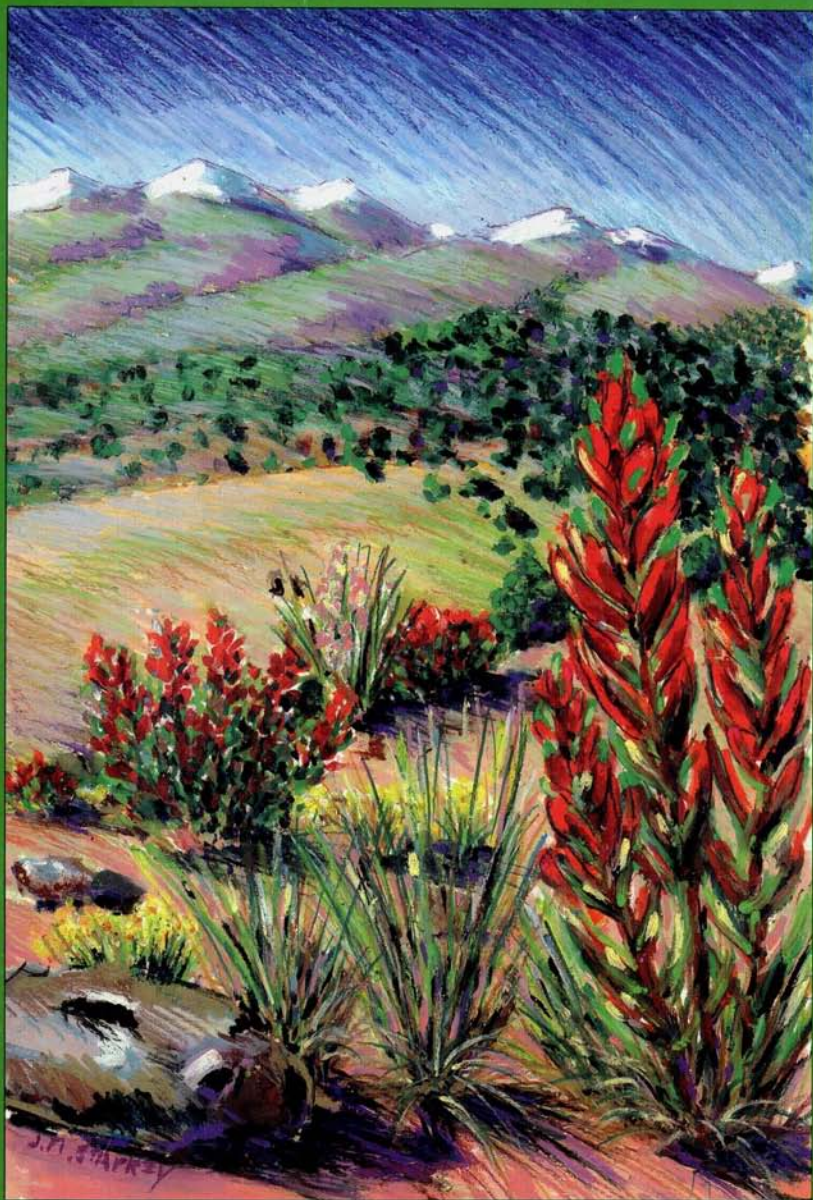


ROCK GARDEN



QUARTERLY

VOLUME 56 NUMBER 1

WINTER 1998

COVER: *Castilleja* in the La Garita Mountains
by Jill Starkey, Del Norte, Colorado

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Rhododendron 'Goldilocks'

RHODODENDRONS

FOR THE ROCK GARDEN

by Arthur P. Dome

The main concern really isn't what rhododendrons are suitable for the rock garden, but what rock gardens are suitable for rhododendrons. The correct environment is essential to have happy plants—and an unhappy rhododendron is not a pretty sight.

First of all, what is a rock garden? A good definition is

A rock garden should be a harmonious association of compatible plants and natural-appearing rock that are in proper scale to the surroundings. It should also provide a suitable place to grow and display these plants without the rocks unnecessarily monopolizing the landscape.

The following conditions should be considered in planning a good rock garden environment for rhododendrons:

There should be adequate light. The garden should be out in the open with no overhanging structures or branches. If the garden must be placed near large trees, make sure the lowest branches are high enough to let in adequate light. Also, consider what kind of competition for moisture and nutrients the roots of these trees will pose for your rhododendrons. If it is too dark where rhododendrons are planted, most will grow toward the light or become leggy; nor will they bloom as they should.

A rhododendron garden should have good drainage but never be allowed to dry out. The soil must always be kept moist to the depth of the root balls. Keep in mind that 'moist' is wetter than 'damp.' When we see or read about the native habitats of most of these plants, they are nearly always described as moist meadows, slopes, or hillsides. At the same time rhododendrons won't live long in standing water. A good way to test your drainage is to prepare a planting hole, fill it full of water, and wait to see how long it takes to drain. The drainage should be satisfactory if you are satisfied that it won't become a basin of water during the rainy seasons.

Allow enough space for your plants to grow up. Don't stuff a plant into too small an area. Know before you plant how wide and how high each plant may be in five or ten years.

The soil should be a loose, friable, humus-rich soil that won't pack or get hard and slightly acid in pH. It should be deep enough to encourage deep root growth from your plants. If the roots can grow deep, they are less apt to dry out. If the existing soil is too wet or heavy, and you still want to grow rhododendrons there, replace this soil with a more suitable soil. If that isn't practical, bring in suitable soil and raise the height of the planting area enough to accommodate the root balls of the plants. Get a soil mix that will be easy to water, one that the water will be more apt to soak into, rather than run off of, if the surface gets a little bit dry.

The rock garden should be where it is protected from the hot afternoon sun. Do not allow the soil and rocks where rhododendrons are growing to get hot. In the wild, alpine areas of their homes they usually grow in a cool environment, blanketed by fog or mist a good part of the time. In the low, woodland areas the forest canopy keeps them cool. Young plants and those with shallow roots can easily get stressed and die if the soil gets too hot around their roots. Eastern or southeastern slopes are ideal. Shade can be provided by hills, trees, fences, buildings, rocks—or anything. Sometimes a sudden surge of very hot weather in the spring after the plants have begun to grow can be devastating. In such crises, misting them with a fog nozzle can be very helpful, saving many from an early demise.

Even when planting rhododendrons considered suitable for your temperature zone, be aware of the damage that can be caused by untimely extreme cold and heat. Also, if some areas of your rock garden are subject to buffeting by strong winter winds, it would be a good idea to plant hardier plants there or to plan special protection for them. A good snow cover is the best protection, but plans can be made to use pots, boxes, burlap, blankets, branches from suitable conifers, or what ever it takes to protect your plant when needed. Even hardy plants can be damaged or killed by the sun reflecting off the snow in below-freezing temperature.

Sometimes there is a problem with animals wanting to dig in the soil around your small plants. One way to protect them is to place flat rocks or shale around the plant. As the plant grows, move the rocks outward and add more, if needed. Also, these flat rocks help keep moisture in and weeds down. Another idea would be to invert wire hanging baskets over your plants and make large staples from the hangers to secure the baskets to the ground.

If your rock garden has a suitable environment for growing rhododendrons, we then have to decide which plants to grow. Much depends on the size and slope of the garden. For small gardens, use small rocks and smaller plants; in a larger garden, larger rocks and larger plants are appropriate. Large areas with steep slopes and large rocks can make fine, terraced areas for larger-growing plants. Steeper, terraced planting areas are good for plants with floppy trusses and interesting indumentum on the undersides of the leaves, as you can look up at the flowers and leaves from below.

Many prostrate plants can grow over rocks or among small rocks. Planting rock walls with low rhododendrons can be interesting, but walls are much harder to keep moist, and some gardeners feel the effect isn't worth the effort.

In choosing your plants, be sure they are cold- and heat-tolerant for your area. If you know what USDA temperature zone you live in, use that as a guide. Also, it is advisable to visit other gardens in your area, both public and private. This is

also a good way to see how the different species and varieties of plants grow and how they look in a garden setting in your climate. Specialty rhododendron nurseries, where the sales people are knowledgeable about your area, can be a great help.

When you know how much space you have, how fast the plants you want will grow, and how soon you want the area filled in, then you will have an idea how many rhododendrons you will need.

Don't forget the companion plants that might be used for protection, complementing the blooming cycle of the rhododendrons, and providing year-round color in that part of your garden. Use companion plants that need the same conditions as your rhododendrons. Some of the herbaceous groundcovers are good for filling in space—and they are expendable as your woody plants grow. Discriminate pruning can help keep a rhododendron—or its companion—in-bounds and desirable for many years.

Following is a list of suggestions for rhododendrons appropriate for certain rock gardens. The information concerning approximate size in ten years, blooming period, shades of blooms, and foliage color and texture pertains to average, healthy plants grown in average or better-than-average conditions for soil, moisture, and light, as well as in normal or better winter and summer temperatures. Minimum low temperatures tolerated pertains to healthy plants that go dormant before sudden, extreme drops in temperatures. When the temperatures stay reasonably constant in spring until plants to break dormancy and start to grow and then cold weather hits, the effects can be devastating. Blooming periods indicated do not necessarily imply that one plant will be in bloom that entire time, but that plants will bloom at some time during that period, depending upon location and weather conditions.

Rhododendron campylogynum grows to about 12" tall, forming neat, compact plants with small, dark green leaves that are glaucous on the underside. It produces thimble-shaped flowers of various shades from light pink to dark red and purple. April–June. -10°F.

R. camtschaticum grows to about 8" tall, producing mauve to rose flowers above bright green foliage. May–June. I have had some that from time to time have borne a few flowers in September. There is also a white form that is very difficult to obtain. This species should have more water during its blooming and growing season than most rhododendrons. Do not be alarmed when winter comes, and it starts to lose its leaves; it is deciduous. +5°F.

R. cephalanthum is also a compact plant, with dark green, aromatic foliage. It produces pinkish flowers in little trusses at the tips of its branchlets. April–May. -5°F.

R. charoepum var. 'Patricia' (now *R. campylogynum* Charoepum Group, 'Patricia') is an upright plant to about 2', with dark, olive-green foliage. It has loose trusses of reddish-purple flowers in May. +5°F.

R. forrestii var. *repens* (now *R. forrestii*, Repens Group, photo, p. 18) has a prostrate, creeping habit of growth. It has dark green foliage and produces large,

scarlet flowers. March–April. 0°F.

R. glaucophyllum is an upright plant with dark green leaves that are glaucous on the underside. This plant can reach 2' or more in height. The campanulate flowers come in loose trusses of white, pink, rose, and rosy-purple. April–May. 0°F.

R. hirsutum has bright green leaves, the edges of which are hairy or bristly. It grows to about 2'. It has little, upright trusses of pink to rose-pink flowers. June–July. It is said to tolerate alkaline soils. –15°F.

R. intricatum (photo, p. 17) is a compact plant with dark green leaves that are paler green on the underside. It can reach a height of 2' and is much broader than it is high. It has small, lavender-blue flowers, usually during April. –15°F.

R. keiskei var. 'Yaku Fairy' is a real gem, forming low, spreading, compact plants with bright green foliage. It is smothered with lemon-colored flowers in April–May. A 10-year-old plant may be 6" high and 20" across. –5°F.

R. keleticum (now *R. calostrotum* ssp. *keleticum*) is a low-spreading plant that may reach a height of 12". It has dark green foliage and rich crimson flowers during May–June. –15°F.

R. kiusianum is one of the small-leaved azaleas that really fit into the rock garden setting. They are neat, compact plants, mostly with a spreading, mounding habit, although a few have an upright habit. They vary from 8–18" high. Flowers usually appear in May, and there are many named varieties with different shades of pink, red, or purple flowers. There are some good white forms also. –10°F.

R. ludlowii is a superb little plant and a parent of many fine hybrids. It grows in mounds and rarely reaches 12" high. The flowers are a good yellow with reddish spots, appearing singly or in pairs during April–May. It is not an easy plant to grow. –10°F.

R. luteiflorum is an upright plant growing to about 2', with dark green leaves that are glaucous on the underside. It has brilliant, bright yellow flowers April–May. –5°F.

R. megeratum is a fine plant with a mounding, compact habit, and it may achieve 18" in height. Its new growth is a bluish-gray green and hairy. It has bright yellow flowers April–May. +5°F.

R. microleucum (now *R. orthocladum* var. *microleucum*) is an upright plant to about 18" tall. It has small, dark green leaves that are paler on the underside. It has pure white flowers appearing in little trusses April–May. –5°F.

R. mucronulatum 'Crater's Edge' is a dwarf form that reaches a height of about 18" with dark green, deciduous leaves. It produces an abundance of deep magenta flowers during January–February, weather permitting. –15°F.

R. pemakoense has been a reliable favorite for a long time. Its mounding habit of growth, adorned with dark green leaves, usually reaches about 12" high. During March–April it can be entirely covered flowers, borne singly or in pairs, in shades of pink or a pinkish-lavender. In some areas, late spring frosts turn the blossoms brown. 0°F.

R. pumilum is (photo, p. 17) is a neat, small, slow-growing, compact plant with dark green leaves that are glaucous and light on the underside. It seldom gets 12" tall. Its small, campanulate flowers can range from pink to rose and appear in little trusses of 2–3 blooms. –5°F.

R. prostratum (now *R. saluenense* ssp. *chameunum* Prostratum Group) is a low-growing plant with shiny, green foliage. It can reach 18" high, and the new growth is covered with bristly hairs. The flat, open-faced flowers are crimson to deep rosy-purple, appearing in groups of one to three at the tips of the branchlets during April–May. *Rhododendron radicans* is often sold as *R. prostratum*, but it does not have the bristles on the new growth. –5°F.

R. radicans (now *R. calostrum* ssp. *keleticum* Radicans Group) forms mounds or mats with tiny, bright green leaves, and it ranges from 3–6" high, depending upon the form. The flowers are usually solitary, broadly funnel-shaped, and purplish to rosy-purple. May–June. –10°F.

R. trichostomum is an open, upright-growing plant to about 30", with dark green, aromatic foliage. The flowers are held in dense, compact trusses, similar to those of daphnes, and colored white, pink, or rose, usually appearing in May. –5°F.

R. williamsianum is a slow-growing plant that always brings favorable comments from viewers. It is a mounding, compact-growing plant with small, bright green,



Rhododendron pemakoense

round to ovate leaves. It doesn't produce its pink, bell-shaped flowers at an early age, but its shiny, chocolate-colored new growth in the spring makes up for the under-abundance of flowers. It blooms April–May. –5°F.

R. 'Bric-a-Brac' is a longtime favorite. It is a low-growing plant with dark green leaves rimmed with fine hairs, and it can reach a height of 2'. It has white flowers with some shades of blush which can really cover the plant February–March. That is, if weather permits—an early frost can easily turn the blossoms brown. +5°F.

