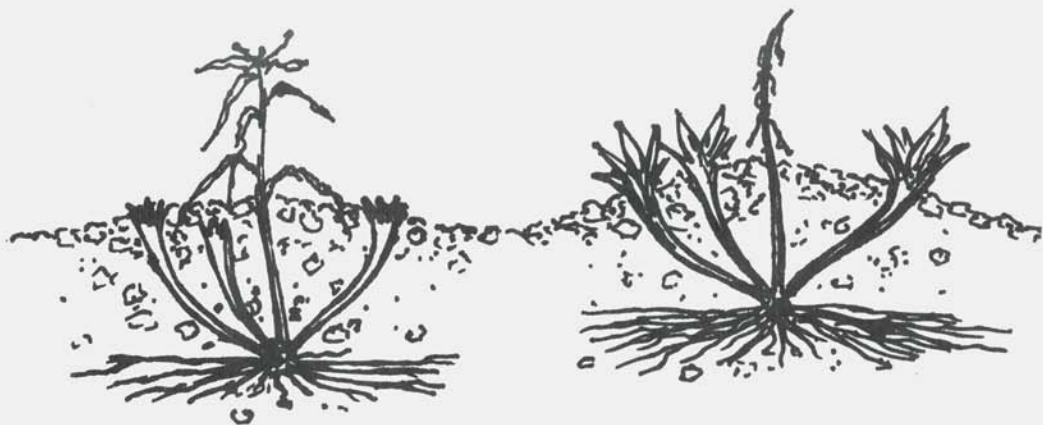


caudex, pushing up the soil and producing a fluffy layer that may also act as insulation. New growth buds are produced in autumn around the base of the previous season's stems where they emerge from the caudex. The buds remain closed throughout the winter and are very weakly attached. Should they be knocked loose, it is almost certain that new buds will not be produced, and the plant will be unable to manufacture food when it emerges from dormancy in spring. In spite of the fragile state of the buds, this is the best condition in which to transplant paintbrushes.

As growth commences, the dominant buds develop into flowering stems and the remaining buds carry on the task of food production. Vegetative shoots remain shorter and leafier than the flowering stems, and their leaves usually persist long after seed production is complete. It is these stems that produce the bud crop of the next year's growth. As this pattern is repeated each year, the caudex becomes increasingly larger and more complex. Multiple crowns develop, and some may eventually rot away.

These living crowns can be stripped from the caudex with a few roots attached and buried in sand, then placed in a tightly sealed cold frame. If this operation is carried out in early spring, and care is taken not to lose any of the tender buds, growth can be expected within three months. There are many variables here, but I have used this procedure to produce flowering plants.

A far better procedure, and the one to produce the most consistent results, is to remove the vegetative, food-producing shoots and treat them like cuttings. This is best done in mid to late summer, before seed production has begun, when these secondary stems are about 2" in length. Each stem is removed from the caudex with a downward push to provide a heeled cutting. While rooting will occur without a heel, it is much faster when a heel is present, usually occurring within three weeks. Care must be taken not to crush the stem, as it is quite soft. The roots are very thin and hair-like, making examination of cuttings somewhat risky. I line the cuttings out in a flat and use horticultural-grade pumice as



a rooting medium because of its water holding capabilities and high aeration. Also, the larger grain size allows for the cuttings to be inspected without root damage that might occur with heavier sand.

Soon after rooting begins, a slight thickening will become noticeable just above the roots. This is the new caudex forming, and new shoots will begin to appear as thin, whitish attachments radiating outward from it. These slowly curve upward, until they just break the surface, where they will remain until spring. The presence of these shoots will show as a pronounced bulge in the spring. Then the new plants can be potted up or planted out directly. In either case, it is very important to harden the paintbrushes off gradually, exposing them gradually to the vagaries of outdoor temperatures and conditions. Be careful not to dislodge the new growth when transplanting. The safest approach is to set the cutting into the planting hole by grasping the remnant of the shoot taken during the previous summer. Then sift the soil over the roots and stems until the caudex and the new shoots are buried. A gentle watering will settle the soil and expose the tips of the buds. If too much of the stem becomes visible, add more soil. The stems will gradually emerge through the soil and lose their white color as the leaves begin to develop. An occasional check for wilting and additional watering as necessary during the first few weeks will ensure a healthy, flowering plant by early summer.

Cuttings that have been potted up are given a dose of 14-14-14 Osmocote when growth begins, while those that are planted straight to the garden seem to do fine without any feeding. Once established in the garden, they will accept any watering regime, although it makes sense to plant the

dryland species with their own kind and species that prefer moist soils with plants of like taste and requirements. As with any other plant in the garden, drainage is important. This is especially true in winter when the woody caudex is most apt to rot.

Other propagation techniques need to be tried. I suspect that root cuttings may be possible, and on one occasion, simple division was successful with a large specimen whose crown had developed into a twisted bundle. The entire mass was carefully unwound, and the division operation resulted in five plants. All eventually flowered and set seed.

I may have been just plain lucky with that first paintbrush 20 years ago, but the following successes have come as a result of trying to crack the riddle, taking on a fun challenge. I am continually amazed by the adaptability of so many difficult plants and the hidden mechanisms that they employ to ensure survival. With continuing successes with plants such as *Draba mollissima* and *Primula allionii* in our garden, I find it increasingly difficult to take pronouncements of plants as "impossible" literally. Being patient is a must for growing plants. Rock gardeners are great innovators, and perhaps this tale will inspire someone else to uncover new secrets about this fascinating genus and enrich us all with these discoveries

Ken Sherman and his wife Linda have been rock gardening in Bend, Oregon, for about 17 years. They have a series of crevice and scree gardens and a nursery called Alpine Specialties. They also build rock gardens for commercial and residential landscape customers.

# Campanulas:

## Further Musings

by Ken McGregor

The Summer '95 issue of the *Quarterly* I found to be most interesting, dealing in depth as it did with *Campanula*, a genus of which I am particularly fond. Some of the accompanying photos were mouth-watering: I have never yet grown *C. tommasiniana*—but I will!

Bells, both floral and cast, have long had a potent hold on the imagination, associated as they are with churches and temples, with weddings, death, and with the macabre. The widespread and beautiful campanula, the Scots bluebell, *C. rotundifolia*, has since time immemorial. Also called the harebell, it is associated with the brown hare, whose path you crossed at your peril, as the rabbit might be a witch returning from a coven. To children *C. rotundifolia* was the pixie cup, as every illustration to *A Midsummer's Night Dream* or fairy-story bears witness.

In marked contrast to so many other plants, *C. rotundifolia* has amazingly managed to retain its Latin name. This despite the fact that its stem leaves are linear, not round, and so its epithet could be said to be a misnomer. To be honest, however, it does have a few, transient, round, basal

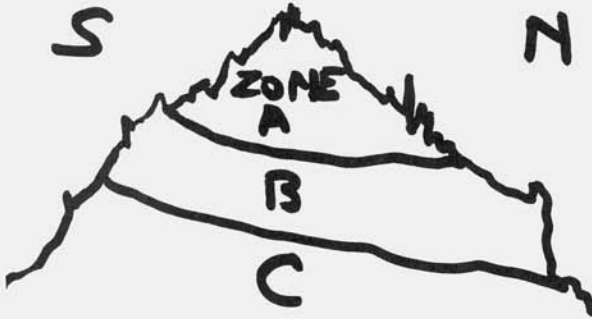
leaves. The English bluebell, (not a *Campanula*) in marked contrast, has changed its name as often as a petty thief: *Endymion non-scriptus*, or *Scilla non-scripta*, or *S. nutans*, or *S. festalis*, or *Hyacinthella non-scripta*. One visualizes even now, somewhere, somehow, some botanist renaming and reclassifying it.

### A Gastropod Speculation

Bells have inspired poets to rhapsodic lines of melancholia. But we rock gardeners do not need to ask for whom the bell tolls. We know only too well that it likely tolls for our only plant of *C. zoysii* or *Physoplexis comosa*, reduced overnight to a sluggy mess.

High-alpine campanulids seem very vulnerable to slugs and snails. It seems incredible that they could ever have evolved and survived in nature. There can be only one possible explanation: they developed and reproduced in a mollusk-free environment.