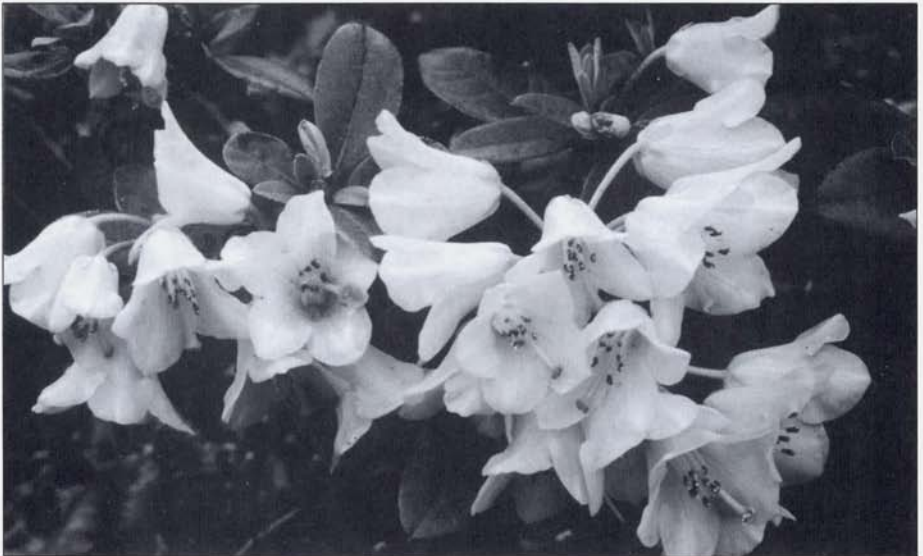
R. 'Carmen' is a spreading, compact plant with shiny, green leaves that gets about 12" high. It can flower at an early age, producing dark red flowers April–May. 0°F.

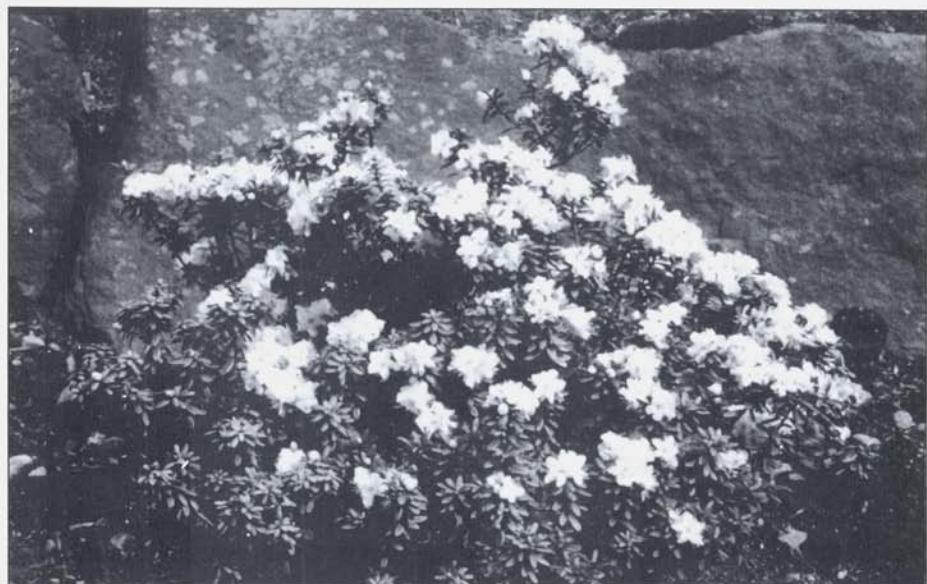
R. 'Curlew' (photo, p. 18) is a very fine plant of compact-spreading habit, with dark green leaves, and it can reach a height of 18". It covers itself with the most brilliant yellow flowers April–May. It is one of the best of the dwarf yellows. Hardy to –5°F.

R. 'Egret' is a compact plant with dark green leaves that can reach a height of 18". It covers itself with tiny, pure white flowers in May. –5°F.

R. 'Ernie Dee' is another low-spreading plant that usually gets about 12" high, with dark green leaves. Its purplish flowers are long lasting and appear April–May. 0°F.

R. 'Ginny Gee' is a fine, compact, mounding plant with dark green leaves that can reach a height of 18". It can smother itself with tiny, pink flowers in April. I have seen large specimens of this plant growing in the full sun that showed no signs of stress, as most rhododendrons might. 0°F.





Rhododendron microleucum

R. 'Goldilocks' (US origin) is an upright plant to 2', with dark green leaves. It covers itself with small, bright, golden yellow flowers in May. 0°F.

R. 'Merganser' has a semi-upright habit of growth, reaching about 18" high, with dark green leaves. It produces small trusses of deep yellow, thimble-like flowers in May. -5°F.

R. 'Patty Bee' is an excellent, mounding plant and can grow to 18" high. It does well in full sun, once established. It produces an abundance of yellow flowers from April to May. -10°F.

R. 'Pipit' is an interesting little plant and is very difficult to grow. It can reach a height of about 12", and its small leaves can be deciduous, depending upon the weather. It produces single, flat, pinkish flowers in late May. +5°F.

R. 'Ptarmigan' is a very satisfactory plant that seems to do well in most growing conditions, including light soil, heavy soil, full sun and shade. It has dark green leaves and a compact, mounding habit to 18". It produces numerous, pure white flowers March-April. They seem more resistant to late frost damage than most other plants blooming at this time. -5°F.

R. 'Razorbill' is a very interesting plant with dark green, crinkled leaves. It can reach a height of 2' and produces trusses of numerous, rosy-pink, tubular flowers April-May. +10°F.

R. 'Red Red' is an evergreen azalea that can, in time, reach 18" high. It is very floriferous, producing the brightest red flowers in May. 0°F.

R. 'Shamrock' is a low, compact, mounding plant that can grow to 15" tall. It covers itself with greenish-yellow flowers April–May. –5°F.

R. 'Small Gem' is a fine, compact plant with light green leaves that can reach a height of 18". It produces numerous, white flowers with a slight blush in April. –5°F.

R. 'Wagtail,' a difficult plant to find, produces mats about 6" high of shiny green leaves that can be deciduous, depending upon the weather. It is covered with pale yellow flowers in May. 0°F.

R. 'Wee Bee' is a compact plant that can reach a height of about 12" or more. It is usually two or three times as wide as it is high. It has dark green foliage and covers itself with flowers in shades of red to pink. April–May. +5°.

R. 'Widgeon' is a compact, upright plant reaching a height of about 2'. It produces numerous, saucer-shaped, pinkish flowers in May. –10°F.

R. 'Wren' is a low, slow-growing, spreading, compact plant that can reach a height of 12". It has clear yellow flowers April–May. It is one of the better low-growing yellows. 0°F.

There might be other rhododendrons suitable for rock gardens that you'd like better after seeing them in your local gardens and nurseries. Again, visit the nurseries that have the selection and the people that are knowledgeable about rhododendrons. Don't overlook the mail-order nurseries that carry a selection of rhododendrons. Most have catalogs with many beautiful color pictures of their plants, along with a wealth of information about rhododendron care and culture. These catalogs are worth every penny you might have to pay for them.

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Arthur Dome lives in Seattle, Washington, on an east-facing hillside a few blocks from Lake Washington. He gardens mostly in the open—although his garden is shielded from hot afternoon sun. The temperature seldom falls below 20°F in winter, and there is little snow. Art also enjoys photographing these plants; the photos accompanying this article are his work. Art has been interested in the Ericaceae since high school.

COMPANION PLANTS FOR RHODODENDRONS

Many plants can be used with rhododendrons as companion plants. Some important factors to consider are: they should be plants that will grow well in the same environment as the rhododendrons—soil, light, location and temperatures requirements should be compatible. The habit and rate of growth should be comparable to that of rhododendrons.

- Companions can enhance a planting as by creating a background or one may use a single, larger specimen among smaller plants for emphasis.
- Don't overlook the option of using plants that bloom when the rhododendrons are not in flower. Some gardeners even use annuals to brighten the summer season.
- Various conifers make good companions.
- Other members of the Ericaceae family make ideal companion plants, as in most situations their requirements are the same. One might consider species and varieties suitable for your area from the following:

Andromeda glaucophylla, *A. polifolia*

Arbutus andrachne, *A. menziesii*, *A. unedo*, *A. xalapensis*

Bruckenthalia spiculifolia

Calluna vulgaris (many cultivars)

Cassiope fastigiata, *C. hypnoides*, *C. lycopodioides*, *C. mertensiana*, *C. selaginoides*, *C. stellerana*, *C. tetragona*, *C. wardii*

Chamaedaphne calyculata

Daboecia azorica, *D. cantabrica*

Epigaea asiatica, *E. repens*

Erica (see article, p. 21–26)

Enkianthus campanulatus, *E. cernuus*, *E. chinensis*, *E. deflexus*, *E. perulatus*, *E. subsessilis*

Gaultheria adenothrix, *G. antipoda*, *G. cuneata*, *G. depressa*, *G. forrestii*, *G. hispida*, *G. hispidula*, *G. hookeri*, *G. humifusa*, *G. itoana*, *G. miqueliana*, *G. nummularioides*, *G. oppositifolia*, *G. ovatifolia*, *G. procumens*, *G. pyroloides*, *G. rupestris*, *G. semiinfera*, *G. shallon*, *G. sinensis*, *G. tetramera*, *G. trichophylla*, *G. veithiana*, *G. wardii*, *G. yunnanensis*.

Gaylussacia brachycera

Kalmia angustifolia, (cultivars), *K. microphylla*, *K. polifolia*

Kalmiopsis leachiana

Ledum (=Rhododendron) *glandulosum*, *L. groenlandicum*, *L. palustre*

Leucothoe davisiae, *L. fontanesiana*, *L. keiskei*, *L. populifolia*

Phyllodoce aleutica, *P. breweri*, *P. caerulea*, *P. empetriformis*, *P. glanduliflora*, *P. nipponica*

Pieris floribunda, *P. forrestii*, *P. formosa*, *P. japonica*, *P. nana* (=Arcterica)

Rhodothamnus chamaecistus

Vaccinium caespitosum, *V. corymbosum*, *V. delavayi*, *V. macrocarpum*, *V.*

myrsinites, *V. myrtilloides*, *V. numullaria*, *V. oxycoccus*, *V. vitis-idaea*

Zenobia pulverulenta

RHODODENDRONS BY WINTER-COLD HARDINESS

Hardy to +10°F

R. 'Razorbill'

Hardy to +5°F

R. 'Wee Bee'

R. 'Bric-a-Brac'

R. 'Pipit'

R. camtschaticum

R. campylogynum, Charoepum Group, 'Patricia'

R. megeratum

Hardy to 0°F

R. 'Carmen'

R. 'Ernie Dee'

R. 'Ginny Gee'

R. 'Goldilocks'

R. 'Red Red'

R. 'Wagtail'

R. 'Wren'

R. forrestii, Repens Group

R. glaucophyllum

R. pemakoense

Hardy to -5°F

R. 'Curlew'

R. 'Egret'

R. 'Merganser'

R. 'Ptarmigan'

R. 'Shamrock'

R. 'Small Gem'

R. keiskei var. 'Yaku Fairy'

R. cephalanthum

R. luteiflorum

R. orthocladum var. *microleucum*

R. pumilum

R. saluenense ssp. *chameunum*, Prostratum Group

R. trichostomum

R. williamsianum

Hardy to -10°F

R. 'Patty Bee'

R. 'Widgeon'

R. calostrum ssp. *keleticum*, Radicans Group

R. campylogynum

R. kiusianum

R. ludlowii

Hardy to -15°F

R. calostrotum ssp. *keleticum*

R. hirsutum

R. intricatum

R. mucronulatum 'Crater's Edge'



Hachmann Nursery, in Barmstedt, Germany. Hans Hachmann and his son Holger operate one of the largest nurseries in continental Europe that specializes in woody plants. They feature the Ericaceae, mostly rhododendrons. They have introduced and registered more than 218 top quality rhododendron hybrids. Their very fine display garden, where one can view many desirable, unusual, and rare plants being superbly grown, above, the rhododendrons, below heathers.





Art Dome's terraced hillside in Seattle, Washington, above. Dwarf and slow-growing ericaceous plants from *Andromeda* to *Zenobia* are represented; with *Corylopsis*, *Primula*, and *Saxifraga* (pp. 3–26).

Jim and Bev Thompson's 2.5-acre garden on the coast north of San Francisco. They grow many fine trees and shrubs. Their half-acre front yard, below, contains most of their over 250 varieties of heaths and heathers, with about nine plants of each variety grouped together.





Above, Jack Todd garden, Victoria, British Columbia, see Vol. 55(4), pp. 287–8, 291. Photos, Art Dome

Glen Patterson garden, below, West Vancouver, British Columbia, on the shores of English Bay . A peaceful forest setting and natural rock outcroppings create a diverse environment for many native and exotic ericaceous plants and a superb selection of woodland and rock garden plants.





Above, Crail Gardens in Newstead Abby Park (adjacent to Ravenshead), Nottinghamshire, England. The garden of Mr. and Mrs. Frank Groome. Massive plantings of heathers, conifers, heathers, rhododendrons, and other woody plants. A small stream meanders through the lower garden. then enters a rock garden with several small ponds and water falls. Photos, Art Dome.

Below, Wolf Neck Farms, Freeport, Maine, at University of Southern Maine conference center.





Rhododendron intricatum (p. 6)

Photos, Arthur Dome

Rhododendron pumilum (p. 7)





Rhododendron x 'Curlew' (p. 8)

photos, Arthur Dome

Rhododendron forrestii, Repens group (p. 5)





Trough with *Eschscholtzia caespitosa*, *Oxalis obtusa*, *Nemophila menziesii*, in Hale garden, Portland, Oregon. (p. 28)

Concrete trough with *Anchusa caespitosa* and *Primula acaulis* (p. 28)

Photos, David Hale





Hale garden, Portland, Oregon (pp. 27–30)

Photos, David Hale



HEATHS AND HEATHERS

by Arthur P. Dome

The heaths and heathers can be a very desirable group of plants for most of the temperate regions of North America. The term heather generally refers to both *Erica* and *Calluna*; the heath, belonging to the genus *Erica*, has needle-like leaves and a colored corolla. Heather, of the genus *Calluna*, bears scale-like leaves and the showy color is borne in the calyx.

With proper selection one can have various cultivars of these plants in bloom the year around on the West Coast. Some areas of the East Coast may come close to achieving this goal. The Midwest and Rocky Mountain areas are limited to the most hardy varieties, which must be able to tolerate more alkaline soils as well as colder winter temperatures.

The colors of the various blooms range through nearly all the shades—except yellow, orange, and true blue. One can find prostrate-growing plants that seldom reach above 3" in height or tree heaths that may achieve 15' in certain areas of the Pacific Coast.

Foliage colors really enhance the desirability of these plants. There are rich greens to olive greens, gray to silver hues, and there are yellow to gold-

en-colored varieties that turn red or russet during the winter. The colder the weather and the brighter the sunshine, the more vivid foliage and flower colors become.

All these plants do best when they receive at least a half a day of direct sunlight. The soil should be a light, friable, and high in organics, one that is well drained but NEVER DRIES OUT. Generally heaths and heathers prefer an acidic soil. One of the British Heather Society publications lists which species need or will tolerate different soil pH levels:

Plants that must have an acid soil (pH 5.0–6.5): *Calluna vulgaris*, *Erica australis*, *E. ciliaris*, *E. cinerea*, *E. mackaiana*, *E. tetralix*, the summer blooming hybrids, and *Daboecia*.

Plants that will grow in a neutral pH 7 soil: *Erica vagans*.

Plants that will tolerate an alkaline soil (pH 7–7.8): *Erica arborea*, *E. carnea*, *E. erigina*, *E. lusitanica*, *E. umbellata* and the *Darleyensis* hybrids. *Erica arborea*, *E. erigina*, *E. lusitanica*, and *E. umbellata* are usually only satisfactory in certain

maritime regions of the Pacific Coast.