It is interesting to speculate on the sequence of events. Let us postulate a group of mountain proto-campanulids isolated at the end of the Pleistocene from their parent stock and subject to Darwinian selection. In those habitats



<u>Zone</u>	<u>Molluskan status</u>	<u>Typical campanulids</u>
A	Virtually absent	<i>Campanula zoysii</i> , <i>C. cenisia</i> , <i>C. alpina</i> , <i>Physoplexis comosa</i> , <i>Edrianthus pumilio</i>
B	Condition adverse. Snails predominate over slugs.	<i>C. barbata</i> , <i>C. excisa</i> , <i>C. pulla</i> , <i>C.</i> <i>carpatica</i>
C	Conditions favorable Slugs predominate except at very high pH levels.	<i>C. portenschlagiana</i> , <i>C.</i> <i>cochlearifolia</i> , <i>C. patula</i> , <i>Edrianthus</i> <i>graminifolia</i> . <i>Phyteuma hemisphaerica</i>

and in the presumably then prevailing colder conditions, land mollusks could not survive. Thus, random development of a chemical in the campanuloid plant tissues that as a side effect also acted as a scent or taste attractor for slugs would have no immediate adverse affect on the plant population. The undeniable attraction that campanulas have for these spineless beasts is so strong—could it be some inadvertent form of mollusk pheromone? Slugs, of course, are hermaphroditic, so it is interesting to speculate on how they might attract other individuals without driving themselves crazy with self lust. In the presence of a pre-existing mollusk perfume, any climatic warming could be catastrophic and favor predator rather than prey.

With climatic amelioration, i.e. warming, the by now newly evolved Campanulae, Phyteumae, Edrianthae would re-adjust their distributions across the landscape. Some species

would be capable of meeting the gastropod challenge; the less resistant—or is it the most attractive?—would be for all time confined to the highest peaks where weather conditions remained inhospitable to their slug admirers. And thus we find a zonation in alpine regions.

Slugs and snails are, of course, closely related, but, in my experience, slugs do far greater damage to campanulas than snails. Whenever I have ring-fenced a prized bellflower with pellets, the victims have invariably been slugs. Snails have one advantage over slugs in high-arctic (as in desert) conditions—they are less dependent on free water for slime production—and snails can probably survive lower temperatures, especially where shallow scree or talus occur.

Apart from zoological differences, i.e., radula variation, color, and size, slugs are, to me, of three kinds: 1) those that burrow, such as *Milax* and the

immatures of many other species, to whom I attribute most root damage; 2) those *Arion* types which scythe off fleshy-rooted forms such as *C. barbata*, *C. radula*, and *C. sartorii* at ground level; and 3) the abseilers who seem to feed from the top of the foliage down—small *Arion* species and a giant *Limax*.

At this juncture I must admit that the whole of the foregoing hypothesis, including slug types, is a mere flight of fancy of mine, a whimsy, which I have set in scientific jargon to give it credence. But, and a large reservation, can you disprove it, or come up with a more satisfying theory?

### *Campanula zoysii*

Plants of my A zone are well loved, particularly those like *C. zoysii*, which are most difficult to grow. Incidentally, this plant was reputedly named for a Texan shotfirer, Charlie Zoyses, who, whilst working as an expert on Swiss tunnels, invented the crimping pliers used to secure explosive primers. Previously to this innovation, these were crimped by biting; Charlie wished to retain his job after his teeth decayed. An alternative, but less attractive theory, is that the plant was named in honor of Karl Freiherr von Zoys, an 18th century Austrian botanist.

Thus far I have failed to obtain *C. zoysii* seeds from the seed exchange. A plant purchased last year at great expense duly disappeared in its concentric pots in autumn and failed to re-emerge in the spring. *Physoplexis comosa* did reappear, and I was enchanted both by the flower and later by the intricate lacing of the developing fruit. If this was an underwater plant, one would expect to see tiny shrimp imprisoned therein—the fruit looks as if it belongs to some order of silicaceous sponge.