The pH of certain soils can be lowered using wettable sulfur or products with sulfate-sulfur in them, such as aluminum sulfate, iron sulfate, magnesium sulfate, and iron chelates. The pH of certain soils can be raised by using ground limestone (calcium carbonate) or dolomitic limestone (calcium magnesium carbonate). Consult your local Department of Agriculture Extension Agent about rates for your soil type.

Two- to three-year-old plants and those up to one- or two-gallon size are the most satisfactory to plant out into the garden. They can be planted any time of the year when the soil can be worked and when they won't wilt. Plant them so the top of the root ball is even with the settled soil; they will not tolerate being buried too deeply. If the plant has become root-bound in the container, try to unwind the roots and work soil into the root ball to hold the roots apart. Container-grown plants that appear to be on the dry side should be soaked in water until there are no more air bubbles coming out of the root ball. The moisture in the root ball should be greater than that of the soil into which it is being planted.

Most of these plants should be pruned or sheared after all chance of a freeze has past. This helps keep them from becoming unsightly, helps keep them in bounds, and forces them to produce more blooms. Hedge shears or cordless grass trimmers are usually best, except for the tree heaths; those should be pruned with a pair of hand pruners. The heavy-blooming heathers like *Calluna* should be cut back to just below where the blooms started the previous year, because no new growth will come out from the stems which bore flowers the previous year. It is

especially important to cut back young plants, as this forces new growth to develop from the center of the plant. This helps prevent the plants from turning bare and brown in the center as they get older. In the case of the tree heaths, pruning prevents them from developing bare, leggy trunks or branches.

Feed your heaths and heathers with a fertilizer recommended for rhododendrons, preferably one with a 10-8-6 Nitrogen(N)-Phosphate(P)-Potassium (K) ratio with minor elements. It is best to place the fertilizer just outside the root ball area (none on top of the roots) and water it in. With chemical-based fertilizers an application that looks like a light frost on the ground is a good rate to start with. Organic fertilizer might require a heavier application. Plants that have grown together into drifts usually do not need feeding. A fall feeding, at the right time, is considered by some to be the most beneficial. Feeding at this time helps promote root growth, rather than top growth, which helps the plants survive better when a dry summer follows. Also, the first new growth in the spring comes from food stored in the roots, so that fall feeding gives the plants a jump-start.

Dogs, moles and some kids probably do the most damage to these plants, and the EPA has nothing registered to control these pests. In some areas various root weevils can be a problem; these can be controlled with certain plant-protecting products. Whether using chemicals or nematodes, be sure to follow the label directions for timing and rates. In some situations root diseases can be a problem, and for these there is no sure cure. The best way to avoid root problems is to obtain healthy plants, plant them immediately in the right environment, and don't subject them to stress.

It is easy to propagate heaths and heathers. The best way is to take inch-and-a-half to two-inch cuttings in August and September, when the wood becomes firm enough. After removing the leaves from the lower part of the cutting, stick it in your favorite rooting medium. Protect the cuttings from the weather, and don't let them dry out. Root-inducing hormones usually are not needed. When rooted, transplant the cuttings into pots or growing flats and grow them on for a year or two before planting them out into the ground. While in the pots or growing flats feed the little plants, as needed, with water-soluble plant food such as a 30-10-10 mix at the rate of one teaspoon per gallon. After the plants have started to grow pinch off the tips of the new growth to induce branching.

Following is a condensed list of some of the species and their most popular varieties, usually available in nurseries and garden centers, especially when they are in bloom. It is a good idea to visit more than one nursery at different times of the year to get a better idea of all that is available in your area.

The cultivars of the true Scotch heather, *CALLUNA VULGARIS*, form a very diverse group of plants, which are well adapted to most of the gardens in temperate North America. One can grow double-flowered or single-flowered ones, miniatures or dwarfs, prostrate or tall ones. The color of the foliage can vary from light green to dark green, olive-green to silvery green. At different times of the year they may change to yellow or golden or russet. With the proper selection one can usually have callunas in bloom from June into November in USDA Zone 4.

Those with the double flowers are usually the most popular. 'County

Wicklow' is a neat little shrub with shell-pink flowers growing to about 12" tall with dark green foliage. 'Kinlochruel' has the same habit of growth but with pure white flowers. 'J. H. Hamilton' is a little smaller with pure pink flowers and olive-green foliage. 'Tib' has deep pink flowers. 'H. E. Beale' is an old-timer with 12-15" sprays of light lavender flowers. The double-flowered forms can really enhance floral arrangements and corsages.

Those wishing some of the taller, more upright callunas (24" and up) will find the following plants good for the garden: 'Corbett's Red' has a lot of crimson flowers. 'Mair's Variety' has white flowers with dark green foliage, and 'Silver Knight' has silver-gray foliage with lavender flowers.

The miniature or dwarf callunas are an interesting group, but one doesn't grow them for their flowers. Some that you might like to consider that hardly ever get over 4" tall are 'Foxii Nana', 'California Midge', and 'Sedlanov'.

There are some prostrate types, usually in the 2-4" height range, which are more prolific. A few of the nicer ones are 'Mrs. Ronald Gray', with mauve-colored flowers; 'Sister Ann', with silvery gray foliage; and 'White Lawn', with white flowers and bright green foliage.

Callunas that have foliage colors in various shades of yellow, gold, orange, russet, and red at different times of the year always create a good deal of interest. These colors are really enhanced in the spring, when the weather is bright and sunny, and the air temperatures are near freezing. Usually the flowers of these plants are insignificant. The following cultivars can be quite showy: 'Aurea', with golden foliage in the summer and copper-red in the winter; 'Beoly Gold' has yellow foliage all year with white

flowers; 'Blazeaway' has foliage that is golden in the summer, turning to orange and brilliant red in the winter. 'Robert Chapman' has golden foliage in the summer, turning orange in the autumn, then red in the winter and spring. They grow about 12" tall and spread to about 24". 'John F. Letts' only gets about 4-6" tall and has golden foliage in the summer turning bronze in the fall, then orange to red in the winter.

ERICA X DARLEYENSIS is a hybrid group (*E. carnea* x *E. erigina*) that has many fine cultivars with flowering periods from late fall into the following spring. The height of the growth can be from 8-18" high, with a spread of up to 36". These plants are most adaptable when it comes to soil type and location. For many years they have been sold by some as 'Med-white' and 'Med-pink'. Some of the better pinkish forms are 'Darley Dale', 'Furzey', 'George Rendall' and 'Ghost Hills'. A popular white form is 'Silberschmelze', and there is a new, deep red form from Germany called 'Kramer's Red'. These are hardy to Zone 5.

ERICA CARNEA is another popular species with different cultivars blooming from December into May. Most of them spread quite quickly, and they

very seldom get over 6" high. One of the most popular is 'Springwood White', which is a prolific bloomer with bright green foliage. 'Foxhollow Fairy' is a nice bicolor pink with dark green foliage. 'Myretoun Ruby' has blooms that vary from heliotrope to crimson with dark green foliage. 'Porter's Red' has magenta-colored flowers with dark green foliage. 'Sherwood's Early Red' has ruby-colored flowers, dark green foliage, and is one of the earliest blooming of the species. The shades of color in the flowers of these heaths can vary quite a bit, depending upon the combination of cold temperatures and bright and sunny weather. These are hardy to Zone 5.

ERICA ERIGINA has various cultivars that bloom from January into June. They are slower growing shrubs that have more of an upright habit of growth and can reach up to 36" in time. 'W. T. Rackliff' has white flowers and rich green foliage. 'Irish Dusk' is one of the earlier flowering in the species, with salmon-colored flowers that develop into clear rose pink; it has dark gray-green foliage. 'Golden Lady' has white flowers and golden foliage most of the year. Hardy to Zone 9.

THE TREE HEATHS are always of interest in any garden where one has the



Erica 'H.E. Beale' before and after pruning

conditions to grow them. They need a warmer garden, one that is protected from the cold winter winds, and where one can get out to keep the snow from breaking them down. Also, the first three or four years one should keep nipping out about an inch or so of the new terminal growth to induce branching so the plants don't develop just a few bare, leggy trunks. *Erica lusitanica* (Zone 8) can reach 6-8' tall and blooms January to April with deep pink buds that develop into white flowers. *Erica arborea* (Zone 7) is usually the easiest to grow and is capable of growing to over 10' tall. It develops long sprays of white, slightly fragrant flowers during March and April. *Erica australis* (Zone 9) can reach 8', with pink flowers, and there is a white-flowered form called 'Mr. Robert'. *Erica terminalis* (Zone 5) is the hardiest of the larger-growing, hardy heaths. It can get up to 6' tall, with lilac-pink flowers from July through October.

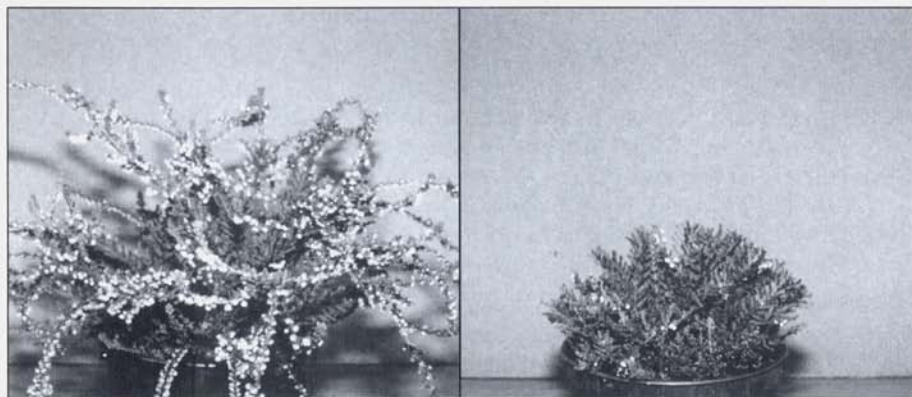
ERICA CINEREA has many fine cultivars that grow 6-18" tall, some having very vividly colored flowers May through September. 'C. D. Eason' is a very popular one with bright magenta flowers. 'Eden Valley' always brings comments with its bicolor white-and-lavender flowers. 'Golden Drop' is a more compact-growing plant with

mauve-colored flowers and golden foliage that can turn deep red in the winter. 'P. S. Patrick' has brilliant, vivid purple flowers and dark green foliage. 'Pink Ice' is also a compact growing plant with rosy-pink flowers and dark green foliage. 'Velvet Night' has deep beetroot-colored flowers and dark green foliage. These are hardy to Zone 5.

Erica mackaiana is an interesting little shrub blooming July into October. Different cultivars grow from 6-10" tall. 'Dr. Ronald Gray' has white flowers and medium green foliage. 'Plena' has double, magenta flowers and dark green foliage. 'Shining Light' grows the tallest of the three, with shining white flowers and medium gray-green foliage. Try these as far north as Zone 6.

ERICA SPICULIFOLIA (formerly *Bruckenthalia*) grows about 6" tall and blooms June to July. It has pale rose-pink flowers and dark green foliage. Zone 4.

ERICA TETRALIX is a compact, upright-growing plant with interesting grayish-green foliage and has cultivars that grow 6-12" tall with blooms June into October. 'Alba Mollis' is a slower-growing form with waxy white flowers and silvery new growth. 'Con Underwood' has large, magenta flowers, sometimes blooming into



Erica 'P.S. Patrick' before and after pruning

November. 'George Frazer' is a popular cultivar with pale pink flowers. 'Pink Star' has lilac-pink flowers and spreads more rapidly than most in this species. Zone 3.

ERICA CILIARIS is an interesting species with its leaves edged with fine hairs. It has a spreading habit of growth with various cultivars growing from 6–24" tall. Its flowers are larger than most of the hardy heaths, and they show color from June into November. 'Corfe Castle' has rose-pink flowers and medium-green foliage. 'David McClintock' is a bicolor with white-and-beetroot-colored flowers and gray-green foliage. 'Stoborough' is a fine, upright-growing plant with white flowers. 'Wych' is a smaller, slower-growing plant with shell pink flowers and medium green foliage. Zone 7.

ERICA VAGANS is quite versatile when it comes to soil, adapting quite well to heavy soils. Cultivars grow from 9–24" tall and spread quite well, flowering from June into November. 'Alba' is a prolifically blooming white with medium green foliage. 'Mrs. D. F. Maxwell' is an old-timer and still one of the best, with its deep rose-pink flowers and dark green foliage. 'Pyrenees Pink' is a little more compact, with deep pink flowers and dark green foliage. 'St. Keverne' has pure pink flowers and dark green foliage. These grow as far

north as Zone 5.

DABOECIA CANTABRICA is the Irish heath, which has larger leaves than those of *Erica* species, including forms growing 10–20" tall and spreading. The flowers are also much larger, showing color from May into November. 'Alba' is a fine, white-flowering form with glossy green foliage. 'Praegerae' has deep cerise or cherry red flowers with dark green foliage. A hybrid *Daboecia* named 'William Buchanan' is a more compact, slower grower with deep crimson flowers. Zone 6

Those of you wishing to learn more about these plants and how they grow in your area might consider visiting nurseries, parks, botanical gardens, or the gardens of friends that have a good selection. Don't be afraid to ask questions about the different forms and their culture.

There are nearly 300 different cultivars of the heaths and heathers available from growers in North America. Sometimes one must contact a specialty grower for some of the newer, rarer, more unusual varieties. Here are three mail order growers that have a good selection of fine heaths and heathers. The plant lists and/or catalogs from these three nurseries contain a wealth of information about these plants and their culture.

MAIL ORDER GROWERS

Heaths and Heathers, E 502 Haskell Hill Rd, Shelton, WA 98584-8429

Tel. (360)-427-3518, E mail <handh@heathsandheathers.com>

Glenmar Heather Nursery, PO Box 479, Bayside, CA 95524

Tel. (707)-268-5507 E mail <glenmar@humbolht1.com>

Rock Spray Nursery, PO Box 693, Truro, MA 02666-0693

Tel. (508)-349-6769, E mail <kherreck@rockspray.com>

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GARDEN ARTIFICE:

THE UNNATURAL GARDENER

by David Hale

Once while I was being shown through a very lovely garden near Vancouver, British Columbia, one of the owners remarked that they interfered as little as possible with the natural setting. They had placed rocks on an existing slope and covered pathways with gravel. However, except for those small changes the plants had to make do with the pre-existing soil and put up with the weather conditions.

Gradually as I walked through the garden I became aware that although this was their honest perception, it was far from the truth. The gardeners had taken advantage of many microclimates in the placement of their plants by, near, in front of, or behind rocks. Here there was a net over a plant or a basket perhaps; several panes of glass protected plants from rain. And then, clearly in violation of Mother Nature, were several frames with covers, offering a variety of habitats.

This all seems very sensible to those of us who love to garden and grow a wide variety of plants. We've made the task even more difficult by choosing to grow a high percentage of alpine plants. That is, plants that grow on mountains above tree line.

Quoting from Frank Kingdon-Ward in his book *The Romance of Plant Hunting*, "There are too many ignorant folk at home clamoring for plants from above a certain arbitrary altitude; who maintain that unless a new introduction comes from above 13,000' or 14,000', it will not prove hardy in England; and conversely. That if it comes from above that altitude (I am speaking more particularly of Asia between the latitudes of 25° and 35°N), it will be hardy. This is ridiculous." And later, "At moderate elevations, such as 10,000' to 13,000', plants have a much greater range of altitude than people imagine. A range of 5,000' for a species is by no means rare and 3,000' or 4,000' is common. These plants are elastic. Their constitution is more adaptable than those which are sensitive to comparatively small changes of altitude." And again later, "Above a certain altitude, the number of species met with rapidly decreases; and those few are highly specialized. They are stereotyped; their habits are fixed. Change kills them."

At middle altitudes, subalpine and lower, plants are used to change at any season. They experience patterns of

freezing and thawing, snow followed by rain, for example, more like our gardens. Above this level the plants are reliably covered by snow and are dry for 3–6 months at a temperature which is relatively constantly near freezing. These are difficult conditions to reproduce in the garden.

European alpinists have a reputation of being easier or more reliable to grow. I feel this is because they have been filtered through British gardens. The difficult ones die (or at least are very rare) and the others grow on and are passed on to us.

I believe that if you collected seed of 100 alpine plants from mountains of the world, European, Asian, New Zealand, or South America, and treated them equally you would find only 10–20% amenable to regular, unprotected rock garden culture and perhaps another 20–30% to specialized culture—garden artifice.

While we would all prefer to garden without all of these habitat modifications, eventually, through a desire to grow the ungrowable plant, we succumb. The Czechs love their crevice gardens and tout them highly. They have discovered that crevices, or convenient places below, behind, or in front of rocks can change air flow, temperature of the soil, moisture flow, and light exposure. It is an early modification one can make in the garden to provide additional microclimates.

We get our coldest weather with east winds in the winter. So a plant that's not hardy with eastern exposure will perhaps be hardy tucked under the western edge of a rock. And the rock can still be low enough that the annual parts of the plant are exposed to full sun.

I use a small range of soil mixes. The rock garden soil is a mixture of 1/4" minus crushed rock (sizes that go through a 1/4" commercial screen,

with smaller sizes included) in a proportion of about 60–65% to 35–40% loam. In the shadier parts of the rock garden I add a little peat to the above mix, for instance where I might grow Ericaceae.

Along my driveway I have a row of old galvanized wash tubs. They contain bulbs such as *Fritillaria purdyi*, *F. glauca*, *F. recurva*, *F. verticillata*, *F. pontica*, *Calochortus amabilis*, *C. luteus*, *C. albus*, and *C. venustus*. These tubs are taken into the garage for the winter. I top-plant the tubs with seeds of annual natives that otherwise would have to be grown and planted out annually. I sprinkle seed straight from the packets onto the grit in January. *Nemophila menziesii*, *Clarkia pulchella*, *Linum grandiflorum*, and *Eschscholtzia caespitosa* (photo, p. 19) make a nice showing through spring and summer without interfering with bulb growth. The rims of the tubs catch the seed of the annuals and allow them to re-seed. I move the tubs inside in winter to protect the bulbs from freezing, and therefore I can also tuck in the occasional half-hardy plant or small shrub.

Also I move in several troughs. This protects the plants from the sometimes continuous rain, as we get 80% of our rain in four months in the winter. Alpines generally don't tolerate this. Also, many alpinists are not tolerant of extremely cold temperatures, because here in Portland they lack their mountain blanket of snow. *Origanum microphyllum* is not hardy and decorates one of these "migrating" troughs. In a shadier trough I grow *Pinguicula grandiflora* and some of the tiny *Celmisia* species that do not otherwise tolerate our winters.

The soil mix that I use in the troughs and galvanized wash tubs that are moved inside in winter contains 50% perlite to make them lighter. In fact, in the hypertufa concrete trough

construction, I substitute perlite for the sand.

Most of my troughs are watered by drip, rather than overhead, irrigation, to keep the crowns of the plants dry. Here some difficult alpiners do satisfactorily, including *Campanula piperi*. Some small, common plants that are much easier to see and appreciate are also planted, such as *Talinum okanogansense* (now *T. sedoides*).

A row of exposed, small, aggregate concrete tubs on the patio serves a different purpose. These are left outside but shielded from rain in the winter. They are watered by drip irrigation and so serve as a home for those alpiners that resent frequent wet even in summer. Here difficult alpiners such as many *Androsace* species that have narrow tolerances are given a leaner soil mix, with even more grit. I put a moisture-retentive layer of soil at the bottom of the tub to act as a water reservoir. I use 2-3" of loam, being careful not to plug the drainage holes. Above this a very gritty mix keeps the roots well drained and aerated. If the

weather is unusually hot and dry, moisture will wick up to the plants from the reservoir. The upper layer is perhaps 8-10" thick and composed of 90% #2 grit (about 3 mm in diameter) and 10% loam.

I grow a range of *Androsace* species, such as *A. carnea*, *A. ciliata*, *A. cylindrica*, *A. lactea*, *A. muscoidea*, as well as several of the closely related *Douglasia* species in these tubs. Plants such as *Ourisia alpina*, *O. microphylla*, and many alpine primulas appreciate a little overhead protection. Pieces of slate pushed in at 30-40° angle to the vertical give the roots shade and coolness, prevent evaporation of water at the roots, shed rain from the crowns, and still allow sun to reach the upper parts of the plant. Rocks tend to be poor conductors of heat, so they tend to warm more slowly than surface soils and discharge heat slowly through the night, modifying the temperatures nearby.

I have a few frames that are covered in the winter. These almost substitute for an alpine house but are much less



Hale Garden with winter protection

convenient and still not as effective for growing alpiners. Here it is possible to better control the availability of water, air, temperature, and light. Alpiners in clay pots have the same mix as the tubs but are plunged in moist sand frames.

Of course anything that diverts winter rain in the garden is a help. Small frost caps (freezer bags stretched on wire frames), small lean-tos, large fiberglass frame covers, or large polyurethane tubes will work. I cover one rock garden completely with a flat, fiberglass frame and concentrate the wet-intolerant plants here.

I succumbed even further to artificial means with my moraine bed. It is a rock garden that is only watered from below. During our summer drought it is watered by a "leaky hose," a hard, 1/2"-diameter, rubber-plastic hose that sweats the water out through its sides. Leaky hose isn't as subject to blockage and is much more rugged than drip irrigation. A polyurethane tube covers the moraine in winter.

In my moraine garden I try plants that have failed in other sections of the garden but are a little large for trough or tub culture. Here are many xerophytes from Turkey perhaps, or from

our own intermountain areas. These are some of the smaller penstemons, such as *P. teucrioides*, *P. crandallii*, and *P. eriantherus*. Turkish drylanders such as *Convolvulus compactus* do well here. On the shadier side of the moraine it is possible to grow touchy calceolarias such as *Calceolaria darwinii* (*C. uniflora*) and Himalayan *Leontopodium* species, such as *L. monocephalum*.

My many garden artifices were built over many years. Your beginning will be the day a plant you love very much dies. The next time you plant it, you need to plant it in such a way as to protect it from the conditions that killed it. Perhaps you will find a new trough or just a cover. Someday, you might even find yourself building a winter covered moraine—and it surely will provide a habitat for many choice alpiners.

David Hale gardens in Portland, Oregon, and at a property on the ocean beach near Portland. David especially loves to grow difficult plants and specializes in the diagnosis of their needs. He and his wife Donna have traveled extensively in the high mountains of South America and Europe, where David is a frequent collector of seed.



THE PLANT BOX:

ROCK GARDENING ON LEVEL LAND

by Marnie Flook

Our present garden, in Chestertown, Maryland, was started when we moved in 1980 from a country property in Delaware to a Wilmington townhouse. Some plants from the original garden went to the townhouse, but others from that garden were transplanted here. When we changed our residence to Maryland in 1990 and left the townhouse, we moved as many plants as we could from the city garden to the present garden, which has continued to expand through the years. Now in addition to the areas planted with mature plants from previous gardens, there are woodland areas filled with wildflowers, rhododendrons, and other ericaceous shrubs; sunny borders planted with grasses, bulbs, perennials, shrubs, and small trees; a low slope near the water where hundreds of daffodils bloom each spring; and several plunge beds for plants in transit.

THE ROCK GARDEN

It is difficult—almost impossible, in fact—to grow most of the real alpine plants in this location, where summers are hot, humid, and sometimes very dry, but many other rock garden

plants do well. The land is flat, and there are no rocks. Building a classic rock garden did not seem to be appropriate, but growing the plants in large boxes, basically raised beds, has proved to be entirely satisfactory.

The main “rock garden” area at our present property consists of two sets of plant boxes, similar but larger than ones we had in our townhouse garden, situated by the side and the front of our house. The set in front of the house is the subject of this article. Because they are close to the house and are also visible from our second-floor bedroom window, their plants are enjoyed as much as any in the garden.

On the first of November I looked out on this garden and was struck by the many shades of green in the two boxes—a lovely tapestry, maybe not as colorful as the spring picture, but very pleasing nevertheless. Before describing the plants, I want to say more about the boxes and how they came to be.

THE ORIGINALS

The inspiration for the plant boxes, which were the main feature in the townhouse garden, came from the stone troughs we had photographed in

Scotland in the Edinburgh Botanic Garden. This extraordinary place, especially the rock garden and alpine area, is probably familiar to many NARGS members. In this section there are groups of three or four beautifully planted stone troughs of varying heights, arranged on a large terrace, each group surrounded by an appropriate ground cover.

We liked the different heights of the troughs and the way they were grouped together and decided to try for a similar effect in our townhouse garden. Stone was impractical, so instead we built four planter boxes of different heights and sizes, using 4" x 4" pressure-treated lumber. One box was close to the house where it received some shade; the other three, interconnected in a pleasing manner, were built in the center of the garden, with a background of shrubs and trees. The sides of the boxes were lined with heavy black plastic to prevent the soil from drying out. The bottom part of the boxes was filled with rough drainage material and the top 12" with a mix of 1/3 good loam, 1/3 coarse builder's sand and 1/3 peatmoss.

A few rocks were carefully placed in the boxes and on each side to give the impression of a rock ledge. The dwarf conifers and small trees were placed first, then the rest of the rock garden plants were planted. A pebble mulch was added to give a neater finish and to keep the soil cool and moist. A few larger plants were placed around the boxes. This arrangement worked out well; each year some plants grew too large and some died, but most survived. The surrounding plantings softened the outside, as did the plants which trailed over the top.

THE PRESENT BOXES

We decided to build two similar sets of boxes next to our house in

Maryland. In this article one of the two sets will be described in detail; the other set, by the end of the house, is very similar.

Both sets of boxes are made of 4"-square, pressure-treated lumber, and the insides are lined with black plastic. The same soil mixture was used; a small amount of turkey grit was mixed in the soil as each plant was planted. A few small rocks were placed in each box for added interest. Both sets consist of one higher box interconnected with a lower one. Shrubs are planted on three sides. The fourth side of each group faces the path which goes between the boxes and the house. This arrangement of boxes containing over a hundred little plants is what I call my rock garden.

The photograph shows how one of the sets of boxes was constructed and how it looked before planting. The taller part is 5' wide, 8' long, and 18" high, and the lower part is 4' wide, 12' long, and 12" high. The boxes were stained with an opaque exterior stain before planting. Partial shade is provided by a nearby large red oak (*Quercus rubra*), a dogwood (*Cornus florida*), and a small Japanese snowball (*Styrax japonicus*). Several different microclimates are provided: The front of the larger box and most of the lower one receive sun part of the day; one end of the upper box shades the plants in the box below. Shade is also provided by two dwarf trees planted in the upper box.

SURROUNDING PLANTS

The plants surrounding the boxes were chosen for their attractive, mostly evergreen foliage. A few perennials and bulbs were also planted. In front of the shady end near the house: *Rhododendron* 'Hardy Gardenia' which has large, white, double flowers and handsome foliage; *Jeffersonia dubia* and



Marnie and Bill Flook's garden, Chestertown, Maryland. Above, just completed planter boxes, with stones on wall about to be placed. Below, Marnie beginning to place plants, May, 1990. (pp. 31–39)

Photos, William Flook





Flooks' plant boxes (pp. 31–39) one year after planting, in May 1991.

Photos, William Flook

Flooks' plant boxes (pp. 31–39) two years after planting, in May 1992. Note that azalea in foreground has been replaced with *Rhododendron* 'Hardy Gardenia'.





Flooks' plant boxes (pp. 31–39), above, four years after planting, in May 1995. *Helianthemum*, *Veronica*, and *Rhododendron* 'Kazah'. Below, in late October, 1997, seven years after planting.

Photos, William Flook





Flooks' garden (pp. 31–39), view from the other boxes. Rhododendron 'Coral Bells' in foreground, periwinkle border surrounding boxes.

Photo, William Flook

Jeffersonia diphylla, whose ephemeral blue and white blooms are always appreciated, since they are close to the house; *Eranthis hyemalis*, also placed where its early yellow flowers can be appreciated; later *Narcissus* 'Hawera', a favorite, dainty, late-blooming daffodil cultivar from New Zealand, appears nearby, followed by several plants of *Astilbe chinensis* 'Finale', with feathery pink plumes.

In front of the two boxes, where it is sunnier, are several evergreen shrubs: *Calluna vulgaris* 'Sister Anne', a low-growing heather with attractive, fuzzy foliage; *Rhododendron* 'Kazan', a late-blooming Satsuki azalea formerly known as 'Rukizon'; *Buxus microphylla* 'Kingsville'; *Pieris yakushimanum*; and *Kalmia latifolia* 'Tiddly Winks'. Also planted here is *Deutzia gracilis* 'Nikko', a low-growing deciduous shrub that is beginning to spread too vigorously and may have to be moved. The yellow flowers of the fall-blooming bulb *Sternbergia lutea* give added interest at that season.

Pieris floribunda, the native pieris, is planted in the corner nearest the house where the two boxes intersect, along with another *Astilbe chinensis* 'Finale' and several plants of the dwarf *Hosta venusta*. At the far end of the lower box are a dwarf hemlock cultivar, *Tsuga canadensis* 'Stockman's Dwarf' and *Pieris japonica* 'Bisbee Dwarf'.

SHRUBS AND TREES IN THE HIGHER BOX

First to be planted in the box were two Japanese maples, a red-leaved cultivar of *Acer palmatum* and *Acer palmatum* 'Viridis Dissectum', a green, threadleaf maple. These trees have thrived and are pruned each spring to keep them in scale with the rest of the planting. It may be a little extra work, but they are so beautiful it is worth it. Another little tree in the box is *Ulmus parvifolia* 'Frosty', a dwarf Chinese elm

with tiny serrated leaves, edged with white. This tree also tends to get out of hand, unless it is kept pruned.

The three dwarf conifers planted eight years ago have grown slowly and have kept their character: *Chamaecyparis obtusa* 'Nana' and *Chamaecyparis obtusa* 'Nana Lutea', the yellow-leaved form of the dwarf Hinoki cypress, and *Juniperus chinensis* 'Echiniformis', the hedgehog juniper.

SHRUBS IN THE LOWER BOX

No deciduous trees were planted in this box; the two dwarf conifers are thriving yet still in scale: *Tsuga canadensis* 'Jervis' and *Chamaecyparis pisifera* 'Tsukumo'. Several small, ericaceous shrubs are shaded by the Japanese maple above: *Rhododendron* 'Ginny Gee' is a particularly floriferous plant; its buds are attractive from the time they form in early fall to when they open into beautiful, little pink flowers in the spring. The other two dwarf rhododendrons, *R. hanceanum* 'Nanum' and *R. keiskei* 'Yaku Fairy' are growing slowly but so far have had little bloom. Also thriving so far are *Polygala chamaebuxus*, a small shrub with pea-like yellow-and-white flowers, and *Chamaedaphne calyculata* 'Nana', a dwarf leatherleaf with small pieris-like flowers in spring. Tucked in the corner below the upper box is the tiny *Pieris japonica* 'Little Heath Variegated', a new addition this spring. All of these plants have evergreen foliage which looks good year-round. The only one I've had trouble with is the leatherleaf, which fared poorly several winters.