### Seed Adventures

Misnamed seeds, as mentioned by others, can result in great disappointments, but they can also yield delights. From the 1991 list I chose *P. comosa* (#3969) and *Phyteuma humile* (#3973). Both flowered for me this year—both being, I think, slightly different forms of *Phyteuma scheuzeri*, a species of horned rampion characterized by long, linear bracts below the flower head. This is a plant I had previously not encountered. Both accessions have flowered continuously for months on end, and I find them very attractive.

### High Collar Cold Shoulder

Returning again to the slug problem, early in 1995 I recalled I once read in a Victorian gardening book that *C. zoysii* and the like could only be grown in the rock garden when surrounded by a 4"-high zinc collar. As an experiment, I tried plastic collars instead. In Europe, and, I have no doubt in the States also, table-water, cola, and the like now come in plastic bottles about 4" in diameter. By removing the top and bottom—easy to do with a sharp knife or scissors—a smooth cylinder 4" wide by 8" high is created. The containers in the States may differ slightly. At least 2" must be sunk in the soil both for stability and protection against burrowing pests.

I have used these high collars this year on *C. cenisia*, *C. saxifraga*, *C. trogerae*, and so on. Seedlings of *C. makaschvili* (from Mr. Jurasek) I divided into two groups: one-half left in a pot, the other in a cylinder on the rock work. Those in the cylinder grew considerably better. My only loss so far has been the delightful *C. excisa*, which succumbed not to a slug but to a caterpillar of the small white butterfly, *Pieris rapae*. An open-topped cylinder is clearly still subject to aerial attack, although I was surprised, as I do not

recall caterpillars attacking other campanulas. Of course, no alternative food was available to the caterpillar, presumably hatched there and effectively imprisoned.

The summer of 1995 has been exceptionally hot and dry in Britain, necessitating twice-daily watering. I have lost a number of kabschia saxifrages, and other choice alpiners, but not the high-collared campanulas. Presumably the cylinders conserved moisture. But please don't count on this with your own precious specimens—or if you do, don't blame me for failures!

#### Unnecessary Divisions?

Authorities say that certain campanulas need to be regularly propagated: *C. pulla* and *C. excisa* certainly seem to die out if left unattended, although I have not found this to be the case with the oft-mentioned *C. garganica*. Usually such dependency in plants is due either to exhaustion of one or more trace elements in the soil, or to a build-up of toxins or parasites in the soil. If a compound fertilizer with trace-elements is used in moderation on such species, the first consideration should be resolved. Has anyone identified a virus or, say, an eelworm infestation that could explain the latter? I imagine that subterranean slug attack is often the unsuspected culprit. Until the mystery is solved, certainly one should favor planting such species in areas where they can move laterally to fresh fields and pastures new.

#### Photographing

Discounting the muddy pinks and whites of some cultivars, the color of campanulas is lovely. The blues are not the cobalt blue of gentians, but rather that of delphiniums and of moody Holly Golightly blue. As such it tends to reflect, when the eye of the

beholder is a camera lens, both the blue and red bands of the spectrum. Most of us who take pictures know how difficult it is for this reason to render the blue on film. Certainly bellflowers photograph best in the cold light of morning and in partial shade, rather than in direct sun. If one uses a pale blue 82A filter the blues in the photographs appear closer to what our eyes see. A tip: if one of the darker blue 80 series or similar filter is used on a campanula with few visible leaves, and the shot is set up in front of a brown sandstone rock or brown mat board, the blue will appear strengthened whilst the background will be rendered as a natural-looking gray.

#### The Difficult-to-Cultivate

Bells are ubiquitous: from Canterbury to Bow; from temples to ships to hippies. They are loved for their shape and symbolism, the floral forms for their color as well. Last time I was in the States, driving down in stages from New England to New Orleans, I thought I would take a look at the native habitat of the Liberty Bell. I got lost on the freeways and back streets of Philadelphia and am sorry to say I missed it. Liberty is rapidly becoming an endangered species in the developed world and seems virtually extinct where it has been introduced in the past half-century. It seems as nearly impossible to cultivate as *Campanula zoysii*.

Ken McGregor is a seventy-something who has a small garden and greenhouse in mid-Wales, roughly 50% of the garden being rockwork. He is an admirer of gentians and saxifrages and is a member of the Saxifraga Society.