ROCK GARDEN PLANTS IN THE HIGHER BOX

Arabis x sturii
Armeria caespitosa
Aquilegia 'Fame Rose'
Helianthemum 'Amy Baring'
Campanula elatines ssp. *fenestrellata*

Dianthus 'Tiny Rubies'
Erigeron scopulinus
Heuchera hallii
Heuchera 'Mayfair'
Heuchera parishii
Hutchinsia alpina
Iberis candolleana
Iberis pygmaea
Phlox subulata 'Blue Hills'
Pulsatilla vulgaris
Saxifraga veitchiana
Veronica 'Waterperry'

There isn't space to discuss each plant but I want to comment on a few. *Arabis sturii* has been a good choice; its clumps of bright green leaves have spread slowly in two corners and its 4", white flower clusters are an additional benefit in the spring. *Hutchinsia alpina* has always been a favorite with its ferny, dark green foliage and flowers like a miniature candytuft. *Helianthemum* 'Amy Baring' has produced its bright yellow flowers each year but has also had a few bad years, when most of the foliage died. I like the way it cascades over the front of the box. The dwarf heucheras, which are planted under *Acer* 'Viridis', have been very successful; several clumps of *Heuchera* 'Mayfair' are now planted in the lower box in the shade of the same maple.

A warning about *Veronica* 'Waterperry', which is planted in both boxes. It has year-round interest with its evergreen foliage, which become slightly purplish in winter, and its spikes of blue flowers in the spring. However, in the boxes it spreads much too vigorously and needs to be restrained several times a year. I haven't decided to remove it yet, because many times I've needed a filler plant and have just pulled up a piece and replanted it. It always seems to live, and sometimes becomes a pest in its new location. It has another advantage of trailing its long stems

over the box, softening the edges. It is a plant visitors always ask about when they see it in bloom in the spring.

ROCK GARDEN PLANTS IN THE LOWER BOX

Aethionema grandiflora
Aquilegia saximontana
Aquilegia species
Arabis androsacea
Arabis x *sturii*
Armeria caespitosa
Aurinia saxatilis 'Tom Thumb'
Campanula elatines ssp. *fenestrellata*
Campanula garganica 'W.H. Pope'
Cyclamen cilicium
Degenia velebitica
Dianthus 'Blue Hill'
Dianthus 'La Bourbille'
Geranium 'Ballerina'
Heuchera pubescens
Iberis candolleana
Iberis pygmaea
Iberis sayana
Lithodora 'Heavenly Blue'
Orostachys aggregatus
Penstemon hirsutus 'Pygmaea'
Penstemon pinifolius
Phlox 'Coral Eye'
Rosularia pallida
Thalictrum kiusianum
Veronica 'Waterperry'

The *Arabis*, *Heuchera*, and *Veronica* have already been described. Another reliable and fine little evergreen plant is *Iberis sayana*, certainly the nicest of the three small candytufts in the boxes. I find its mat of tight green foliage as attractive as its flowers. It is interesting that this is a plant propagated by Marcel Le Piniec. *Iberis pygmaea* trails nicely over several corners in both boxes; *Iberis candolleana* is so small it probably should be in a trough. *Aurinia saxatilis* 'Tom Thumb' was planted in the lower box eight years ago. Through the years its branches have become thick and gnarled, just as promised in the Siskiyou Rare Plant Nursery catalog. It

now covers a 12"-square space on the edge of the box with more of its branches trailing below. The yellow flowers appear in spring, but it is the plant's appearance the rest of the year that appeals to me.

One of the most delicate appearing but actually quite rugged plants is *Thalictrum kiusianum*, which always seems to come up later than expected every year. After six years its underground runners have spread in and among the small ericaceous shrubs, creating a dainty ground cover of tiny leaves and little pink fluffs of flowers. Just beyond, still in partial shade, is my plant of *Lithodora diffusa* 'Heavenly Blue', one of the more temperamental plants in the garden. I am very fond of its beautiful, deep blue flowers and its narrow, dark green foliage; I've almost lost it several times during particularly cold winters. One wonderful spring it bloomed in profusion, but usually only a few flowers appear at the end of the trailing stems at any one time. It blooms from spring until fall, and even now in November, one stem still has three brilliant blue blossoms.

Orostachys aggregatus and *Rosularia pallida*, two fascinating succulent plants, are spreading in the crevice between two of the small rocks that were added to this box. *Campanula elatines* ssp. *fenestrellata*, has formed a solid green mound of attractive, serrated leaves. Not at all restrained was another campanula (probably a form of *Campanula poscharskyana*), which somehow got into the far end of the box. This spring I finally pulled out every piece, which involved re-doing that part of the little garden. The replanted *Iberis*, *Penstemon* and *Geranium* all survived—but so did a few more little plants of the errant campanula—or rather they had survived until I saw them this morning.

OTHER PLANT BOXES

It would be easy to keep writing about the individual plants in these boxes. The two sets of boxes contain a similar mix of little shrubs and plants. Another *Acer* 'Viridis' is planted in the upper box, shading several rhododendrons and a dwarf hemlock. Two more small hemlocks are planted in the box below along with *Rhododendron* 'Patty Bee' and *Pieris japonica* 'Bonsai'. In a bit more sun are *Pinus mugo* 'Valley Cushion' and *Ilex* 'Piccolo'. These boxes themselves are surrounded by a larger area planted with many ericaceous shrubs.

DISADVANTAGES

Soil tends to compact and settle in these small areas and has to be replenished; plants have to be kept under more control than in a large garden and may need to be watered more often.

THE ADVANTAGES OF PLANT BOXES

Accessibility—it's easier to get to plants; being by the house means the plants are enjoyed all the time; control of soil mix is facilitated, and many plants can be grown in a small space. In short, these boxes have proven to be an attractive and practical solution to rock gardening in a level place with poor soil and a difficult climate.

Marnie Flook says she has always been interested in growing plants but started gardening in earnest in 1952. She joined ARGS in 1962. She likes all rock garden and alpine plants but is especially fond of woodland plants, dwarf rhododendrons, and other ericaceous shrubs. She is particularly fond of traveling to remote places and exploring alpine areas.



Meconopsis grandis, amethyst form

NORTHWEST HARMONY

THE OREGON GARDEN OF THE O'BYRNES

by Louise Parsons

The cool Mediterranean climate of the Northwest offers sufficient dormant season to grow alpines, hardy plants, shrubs, and bulbs, and yet the winters are kind enough to extend the range of possibilities. Aurora, goddess of the winds, is indeed a temptress in this climate beckoning us to try many tender plants. If you come to Oregon for the Annual Meeting, you will find many varied gardens and natural spots to visit. In addition to being a lure, mild winters are also a demand on the gardener, because the weeds grow in the winter, and one never quite puts the entire garden to bed.

The setting for the lavish garden of Marietta and Ernie O'Byrne is a gently rolling series of stream features both carved and deposited by the Willamette River and its tributaries as they wandered in their course. At the edge of the valley the foothills of the coast ranges, where marine sandstones can be found, contribute to the richness and sandy texture of local soils.

Ernie and Marietta are enthusiastic composters, faithfully adding a layer every year to their borders and beds. All spent plant material is recycled into compost in huge bins. They have

added premier soil ingredients in varying proportions to make a fine setting ever better. Among the goodies are: transplanting soil from Rexius (a local forest products company); pumice purchased or collected in the Cascades; 1/4"-1/10" gravel (which must be washed!) from one of the rock crushing companies; cinders; and garden compost purchased in addition to the bountiful home-made supply.

As you travel from Eugene to the garden, you pass gradually out of the Willamette Valley floor into a region of foothills and gently rolling, mature outwash terraces. South of Fern Ridge Reservoir, turn onto Central Road and pass by typical, small farms with their charming agricultural variety. You have been told to look for a bamboo hedge and find that from the road, the residence and garden look much like the small farms and rural homes of their neighbors. But hidden from the road is another world. As you pass through a beautifully crafted ironwork gate with stylized clematis and a fanciful dragonfly fashioned from a bolt, you are likely to at least silently gasp with pure surprise. Here, in contrast to the open rolling fields and scrub oak,



Asperula sintenisii

is laid before you a lush array of unexpectedly grand proportion. Yet despite the surprise, you simultaneously and instantly have the feeling that it all somehow belongs here.

Most certainly the birds and small animals think so. As crammed with exotica as it is, this is a garden for and about nature. The raspy call of a Bewicks wren is heard and a sapsucker hammers diligently on a mossy oak. A northern oriole darts secretively through the heights of a mature poplar. Three-season resident hummingbirds gently buzz among their favorite flowers, which are found in abundance. Through the summer they have a large selection of salvias and other favorites from colorful perennial beds. Among the kniphofias on the menu is the Ugandan *K. snowdenii* for some exotic nectar dining indeed!

The visitor's greeting committee may consist of one of the quietly friendly greyhounds, who are taking a break from their endless deer-patrol marathons while Ernie and Marietta are busy in the spacious propagation areas of their garden and nursery, which specializes in alpiners and fine woodland plants. A ginger cat gives a

friendly rub and goes back to a favorite sleeping spot to settle in. In front of the residence an immaculate lawn under a large maple is swept with a huge border of woodlanders and shade plants. The bamboo frontage serves as a windbreak and protects woodland gems from the hottest afternoon sun. A long drainage way rimmed with poplars is home to a stunning display of primulas and other spring moisture-loving plants. Beyond the drainageway is another light woodland area with deep rich soil that is home to meconopsis, arisaemas, ferns, and countless other treasures. A large open area beyond the house is the sunny setting for rock gardens and troughs. North of the house a shady area features many *Helleborus orientalis* hybrids in fabulously rich colors (photo, p. 45). Conifers and mats create a pleasing interplay of form, texture, and ever-changing color in open areas(photo, p. 48). A sense of harmony is created, and your eyes dance from one beautiful spot of green to the next in the intricacies of ferns, shrubs, ground covers, and woodlanders.

This expansive garden has an incredibly creative layout. You are car-

ried from one area to another without being conscious that you are led. To best appreciate the totality of this or any garden of grander scale, a complete walkabout is advised first. Easier said than done, as so many plants enchant and beg you to stop and take a close look. You find a path that takes you through the center of a generously wide border and have all intentions of following it through a portal of weeping Atlas Cedar to realms beyond, but are stopped short by a magnificent *Arisaema taiwanensis* with its stem of brown and green in intricate bargello or 'flame-stitch' patterns. Vistas and visual corridors are so subtle that you never feel hedged or hemmed-in—no garden-rooms in this garden, but rather, garden *spaces*. The floor-plan style is open.

There is a heightened sense of chiaroscuro as you stand in a shaded area and look through a wide window bounded loosely by trees and shrubs towards the sunny scree garden beyond. This is the essence of the relaxed and natural, yet devotedly cultivated style of the Northwest garden. Nature is tamed, shaped, and tended to artistic ends, but she is always respected. It is tempting to use the word "rich tapestry" to describe this garden, but a tapestry does not begin to convey the sense of depth and texture. Nor does it express the harmony and rhythm found here. Always there is animation—in the subtle sometimes sparkling dance of the sunlight filtered through lacy trees and shrubs—in the glow of pale or bright foliage against deeper forest greens.

It is the plants themselves that are the best judge of the worth of a garden. When those that are recalcitrant in nature go beyond mere survival to thriving, setting seed, or otherwise spreading, this is the best tribute of all. *Glaucidium palmatum* and *Corydalis*

flexuosa grow as though they truly belong among the gentle sea of treasures. The naturally cool soil in the Northwest favors many woodland plants such as primula, meconopsis, and corydalis. With the excellent soil that Ernie and Marietta have built, Himalayan plants do especially well, because all their needs are met. Even in the height of summer the nights are cool enough to keep soil temperatures down. In the lightly shaded beds, *Meconopsis horridula*, *M. betonicifolia*, and the especially profuse bloomer *M. x sheldonii* all show clear, glowing shades of blue. *Meconopsis grandis* 'Amethyst Form' adds an unusual gemstone color to the palette. Marietta and Ernie enthusiastically raise the great majority of their thousands of plants from seed. This year for the first time *M. punicea* has germinated and produced six good-sized plants. Another challenging plant to grow, *Primula bhutanica* has produced about 40 plants. With careful heed to micro-environment, these made it through the summer heat and reward the O'Byrnes with their soft blue bloom and gently blended white eyes. This charmingly modest primula lacks stomata for cooling and is particularly intolerant of any blasts of heat or sun. This primula is also a rare find, because the seeds are especially ephemeral. Many natives of Japan such as *Helionopsis orientalis* with its puffy globes of tiny, starry, pink 'lilies' do well in the cool, lightly shaded woodland.

In an open area where it can be enjoyed from the patio, a large rock and scree garden (photo, p. 48) has been constructed with boulders and generous slabs of meta-andesite from nearby Conser Quarry. As they learned the ways of the winter rain that accelerates the decomposition of organic material, the O'Byrnes found

most plants suited to a soil richer than conventional alpine mixes. Enriching the soil somewhat also helped the plants of high places to survive the summer drought better. On a lovely day in July I enjoyed a lunch of tasty salad, made from select greens from Ernie and Marietta's beautiful vegetable garden, on the deck with a splendid view of the rock gardens. Hummingbirds buzz among the wall of *Lonicera heckrottii* that borders a pool. *Silene hookerii* and *S. x ingramii* show off their clear pink bloom nearby. Campanulas and *Origanum* 'Kent Beauty' are found among the conifers and countless saxifrages, and carpets of raoulias and mosses have spread to generous proportions. Troughs hold countless gems such as a *Lewisia* hybrid from Eugene grower Jon Splane that blooms over a long time with a shower of soft, peachy yellow. *Lewisia longipetala* x *cotyledon* has produced profuse blooms of soft apricot and yellow shades, while *L. rupicola* x *leana* sports a bright cerise. Both lewisias are also found in the open garden. *Anemone obtusiloba* is another trough resident with a long bloom. *Ranunculus parnassifolius* x *amplexicaulis* is a tirelessly blooming gem whose seed came from Henry and Margaret Taylor. Large cushions of porophyllum saxifragas are to be found both in troughs and in the open garden. *Gentiana verna* makes a very floriferous pool of the bluest blue in the open garden year after year.

The crevice garden, built by Josef Halda in a single night on a quick visit, consists of slabs of platy andesite placed on end in a generally sandwich form to provide planting spaces. In addition to the usual rock chockstones added into the soil, the mix is rich with screened pumice. Some choice crevice ferns such as *Cheilanthes tomentosa*, an especially silvery form, have

spread along the crevices. An Oregon native fern, *Cheilanthes siliquosa*, prides itself on its spot atop a generous crevice. An intricate ball of *Selaginella sanguinolenta* var. *compressa* is prosperous enough to have produced some small offspring. On the shady sides of the slightly protruding, vertical rock plates, rich rosettes of ramondas are nestled along the seams. At the top of a crevice, a delicate Northwest alpine kittentail, *Synthyris pinnatifida* var. *lanuginosa*, displays lovely, pale, ferny foliage.

Under the shade of a trim elm tree you will find a new damp-peat garden, featuring Ericaceae and other acid-loving plants. Rocks are used discretely in this elevated bed. In the relentless Northwest winter rain, it is necessary to provide for drainage, even in a garden designed to please plants of the aerated bogs and seeps. For this reason, the bed contains a generous amount of screened pumice and rich peat. Deadfall branches and small logs add structure to the bed. The weathered limbs are intertwined slightly and create a natural appearance. Early color is provided by rhododendrons such as *R. yunnanense* and a cultivar 'Lavendula', and a growing collection of the choicest primulas. In brighter light at the edge, *Salix yezoalpina* rambles naturally with its upright catkins and furry pleats of newly emerging leaves in the spring.

There is ample opportunity to enjoy some especially diminutive gems along the front expanse of this garden. *Carex conica* var. *marginata* creates a tiny foliar fountain of white, crisply pencilled edges. Gently rotating, weepy mounds of *Cassiope lycopodioides* show tiny glimpses of their bright, beet-red stems. *Kalmiopsis fragrans* 'Le Piniec Form' has settled into its new home, along with a choice new *Helichrysum* from the Sani Pass, South



O'Byrne Garden, Eugene, Oregon, in May (pp. 41–49), *Helleborus orientalis* hybrids. Ernie and Marietta have, with their seed-grown plants, expanded the local range of flower colors of these Oregon-loving plants to include rich reds and slaty blues.

Photos, Ernie O'Byrne





Troughs and containers in the O'Byrne garden. Below, with saxifages in bloom.

Photos, Ernie O'Byrne





Conifers in assorted sizes, shapes, and textures lend an architectural element to the garden and provide year-round interest at the O'Byrne garden (pp. 44–49).





Rock and scree garden at the O'Byrnes', Eugene, Oregon (pp. 44-49). Above in June, below in July.
Photo, Ernie O'Byrne

Photo, Louise Parsons



Africa, that shows off felted silvery foliage at the front of the bed in good light. In the early autumn, *Erica tetralix* 'Alba Mollis' displays pale candles of new growth and terminal clusters of plump but tiny, white eggs among its rich, deep green foliage. *Codonopsis aurantiaca* from a recent NARGS Seed Exchange is settling in, along with *Corydalis bracteata*, a native of Siberia and the Altai.

Ernie and Marietta have a varied collection of *Corydalis*, which have been situated around the gardens according to their special needs. *Corydalis solida* glows rosy pink in its rocky spot, and *C. integra* 'Papanicolai' has a special home in a trough. Both of these *Corydalis* species have an excellent flower presentation and appear often on the show bench. *Corydalis* 'Munich Sunrise' could surely find a place there and thrives here in its trough home.

An Oregon gem growing in a rocky but sheltered spot is *Trillium rivale*, with its diminutive but generous cluster of cupped, white trefoils with prominent yellow anthers among shiny, petioled leaves.

"Running out of room for larger plants and still being immoderate in our collecting desires" is what got Marietta and Ernie interested in rock gardening. More than a decade ago they joined NARGS. They have played a key role in starting and sustaining the Emerald Chapter. Ernie recalls that one of the first articles that he read in the *Bulletin of the ARGS*, by Phil Pearson and Steve Doonan, was about a trip to Ice Lake. It captivated and held his interest, even though the plants mentioned were all unfamiliar.

Like all devoted gardeners, Ernie and Marietta have goals, plans and projects underway. One area that they have had less success with is the plants of the dryland West. Because all

of their established garden is watered during the summer drought, they are planning a separate area for dryland plants in an out-of-the-way spot at the end of a hoop house. Here they will have unwatered sand beds and raised bulb beds.

Winter wet is already moderated in places by the use of plexiglass covers, but there is a limit to that. Some plants such as *Convolvulus boissieri* have been tried and found to "just melt away," even under cover, in the humid and cold winter. None of this stops the rock garden from continually bursting with color though. When their drainage needs are met, many Mediterranean and Turkish plants such as *Asperula sintenisii* smother themselves in flowers among the rocks. With diminutive stature and furry, sage-green foliage, this is a rewarding rock garden plant.

What can the future still hold for a garden so close to the pinnacle? Ernie and Marietta claim that there are still weeds to eradicate, although no one else has seen any here. Recently the O'Byrnes have begun to experiment with Turface[®], a baked clay product that may be used as a soil-conditioner, to both increase air ratio in the soil mix and retain a desirable moisture level at the same time. There are still new plants to be desired. The propagation area is bursting with immaculate pots of seedlings. Newly sown seeds, carefully top-dressed with grit, hold the promise of yet more treasures to come.

Louise Parsons' garden in Corvallis, Oregon, consists mostly of shady rockeries with ferns and woodland plants. She plans to construct a scree garden soon. Rockhounding, hiking, birding, and gardening have all been beloved hobbies since childhood. Photos by Ernie O'Byrne.



WESTERN CASCADES:

GEOLOGY FOR ROCK GARDENERS

by Louise Parsons

If you plan to visit Oregon's Western Cascades, be prepared to look at more than the plants at your feet. Step back a bit and take in the scenery. Enjoy the beautiful sky and cloud formations, as the constant flow of marine air from the Pacific rises to meet the challenge of the mountain peaks.

On a mountain visit, learn all you can about the landscape around you and under your feet. Bring binoculars to observe the birds, wildlife, and scenery. When you inevitably turn your attention back to the plants at your feet, even greater satisfaction and enjoyment are available. Having seen the plants' natural setting in its totality, we can gain not only knowledge of the plants but also of their native rocks, landforms, soil, drainage, wildlife companions, climate, and geography. Bring a hand lens to examine details such as rocks, lichens, and mosses. Lichens are an important indicator of microclimate and vegetation stage and provide nest material for many of nature's high meadow and rock garden visitors, such as hummingbirds. Oregon is a lichen Mecca, and the lichens play a key role in the

initial breakdown of minerals into products important to the growth of higher plants. The recent publication of the lavishly illustrated field guide to Northwest macrolichens is especially welcome (McCune and Geiser, 1997).

CLIMATE AND MICROCLIMATE

Whether a plant grows in a pot in the alpine house or on a vast natural hillside, the influence of nature is inescapable. The Aleutian low pressure system, moving in from the Pacific Ocean with its push of relatively warm, moisture-laden air, is a dominant feature in the climate of the Northwest. The Western Cascades Mountains trend north-south, and their frontal position allows for an abundance of precipitation to fall as the clouds of the front move up in altitude.

One can hardly discuss climate this year without making reference to El Niño, but recent studies (1997) recognize a more significant climatic cycle called the Pacific Decadal Oscillation, or PDO. There is some uncertainty among atmospheric scientists as to the extent of El Niño's influence. The "positive" phase of the PDO causes relatively warm, dry winters and low

winter snow packs and alternates with a wetter, warmer "negative" phase.

The complexity of microclimates is a distinctive characteristic of the Western Cascades. The natural drop in temperature caused by increasing elevation, without regard to other factors, is called the temperature gradient. On the west side of the Cascades, the altitudinal gradient's effect is moderated by moist, relatively warm, westerly winds for a good portion of the year. Additionally, the rugged topography results in local patterns of cold air drainage, and in some locations this moderates temperatures and contributes to a greater number of frost-free days in some locations. At high

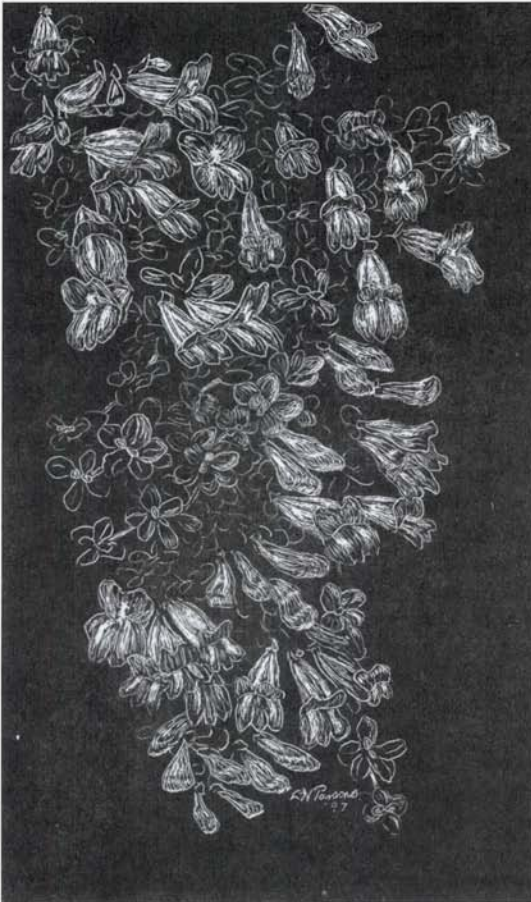
altitudes there is nonetheless an alpine imprint to the climate.

Certain diurnal changes in soil temperature are characteristic of the alpine environment, where the atmosphere at high altitude is thin. The earth radiates heat out into the atmosphere at a more rapid rate than at lower elevations where the atmosphere is thick, so that heat is lost ongoingly. Even though there is a high receipt of solar energy, the soil temperature does not rise as rapidly as would be expected at low elevations, because of outgoing terrestrial radiation. In addition, the soil at night yields the heat gained during the day back rapidly to the night sky. The diurnal cycle of the temperature of soil can be as critical a factor in plant growth as the type of soil or rainfall.

Soil temperatures are modified under the rocks of alpine soils, also. Touch the ground under a small rock and notice that the soil feels cool even on the hottest day. Only the outer surface of the rocks warms up. This effect is especially pronounced in the volcanic rocks, largely composed of glass, common at high elevations in the Cascades.

ROCKS AND PLANTS

The Western Cascades are composed of older, eroded volcanics that have undergone uplift and differential erosion since they were formed in the volcanic events of the Eocene and Oligocene, 50 to 30 million years ago. The original peaks and surfaces are eroded away, leaving their jagged remains as exhumed sentinels to their fiery past. These older volcanic rocks have been subjected to subsequent metamorphism in con-



Penstemon rupicola

junction with the uplift of the Western Cascades and the formation of the High Cascades to the east. This metamorphism affects the soil-building properties of the rocks. When metamorphism recrystallizes minerals, it can sometimes lock them up chemically so that they become unavailable to plants. An extreme example of this is found in serpentine rocks, but milder examples of the same effect are found in the Western Cascades. At other times metamorphism contributes to the breakdown of rock into soil. The high rainfall erodes volcanics of varying competencies leads to landslides and carves dramatic landforms and rock sculpture.

The dikes, necks, plugs, cores, and batholiths, artifacts of ancient volcanoes, are composed of dense rocks with interesting crystal structure, jointing patterns, and cooling history. The texture and mineral composition of volcanic rocks govern to a large degree their ultimate fate and form. We often hear about porous volcanic rocks and how they aid in the transfer of water. These are formed when the lava cools

with many gases forming bubbles, cooling into the empty spaces called vesicles, which when abundant may connect to form channels through the rock. Typical Western Cascades volcanics, however, are not porous, because they often represent deeper portions of the volcano, where gasses are absent. The bubbly scoria and pumice are only occasionally found. As those of us who have used pumice to make rock planters have discovered, porosity and permeability are two very different characteristics.

Feather rock and pumice planters must be watered carefully, because they do not act as sponges, even though they look like them. This is because the vesicles in these rocks, although numerous, are not well interconnected. Feather rock, also from a younger age than the Western Cascades, is a form of hydrated obsidian. It is formed as steam-blown glass, from lava under water. The occurrence of feather rock is restricted, and thus it is expensive. Pumice is famous as the "rock that floats," because air is trapped in its vesicles. The silica-rich



Trillium ovatum

glass of which it is composed makes pumice easier to tote than its heavier iron and magnesium-rich sister scoria, but the latter alters over geologic time to a richer soil.

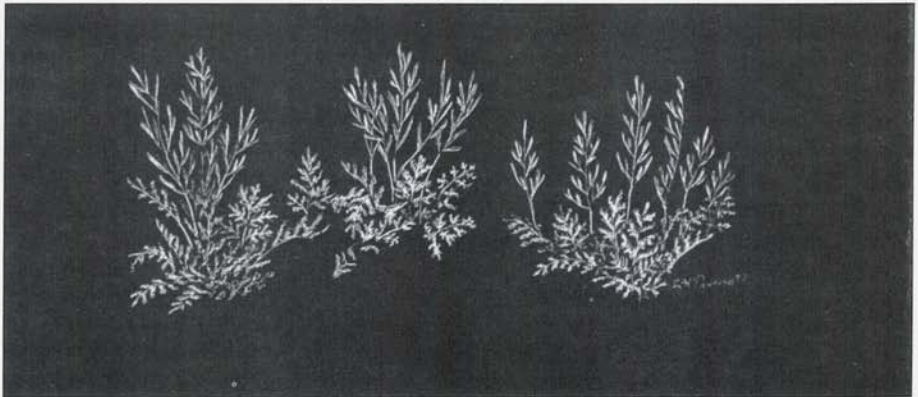
The pumice found in Eugene area gardens is from the geologically younger High Cascades. Vesicles on the outer surface act as tiny cups, hold some water, and likewise serve to trap air. This is why these rock materials, when unconsolidated or present in detritus, ash, or scree, make for an excellent rock garden soil. The roughened texture is favored by many saxatile plants. Corvallis rock gardener Loren Russell once remarked that when he uses red scoria cinders for planting material he notices an abundance of roots clinging hard to the cinders when unpotting them. The scorias contain less silicates than pumice and are mineralogically more diverse. We have taken the cue and used scorias in the Alton Baker Park Rock Garden in Eugene.

In the scale of soil-building time, volcanic glass and minerals of intermediate composition, major components of the Western Cascades, alter relatively quickly to clay in high rainfall. Such rocks are rich in a type of calcium-rich feldspar that effectively delivers important bloom-promoting

elements such as potassium and phosphorus to the soil. The gardener may generally be disdainful of clay, but its presence, at least in micro-amounts, may be critical to the existence of even the most rock-loving plants. The mineralogical structure of clay, with its ability to hold and release cations, delivers nutrients otherwise unavailable to plants.

When plant roots penetrate seams and cracks in rock, they hasten the alteration of that rock by introducing more water, which in turn acts as a weak acid. The process literally feeds on itself, and the breakdown of the rocks accelerates.

While Western Cascades volcanics do not have the dramatic bedding planes associated with sedimentary rocks, when building a rock garden with them one can nonetheless find a pleasing rock geometry to show off plants. Cascades andesites and basaltic andesites frequently have a chemical composition and cooling history that favors the formation of the mineral hornblende, with its characteristic elongate crystal form. The presence of hornblende influences the microfabric of the rocks, which in turn controls rock cleavage. Andesites rich in hornblende often have a platy rock cleavage, which makes them a wonderful



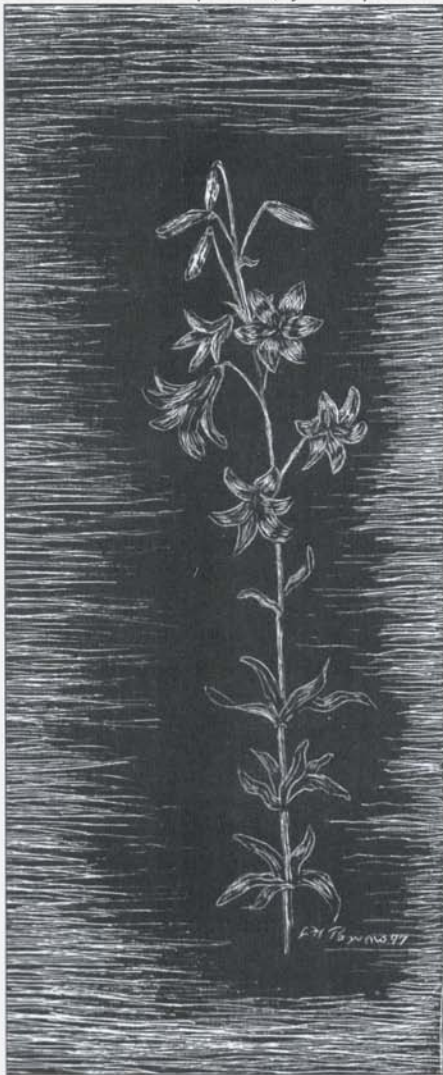
Cryptogramma acrostichoides

material for crevice gardens.