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# PLANT PORTRAIT

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## *Silene hookeri*

It is gratifying to witness the extent to which North American rock gardeners take interest in their own natives. The lovely and challenging plants have for too many years taken second place to those of other continents. Only a few years ago rumors still circulated describing their strange cultural requirements, and they had a reputation of being impossible to grow. For many years a few men and women across the land were quietly growing the North Americans, content with their group of horticultural peers. Today, on the other hand, there is a lot of publicity; articles and books abound, even International Conferences have been held devoted to these plants. Everywhere skilled gardeners are pushing back barriers to their successful cultivation. The *Rock Garden Quarterly* has grown into a highly respected publication. I think it fair to say we are progressive in the field of growing our native mountain flowers.

Imagine my consternation and surprise to read in a 1938 copy of the *Quarterly Bulletin of the Alpine Garden Society* that in England a man had not only grown and showed but had hybridized large plants of a hybrid of *Melandrium hookeri* with *M. pulchrum*. "What," you may well ask, "is that?" Some may remember *Melandrium* as an outdated name for some of the native *Silene* species. *Melandrium hookeri* is now known as *Silene hookeri* and *M. pulchrum* as *Silene californica*. I was very surprised to learn that these tricky species from the Siskiyou Mountains were known and grown in Britain over 40 years ago.

*Silene hookeri* was first introduced into Europe over 100 years ago, and since that time many British garden writers have described it as "a plant suitable for the rock garden and alpine house." Some say they managed to keep it going for several years. Under any kind of cultivation, it must have superb drainage and complete rest during the summer and absolutely no water throughout the winter. Most British writers stated that *S. hookeri* required full sun, and this may well be true in some climates. Boyd Kline, of Medford, Oregon, always grows his native silenes, with success, in partial shade. I have always found *Silene hookeri* growing wild in the shade of light woodland and have noted that it totally disappears, becoming dormant, as the hot summer approaches.

Very little research was necessary to find the grower of that 1938 plant. It was none other than the famous Mr. G. H. Berry (1880-1956), skilled grower of a wide range of choice plants. He was particularly recognized for his skill growing Asian gentians in pots and for his excellent book, *Gentians in the Garden*. He maintained a large garden just outside London, where he grew a wide range of plants in addition to his beloved alpinists. He possessed a brilliant, inquiring mind that led him to carry out detailed and extensive soil mixture trials oriented to the successful cultivation of choice alpinists in pots. Pot-grown Aretian androsaces ran a close second to his gentians, although the list of his triumphs included many difficult species such as *Eritrichium nanum*, and, of course, *Silene hookeri*. His exhibits at the shows were always of outstanding quality, often

showing several specimens of a particular species with each plant grown in its own special soil mixture, showing the different results, if any.

G. H. Berry made the cross between *Silene hookeri* and *Silene californica* during June of 1935 with the latter species as the seed parent. The seed was sown as soon as it was ripe. As often happens, the hybrid was extremely fertile, producing lots of viable seed which germinated readily. Flowers appeared the following June, bearing petals of soft pink, without any pale eye. There is a black-and-white photograph in the *Quarterly Bulletin of the AGS* showing a large, pot-grown specimen in full flower. Even without color it is easy to see that the fading to a white eye, so typical of *S. hookeri*, is absent. Other than that, the size and shape of the individual flowers are very similar to *S. hookeri*. It is possible that the laciniation of the petals could be deeper than shown in the photo, but one would need to see live plants to really judge. It is interesting to note that the vivid scarlet color of *S. californica* does not dominate the pink shades of *S. hookeri*.

The natural distributions of these two species overlap in the Siskiyou Mountains, both flowering at about the same time in May and June, yet there appear to be no reports of natural hybrids. Perhaps we may hear from an observant reader that they do exist? In nature *S. hookeri* is a plant some 5" tall, with procumbent stems clothed with narrow, grayish, sticky leaves. The bright flowers are usually soft pink but can vary to almost pure white. The five petals are about an inch long and are each deeply divided into four lobes.

*Silene californica* is very similar in foliage and habit to *S. hookeri*, is usually several inches taller, and produces scarlet flowers with deeply lacinate petals.

A few years ago I collected a very pale form, almost white (photo, p. 112). It was spotted from a moving vehicle as we negotiated an area of highway construction in the Siskiyou Mountains near Happy Camp, California. Closer examination showed it to be hanging almost out of the soil at the top of a 30' bank that had recently been regraded by highway crews. I was able to rescue it from certain death: most of the root system was already exposed, and it was a simple matter to remove the gravelly soil and expose the main taproot, literally collecting from the bottom up. These unique conditions made collecting feasible. I got the plant back to Victoria, USDA approved, and over-wintered it in the alpine house. It flowered in late spring, and I collected some seed and gave it away. I lost the plant the following winter, probably from too much moisture at the wrong time.

It would be fun to attempt to remake the *S. hookeri* x *S. californica* cross today. The first challenge would be to produce the necessary breeding stock. *Silene hookeri* seed is usually available from the seed exchanges but all too often turns out to be an inferior, biennial *Lychnis*. In my garden, this unknown species (or hybrid) seeds itself freely, often over-wintering in full leaf, and during mild spells will often produce a few of the pleasing-pink flowers. The pink petal color is the only thing this impostor has in common with *S. hookeri*.

No mention of the North American silenes could be complete without a tribute and a plea for the reintroduction of the fantastic *S. hookeri* var. *bolanderi*. This truly exotic-looking flower bears 3-4" wide, spidery flowers of pure white, each petal lacinated all the way down the petal to the center of the flower. For more on this delightful, challenging plant, see Boyd Kline's "Some Western Treasures," *American Rock Garden Society Bulletin* Vol 39:p. 184; ill. p. 187.

—Rex Murfitt

## UPLANDS: LIFE AMONG THE ALPINES

—continued from p. 88

Why do gardeners garden? Especially, why try so hard to grow temperamental plants with fussy requirements and unpredictable personalities? And what makes a plant a favorite? Summon the poets—let me count the ways. It is as irrational, personal, and idiosyncratic as the gardener's genes. Often I think I would give up a large section of rock bed if I could have one perfect specimen of *Androsace* 'Millstream' or *Physoplexis comosa*, or have a fern return and flourish as *Asplenium ceterach* once did. For rock gardeners, it has to do with delicacy, the structure of leaf and flower fitting together with a clock's perfection of parts, far too rigid a comparison for shapes so fragile. But contradiction leaps with every work: there is nothing visibly fragile about the cushion of a saxifrage—often a sturdy community of minute rosettes—but the flowers that open on the nearly invisible stems above that cushion are as thin in petal as silk, their very stature and texture speak of crystal air, high places, freedom, uniqueness. Nothing humdrum, nothing overdone or blowzy, or repeated too often. We wait for blossoms, are enraptured by them, and then wait again for another season—fleeting, evanescent—all the qualities that are hard to capture or tame.

Plants from all the wild places—meadows, swamps, bogs, woodlands, as well as alpiners—are there to satisfy the yearning for flowers that are slender rather than fat; unusual rather than commonplace; elegant and graceful rather than bulky. When an alpine is well grown, it is said to be "in character," conforming to the ideal in the wild. Fertilizers, overwatering, too much cossetting, can change the height,

the size of the flowers, the very look of the plant. An alpine generally needs to be only a few inches high; a woodland plant graceful, not heavy.

Plants from the wild are my weakness, it's true, but I also garden just for the feel and the smell of it. Mere earth in spring can summon the heart as imperatively as the fragrance of any familiar flower. But the moment is at hand to reconcile the urge to grow plants with the need to spend more hours on other pursuits. Adjusting expectations, refocusing goals, coming to terms with what is rather than what is wished for—these are lessons I need to learn. No sooner said than the thought of a new planting of *Arisaema sikokianum* pops up, or a bank of species azaleas to transform a boring corner. How not to answer the challenge of convincing *Primula japonica* to settle in permanently by the stream? Who would willingly shun the prospect of more shrubs whose fragrance in season can suffuse the whole garden, or forego a recently discovered plant that quickens the blood? Did I just apply moderation? Or use the word reconcile? As long as there's life, let springs come, and let me at the trowel!