This hornblende-rich rock is used to great effect in the crevice garden of Eugene NARGS members Ernie and Marietta O'Byrne. Platy andesites produce a detritus known as rock shingle, and it always amazes me to see plants in the wild, such as *Lilium washingtonianum*, push their way through it. The energy used must be phenomenal! This wonderful lily was once widespread, but it is sadly too often plundered. Taking about seven years to bloom from seed, this lily is definitely a rock plant, despite its stately height.

Joints in columnar basalts, which form under specialized cooling conditions, give it a "Giant's Causeway" appearance. When de-roofed by erosion or exposed by road cuts or quarrying, such rock becomes sought-after material for the rock garden. Loren Russell has taken advantage of the natural geometry of these basaltic rock blocks in the construction of his pond and recent rockwork. Less regular in pattern, but producing a dramatic effect in nature, are the cooling joints associated with the core lavas exposed by extensive erosion in the Western Cascades. As remnants of volcanos, both Iron Mountain and Cone Peak have many beautiful examples of natural crevice gardens with planting seams and pockets created by rock fracture. These volcanic bones are part of the beauty of the scenery. In the Iron Mountain area, you will find *Penstemon rupicola* scrambling over the jagged basaltic andesites that were once deep in the heart of a massive volcano. With more breakdown into soil, a mixture of small blocks, rock detritus, and fines creates a lean soil favored by plants such as *Castilleja hispida*. One could not ask for a more versatile rock garden soil than the detritus created by the breakdown of andesitic volcanics.

Joints and rock cleavage planes create conduits for water and percolating water can carry soil into the joints. In some places, where soil has accumulated as a result of rock expression, you can find decorative ribbons with distinctive plants, such as *Sedum oregonense*. Ferns, especially the lip ferns, rank high as natural crevice treasures in the Western Cascades. Feathery *Cheilanthes siliquosa* (syn *Aspidotis*



Lilium washingtonianum

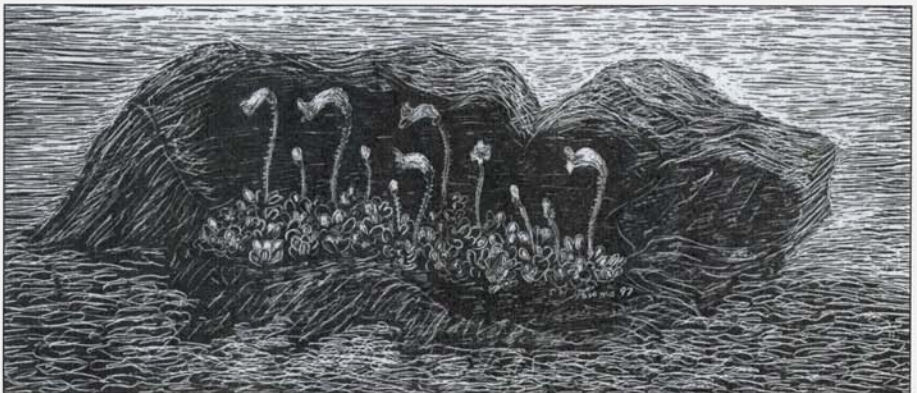
densa) is found in areas with the strong light that it favors. Although sometimes reported in the literature as having an affinity for serpentine (Mickel, 1994) it is found in areas of intermediate volcanics such as joints in old dikes and plugs in the Hemlock Butte area. The similar-looking parsley fern, *Cryptogramma acrostichoides*, may be a near companion, but generally prefers a bit more shade and shelter. In northern and eastern exposures one can find *Cheilanthes gracillima*, or lace fern, which has a special affinity for cool seams in dense, finely crystalline, volcanic rocks. Its affinity for high and dry places is well-known. Fern forayeur Robin Halley (1996) has described the adaptive mechanisms of this group of ferns in detail and notes that they possess a wax on their fronds and hairs to discourage excess evapotranspiration by air movement. They also send long, wiry roots deep into tight crevices. An especially attractive spikemoss for the trough or crevice garden is *Selaginella wallacei*. Its tiny branches drape gracefully over rock. Dense, fine-grained rocks found in the bones of old volcanos remain cool even on the hottest day of the summer, providing a perfect home for many rock ferns.

On a larger scale, discontinuities

such as faults, contact zones between ancient flows, or paleosurfaces create seeps and springs. Along these we find the characteristic linear sweeps of stunning plants such as deep ultramarine blue-violet *Delphinium menziesii*. In some instances, the lubricating action of water and the presence of a slip surface can create an "active" or creeping scree, or even a rockslide. The action of freezing and thawing yields a crumbly, aerated soil known as "popcorn soil." Oxygenation and natural cultivation from this action favors seed germination, and popcorn areas may be home to tiny ephemerals, since this wonderful soil also dries out quickly.

Bedding differences, slip surfaces, and heavy rainfall sometimes create a geologic hazard or nuisance in the Western Cascades. Road and trail repairs as a result of slump or road foundation failure are continually necessary in some areas. In forested areas you may notice "drunken trees" with curved trunks or swayback posture, a sure sign of an area of active creep or slide. Fortunately, in the areas of field trips for the 1998 Annual Meeting the geologic hazards are designated merely non-catastrophic or nuisance.

I have mentioned but a few of many factors which influence and enhance



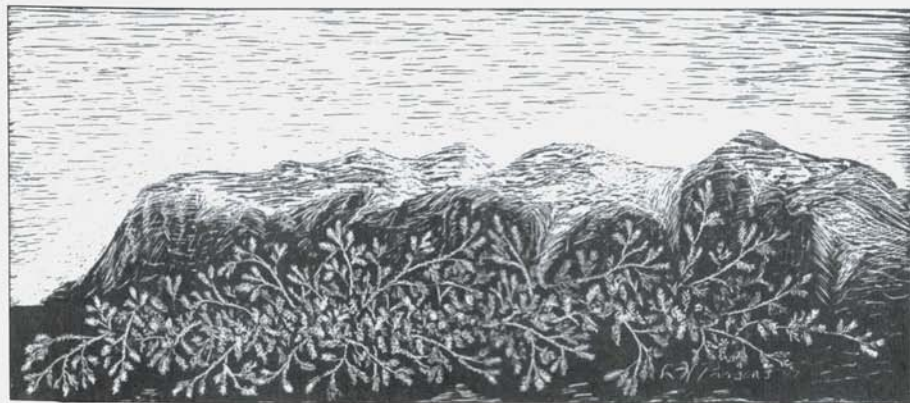
Orobanche uni with *Sedum oregonum*

the variety of plants and habitats that can be seen on the 1998 Annual Meeting field trips. At the edge of the forest, we will enjoy open hillsides with *Rhododendron macrophyllum* and *Lilium columbianum*, whose bloom is often promoted by air drainage. A close look at a cool patch of sedum may reveal solitary white, ice-blue, or purple, elongate bonnets of *Orobanche uniflora*, a parasite companion. This tiny broomrape is widespread in its distribution, but it is elusive, adorable, and always a treat to find. It once saved me from a bad-hair day. I had dropped my camera. As it landed on a rock shelf, I had to climb down a rock cliff to retrieve it, even though I had sensibly retired from rock and glacier-climbing a number of years earlier. Feeling in quite a funk, somehow the sight of those *Orobanche*, reminding me of a group of ostriches at the opera with comical hats on, put things into perspective. My camera suffered only minor damage. There are so many beautiful trails, lakes, bogs, natural gardens, and vistas in the Western Cascades that is hard to select just a few for the Annual Meeting field trips. If you plan to visit, try to allow some extra time to explore. Here are a few details of two outstanding areas that we will visit.

BOHEMIA MOUNTAIN

Bohemia and Fairview Mountains are in a geologically puzzling portion of the Western Cascades. The rocks of the Calapooya Mountains have a distinct bulk chemistry and a unique tectonic history. The geology of this mining district, with its complexity of faults, breccias, intrusions of unusual rocks and mineralization has been described in detail by economic geologist J.J. Gray (1978). The name "Bohemia" is often a curiosity to visitors. James Johnson, the prospector who discovered the Bohemia mines in 1863, was known as "Bohemia Johnson," supposedly because Bohemia was his place of birth (McArthur, 1992). In some areas, percolating hot water has bleached and softened the rock, creating a desirable rock type for many of the plants found along the road up Fairview Peak.

Incidentally, if you visit the Alton Baker Park rock garden in Eugene, you can find zeolites and other colorful minerals in the meta-basalt that is used in the construction of this garden. These lovely, jagged, milky white veins of minerals were created by a less intense form of hydrothermal metamorphism associated with intrusions. Metamorphism has given the basalt in the Alton Baker Park rock



Selaginella wallacei

garden an attractive, blue-green color. In the Bohemia-Fairview Area, the extensive faulting and rock fracture associated with intrusions has created conduits for springs that are home to moisture-loving plants. Between Bohemia Mountain and Fairview Peak glacial cirques that have been subsequently eroded not only provide beautiful scenery but also enhance our accessibility.

HEMLOCK BUTTE

As you travel from Eugene along Highway 58 to the town of Oakridge and Hemlock Butte, a Western Cascades hiking destination, you transect a section of geologic time and events. A few road cuts show evidence of the uplift these older volcanic mountains have undergone and the physical and geochemical overprints of change. The typical structure of ash flows, tuffs and lavas associated with volcanism is obscured by metamorphism and alteration associated with the uplift. Preserved ancient mudflows, similar to the recent one that took lives in the eruption of Mt. St. Helens, still show the characteristic unsorted jumble of rock clasts in a mud matrix, despite having been pressure-cooked in the process with the uplift and later intrusions. Both mudflows and ash-fall or air-fall tuffs break down quickly to soil types that have abundant sticky clay. In areas of more massive volcanics, such as the flanks and cores of the ancient volcanoes, the soil is stonier and coarser-textured. In some cases, you do not need a soil survey to recognize the two main classes of Western Cascades soils—one sticks madly to your boots in wet weather, the other does not!

Forest roads around the Oakridge area climb Hemlock Butte and other mountains to reveal beautiful scenery with lovely views of Diamond Peak, a

snowy shield volcano of the High Cascades. Interrupted drainage has created wet meadow and bog areas where *Dodecatheon jeffreyi* bloom in a shower of shooting stars for the Fourth of July. At least two species of hummingbirds, the Rufous and Black-Chinned, may be seen frequently darting among both visitors and the numerous species of wild currants found in this area. One of the most hummingbird-alluring of these is the fuchsia-flowered currant, *Ribes lobbii*, which provides an attractive little twinkle to the fireworks display. Some of the hummingbirds' other food choices include *Arctostaphylos columbiana*, *Gaultheria humifusa*, *Amelanchier alnifolia*, and almost any of the Rosaceae. Along the rocky hillsides, fiery orange skyrockets of *Ipomopsis aggregata* also lure hummingbirds. One of the tiniest hummingbirds, easily mistaken for a moth, the Calliope, is also occasionally seen. The species lists, both birds and plants, for the field trip areas are long and reflect a variety of habitats, from cool, duffy forests to springs and bogs to rich meadows to spectacular rocks and volcanic scree. When you come to enjoy the vast array of flowers, don't forget your hand lens and your binoculars!

Drawings by the author.

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THE ONE-FOOT RULE

MUSINGS FROM A ROCK GARDEN

by Alexej Borkovec

The metric system has many advantages, but it lacks the beauty and simplicity of the word "foot." As a rock gardener, you simply can't say: "I don't grow anything taller than 30.48 centimeters." But saying: "taller than a foot" sounds just right. However, once you've said it, you're in for a fight. True enough, "foot" being a four-letter word, most rock gardeners and writers on rock garden plants won't make such a statement in mixed company, but little by little the "one-foot rule" has crept into their consciousness. Why did that happen?

One reason, which can be easily refuted, is that all alpiners, i.e., plants that grow in the mountains above the tree line, are small, usually much smaller than a foot. Of course, "usually" is correct, but the number of exceptions is quite large, and, more important, not all rock garden plants are true alpiners. Many grow well below tree-line, and some even on the seashore.

A better, but also much more complex, reason involves rock garden aesthetics. A rock garden is an artificially created landscape containing plants. It attempts to fulfill certain aesthetic requirements. These requirements are

not entirely arbitrary and subjective; they have their origin in natural landscapes, especially those in the high mountains or other alpine regions. Anyone who has ever visited these lofty places must have recognized immediately the source of all rock garden characteristics: the screes, ledges, crevices, and the distinct architecture of plants that grow there. However, as Reginald Farrer wisely, if somewhat purplishly, noted in *The English Rock-Garden* (T. C. & E. C. Jack, London, 1919), "nature in the mountains is often chaotic, bald, dreary, and hideous in the highest degree." A rock garden should then be a highly selective imitation of natural landscapes in which the plants are in full harmony with their surroundings.

Everyone who has ever constructed a rock garden knows that the entire process from start to finish is an exercise in making compromises. Some may be physical, some financial; most are of both kinds. Probably the most often encountered compromises are related to the size of the garden and of the stones used for its construction. With some notable exceptions, the outcome is apt to be some 100–200 sq.

meters (1,000–2,000 sq. feet) of space constructed from stones averaging 20 kilograms (44 pounds) in weight. Such a rock garden can be constructed, planted, and cared for by one or two persons. My guess is that most private rock gardens in America, and even more in Europe, fall into this category.

The harmony between the size of the plants and size of the rock garden is one of its most important aesthetic features, and to put it in very simple and practical terms, large plants are much more difficult to place than small ones. This is perhaps one good justification for the one-foot rule. A plant that “sticks out” from its surroundings is either poorly placed or doesn’t belong in the rock garden at all. It should be understood, however, that “sticking out,” like all other aesthetic features, is a subjective value judgment that defies exact definition. In fact, it is sometimes desirable that a plant “stick out” to provide contrast or accent. Planting dwarf conifers is a good example of such deliberate rule-breaking.

Although an expert rock gardener can accommodate almost any plant in his landscape, a foot-tall plant in a small rock garden often presents a difficult problem. In alpine regions, nature has an unrelenting solution: a poorly placed plant is either killed or at least drastically dwarfed by the elements. However, relatively mild climactic conditions in lowland gardens do not provide such automatic corrections, and therefore, plants of low stature are considered the best choice for creating a harmonious landscape. In addition, many small plants, including almost all the true alpines, have some very special features that are frequently referred to as “architecture.” Of course, all plants possess architecture of some kind, but the rock gardener almost instinctively recognizes the

special architectural elements that distinguish a rock garden plant from just any other small plant. Tightness of growth, congested shape, twisted branches, large flowers relative to the size of leaves and of the entire plant; these and other similar features are characteristic of most alpines, but they are seldom found in large lowland plants. Quite a number of small lowlanders, however, do exhibit such features to varying degrees and thus gain entrance to the rock garden and to the rock gardener’s heart.