Catherine Hull gardens in Manchester, Massachusetts, with her husband Harry. Catherine specializes in alpiners, rock plants, and woodland wildflowers, and is a long-time member of the New England Chapter of NARGS. Photo by the author.

This article appeared in *Arnoldia* Spring 1995 and is published with the permission of the Arnold Arboretum. .

## ROCK GARDEN PLANTS OF NEWFOUNDLAND

—continued from p. 100

*Potentilla crantzii* and *P. nivea* are easy to cultivate and quite low, reaching to 10 cm. *Potentilla crantzii* produces a small mat of deep green leaves, each with five leaflets. It bears a mass of blooms in June. The diminutive *P. nivea* forms a little tussock of silvery, strawberry-like leaves and dainty, upright stems, each topped with a few 1-cm wide flowers. Normally, this plant has silver undersides to the leaves and green above, but I was fortunate to find a plant with silver on both leaf surfaces.

Several other natives that I found to be of easy culture are the various *Viola* species, *Campanula rotundifolia*, *Alchemilla minor*, *Erigeron hyssopifolius*, and the silver-white rosetted *Saxifraga paniculata* var. *labradorica*. *Cystopteris fragilis* and *Asplenium viride* are best grown in cracks filled with gritty peat.

Our native primroses are somewhat difficult to keep in the garden, but *P. laurentiana* will generally last about four years. Our *Gentiana* and *Gentianella* species are basically annuals and best left to gently self-sow around the rock garden.

Not to forget our native woody plants, I have had great success with *Dryas integrifolia*, and prostrate forms of *Potentilla fruticosa*, *Betula pumila*, and *Shepherdia canadensis* and several of our native arctic willows, namely *Salix reticulata*, *S. vestita*, and *S. candida*.

Unlike the relatively large, ever-green leaves of *Dryas octopetala*, our native dryas has small leaves which turn rusty in winter, making the plant look dead. However, come May, the plant turns green and produces flowers only slightly smaller than its larger cousin. The prostrate form of *Potentilla fruticosa* definitely has smaller flowers than its refined brethren, but what the

flowers lack in size, they make up for in abundance. The dwarf *Shepherdia* and *Salix candida* add nice silver accents to the rock garden. *Salix vestita* not only has lovely leaves on a low, 25 cm, globular shrub, but it has the added interest of large, orange overwintering buds. The dwarf birch is at its best in autumn when its leaves turn a blazing scarlet.

In certain years some of our native alpiners suffer, and a few plants perish. I feel that part of the problem with these more finicky alpiners is that in relatively warm areas the plants become overheated. In their natural state, these sea level alpiners are exposed to cool ocean breezes even during July and August. However, my garden is located in our capital city, St. John's, one of the warmer areas of the island. The extra heat encountered by alpiners growing here can be tolerated by some, but not all.

If you have the chance to visit Newfoundland, I highly recommend a trip to our Great Northern Peninsula to see these sea level alpiners for yourself. Unlike many mountain alpiners, you do not need to hike long distances over steep terrain—just step out of your car and stroll along the beach!

Drawings by Rebecca Day-Skowron

Todd Boland gardens in St. John's, Newfoundland. He is always on the lookout for something new, experimenting with new plants for Newfoundland. Space constraints in his small garden have inspired him to try more and more pot culture; his vegetable plot has recently been sacrificed to alpiners.

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## ERRATA

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Volume 53(3) p. 178, top. This plant should have been labeled *Campanula alpina* ssp. *alpina*.

p. 184, bottom. This photo was taken by Ted Cochrane. The Editor apologizes.

There may be an error in identification of a *Gaultheria procumbens* in the Vol. 54(1) issue.



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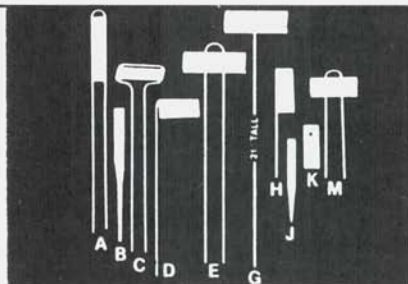
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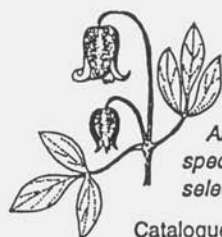
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