An even more pragmatic justification for the one-foot rule is the scarcity of available space. Sooner or later, every rock gardener begins to complain of not having enough of it. This is true regardless of how many times the rock garden has been enlarged; space is always at a premium, and large plants take up too much of it. Whereas cutting back a low-growing plant, if it starts taking too much space, can usually be done without depriving it of its beauty, trimming a larger plant may be a losing proposition. Some bushes, coniferous or broadleaf, tend to be more forgiving, and may even look better when properly pruned, but most herbaceous plants look their best only when they are given free reign in their growth and development.

It appears then, that the “one-foot rule,” if not taken too seriously, has some merit as a useful guide for additions of new plants to the rock garden. Fortunately, most rock gardening books, including the recent *Encyclopaedia of Alpines* (K. Beckett, ed., AGS Publications, Ltd., Pershore, UK, 1993), take the same stance.

Now, what about other rules of good rock gardening? Again, we should go back to Farrer, because he was one of the few writers on the subject who didn’t shy away from stating

rules in rather absolute terms. Of his many "musts" and "must-nots," two that are most often broken concern rock garden construction and seed sowing.

Farrer insists that a rock garden "must not be near trees or big bushes of any sort." However valid this rule may be, most rock gardeners break it because they either are reluctant to cut down a large tree that provides needed shade, or they choose to have larger trees or bushes as a background for their rock garden. Nevertheless, breaking this particular rule is costly in the long run. Within five years, or even sooner, a single large tree or bush, less than 10 meters distant from a newly constructed rock garden, will hungrily send its roots into this virgin territory and produce a dense network of feeder roots that will keep extracting water and nourishment for years to come. Because a large tree can transpire two or more thousand liters of water every day during the growing season, its piracy is not to be taken lightly.

Farrer was apparently aware of the irresistible temptation and aesthetic appeal of trees or bushes as ornamental background to rock gardens, and he half-heartedly offered the following solution. Dig a deep trench between the tree and the rock garden, cut off all roots extending in that direction, and sink a wall of upright flagstones into the trench. He admitted though, that this entire operation would have to be repeated at about five-year intervals. Because my own rock garden sits in the middle of a forest, I had to come up with a less laborious solution. Whenever I re-do a bed or even plant a single plant, I make a hole at least 30 centimeters deep and cut all the tree roots in the process. It helps, but not too much, I must admit.

Farrer's second most often broken rule was: never sow seeds, especially

the small ones, too close together. Although this rule appears in one form or another in every book and article on growing plants from seed, it is probably broken as frequently as it was in Farrer's time. Wise advice, indeed, but surprisingly few follow it. You receive an envelope with perhaps several hundred dust-like seeds of a gentian or a saxifrage and ponder the rule looking at a row of your pots ready for sowing. The choice is clear: all in one pot or one-tenth of the seeds in each of the ten pots. Whatever you choose, however, the outcome is apt to be one pot with hundreds of tiny seedlings or ten pots with nothing. Why is it that when for the first time you decide to follow the rule, the seeds won't germinate? Maybe they were inviable to start with, but could there be some magic involved in the seeds' togetherness? I am inclined to believe in the non-magical explanation, and one of these days I'll conduct a good, scientifically controlled experiment.

In general, these and many other rules of rock gardening are valuable and useful, they should be promulgated, studied, and memorized, but they should not be followed blindly. A wise rock gardener will break as many rules as he will keep.

Alexej Borkovec grows about 1,000 rock garden plants on 200 square meters in the very un-alpine climate of Silver Spring, Maryland.

BOOK REVIEWS

Trilliums, Frederick W. Case, Jr. and Roberta B. Case, 1997. Timber Press: Portland, OR. ISBN 0-88192-374-5. 285 pp., 78 color photos, 43 maps, 3 figures including 163 detail drawings, 6" x 9", hardcover. *Trilliums in Woodland and Garden, American Treasures*. 1997. Don Jacobs and Rob Jacobs. Eco-Gardens: Decatur, GA. ISBN 0-9658353-0-8. 152pp.

To begin, let me say that anyone who has an interest in trilliums will want to own both of these books. While they cover what is essentially a small genus of plants, they are as different as night is from day, and after years of having essentially no trillium books in existence in the English language, two are certainly not too many.

Fred and Roberta Cases' book *Trilliums* is an expert, professional, well-organized, and beautiful publication. Fred Case is widely acknowledged as being the 'trillium guru' by most people. He has spent a large part of his life growing, studying, and writing about these plants, as well as about terrestrial orchids and a few other genera, all ably abetted by his equally talented wife 'Boots,' who has done work in many botanical areas, notably with bog plants.

Timber Press has done its usual expert job in formatting and in the reproduction of excellent photographs. The book has a glossary, index (perhaps not as complete as one could wish), bibliography, and a novel (at least to me) key, with line drawings to illustrate the usually confusing botanic terminology. Fred states early on that this work is not intended to be a taxonomic treatment, and he follows along with what others have previously done in this regard, particularly in the sessile trilliums, where the classic work of the late John Freeman is still considered by most to be definitive. There is much information about trillium hybridization, both in nature and in cultivation, the latter being a particular interest of the Cases.

One minor criticism that I could make is that the bibliography might have included mention of Don Jacobs and Edith Dusek, who have both written extensively about trilliums. Dusek is certainly a recognized expert on trilliums of the Pacific Northwest and was involved in the discovery and description of the last species to be officially recognized, *Trillium parviflorum*.

While the Cases' book is a classic text in the usual sense, the Jacobs' *Trilliums in Woodland and Garden, American Treasures* is an informal, chatty, highly informative work, co-authored by Don and his son Rob, and, incidentally, dedicated to John Freeman, who died this past spring. Don's book is self-published and unfortunately lacks the polish that a professional publisher such as Timber Press can apply. Don made the mistake of doing his own proofreading, and the book is burdened by a plethora of typos and misspellings, which are a bit distracting at first. It also lacks an index, glossary, or bibliography.

Having said that, I found the book to be quite remarkable, a true gem. It is a friendly, readable publication, chock full of all kinds of practical information.

The material on propagation is very complete, including up-to-date information on the status of tissue culture for trilliums. The authors include short essays such as "The World of Trilliums and People," a brief plea for us to appreciate and preserve the planet on which we live; "Whence Came Trilliums," in which they trace the evolution of the species and possible migration of plants across Berginia in the early history of plants on earth; and essays on associations with other plants, especially *Magnolia* species; and *Trillium* species migration and hybridization. Their tips on a few of their gardening practices are truly pearls.

The Jacobs book, like the Case book, has a large section devoted to descriptions of all the species, again with excellent, well-reproduced photographs. There is also a key to the species, which seems quite complete, but without illustrations. The Jacobs also generally follows the standard trillium taxonomy, although they go into more detail with the *Trillium pusillum* complex, including a separate key. They treat *T. hibbersonii*, a rare dwarf species of the Pacific Northwest, as a distinct species, while Fred agrees with those who consider it to be a dwarf form of *T. ovatum*.

Both books also mention a form of *Trillium ovatum* with mottled leaves (there is a photo in the Case book), of which I first learned only this year, and which has not previously been described in print. It is the only pedicellate trillium with leaf mottling and is obviously quite rare. The Cases opted to incorporate the formal scientific description of the plant as a *forma nova* into their book, conferring the official name *T. ovatum forma maculosum* F. & R. Case. While such descriptions are required by the rules of international botanical nomenclature to include the type collection, it is perhaps unfortunate that the exact location is thus provided to a public not known for its self-restraint.

Each book is priced at \$30. I did not count the number of color photos in either volume, but both are generous in this regard. Both books are available through the NARGS Bookstore at discounted prices. The Case book may also be ordered directly from Timber Press, 133 SW Second Ave. Suite 450, Portland, OR, 97204, Tel.: 1-800-327-5680. The Jacobs book can be ordered directly from Don Jacobs, PO Box 1227, Decatur, GA 30031, Tel.: 1-404-294-6468.

—Jim McClements

Northwest Penstemons, by Dee Strickler. The Flower Press: Columbia Falls, MT. 1997. Price: \$29.95, plus postage.

It is not very often that a genus gets a book dedicated to it alone, even a book covering part of its total range. There is one now, for *Penstemon*, which covers 30% of the total number of species of this large genus. Dee Strickler, a retired university professor living in Montana, who has written several books on western wildflowers, has now published a well-researched volume on penstemons of the Pacific Northwest.

The introduction is excellent, being informative and well written. All 80 species in the four states he covers (Oregon, Washington, Idaho, and Montana) are included in an introductory key. Each species then appears in a two-page spread, with an excellent color photo filling one page. The other page contains a written description, some drawings of the plant, and a map of its distribution. At the end of the book is a glossary of terms.

This book is a must for anyone working with northwestern penstemons, either in the wild or in the garden. The beauty of the photographs may win new friends for the genus, also. Note that acquiring some of these photographs cannot have been easy—some have narrow geographic ranges, growing on particular mountain tops or deep in distinct wilderness areas.

This is a hardback book and is available from Dee Strickler, The Flower Press, 192 Larch Lane, Columbia Falls, MT 59912. Strickler's *Wildflowers of the Pacific Northwest* is available from most bookstores. Three other, smaller volumes by this author deal with Montana wildflowers. Strickler is a member of the North American Rock Garden Society.

—Kenneth and Robin Lodewick

Dwarf and Unusual Conifers Coming of Age, A guide to Mature Garden Conifers, by Sandra McLean Cutler. Barton-Bradley Publishing Co.: North Olmsted, OH. 176 pp., 360 color photographs, 34 keyed line drawings, softbound, ISBN 0-9654717-0-5. Price \$40.00, plus \$6.75 shipping & handling. NARGS Bookstore: \$32, plus shipping.

Sandra Cutler is an enthusiastic gardener in North Olmsted, Ohio. After visiting the conifer collection at the US National Arboretum in Washington, D.C., she developed a keen interest in conifers for the small garden. She could not find adequate information for the neophyte conifer enthusiast. She wanted basic information on how to select, design with, and maintain conifers in the garden.

Rock gardeners have always incorporated conifers into the garden, generally as companions to herbaceous alpine perennials and to provide winter interest. This book offers information about conifers in addition to mature dwarf and miniature conifers that would be used in the rock garden; included are many quite useful to the rock gardener.

Chapter 3 is a brief history of the Gotelli and Watnong Conifer collections and about the collectors. The story is told of how Mr. William Gotelli came to be such an avid conifer collector and his relationship with the US National Arboretum that prompted him to donate his large collection. Photographs document his exotic conifer collection at his New York home, and also the details of the transfer, construction, and installation of the collection at the US National Arboretum in Washington, D.C.

Basic information about conifers, which the author has gleaned from numerous sources, is the body of Chapter 4. There are definitions of sizes and forms and basic nomenclature. The author has generously credited and acknowledged her sources and recommended conifer collections to visit. A brief sketch of the American Conifer Society is presented here, as well information about Friends of the National Arboretum (FONA) and Longwood Gardens in Pennsylvania.

Chapter 5 is a descriptive alphabetic listing of more than 350 conifers, genera, species, and cultivars. Numerous color photographs focus on specific features of the plants. Many photos illustrate the plants in landscape settings. Each plant name is followed with a brief description, which includes estimated growth rates and sizes, forms and habit, color, texture and other pertinent information. The USDA Hardiness Zone designations are appended to the text, along with

specific cultural information.

Care and maintenance comprise the final chapter. It begins with a discussion about variables one should consider when purchasing and planting conifers. Categories like hardiness zones, soils, planting techniques, and cultural practices are discussed in a general manner, adequate for the novice gardener. A discussion of common pests and diseases and how to treat them fills several pages. The information is of a general nature and related to the Integrated Pest Management Practices employed at the US National Arboretum. Following the final chapter is an extensive bibliography and recommended reading list, along with a detailed glossary and index.

Throughout the book the author has used numerous shaded sidebars to provide specific information related to the adjoining text. Ms. Cutler has been generous with credits and accolades for those individuals who have helped her assemble the information for this book. The book is well written for the beginning conifer enthusiast. It is a useful text for any gardener interested in conifers. I appreciate the special sections recognizing specific institutions and individuals that promote the use of conifers. This is a "user-friendly" book. It is a good guide to the conifer collections at the US National Arboretum. As well as a useful tool to take to the garden center when selecting plants for your own garden. In short, the book has a wealth of information for the home gardener.

—Don Howse

A Garden of One's Own, writings of Elizabeth Lawrence, edited by Barbara Scott and Bobby J. Ward. 1997. University of North Carolina Press: Raleigh, NC.

Fans of Elizabeth Lawrence will be delighted to learn that yet another book of her writings has been published in 1997, posthumously. Co-editors Barbara Scott and Bobby J. Ward, members of the Piedmont Chapter of NARGS, spent considerable time scouring old national and local North Carolina publications for unpublished gems of Elizabeth's writings. Previously, we have been able to savor her manuscripts and newspaper columns in books like *A Southern Garden*, *A Garden in Winter*, *Through the Garden Gate*, *A Rock Garden in the South*, and *Gardening for Love*. *A Garden of One's Own* brings together pieces Elizabeth wrote for *House and Garden*, *Flower Grower*, *Horticulture*, *Pacific Horticulture* and a host of other publications, including the *ARGS Bulletin*, in the years between 1936–1981.

Alpine plants and rock gardening were always dear to Elizabeth's heart. She was one of the founding members of the American Rock Garden Society in 1934, and her love for rock gardening shines through her writings throughout the years. Like Linc Foster, Geoffrey Charlesworth, and Katherine White, she was both a hands-on gardener and a deliciously opinionated writer who loved to experiment and push the boundaries of what was accepted gardening practice at the time. Although she gardened only in Raleigh and Charlotte, North Carolina, during her lifetime, her information about bulbs or trees, perennials or alpiners is valid and interesting to most gardeners, because she kept up an extensive correspondence with other keen gardeners from around the country, and tidbits of their experiences are sprinkled throughout her writings. And unlike most of us

results as we get busier and busier, Elizabeth always kept detailed records of each plant—invaluable references, whether she wrote about crinum, trilliums, or hellebores. (Editors Scott and Ward have updated the nomenclature as needed.)

This newest Lawrence book is a good read, perfect to pick up and enjoy on a wintry evening by the fire. Her charming, personal and informative writings probably will lead you to read more of Elizabeth Lawrence, if her books are not already treasures on your garden bookshelves. Savor them all.

—Sandra Ladendorf

Southern Alpines '96. 1997. Southern Alpines Ltd., P.O. Box 2984, Christchurch, NZ. ISBA: 0-473-04651-2. 183p.

Anyone contemplating a visit to New Zealand or Australia or interested in the alpine plants of the Southern Hemisphere should be sure to read *Southern Alpines '96*, a complete record of the proceedings of an international conference hosted by the New Zealand Alpine Garden Society and held in Christchurch in January 1996. The book covers everything relating to alpine plants in the southern hemisphere: origin of the land and first plants, geology, geography, climate, plant species, hybrids and cultivars, which plants will succeed in gardens, environmental problems, plant reproductive strategies, pathogens and controls.

New Zealand is naturally given most attention in the book. Each talk is reported; included are Hugh D. Wilson, on the environment and ecology of South Island; *Celmisia*, by Lawrie Metcalf and David Given; *Raoulia*, by Josephine Ward; Alpine *Ranunculus* species, by Steve Newall; B.P.J. Malloy on New Zealand's alpine orchids; Hebes, described by Philip Garnock-Jones; Joe Cartman on plants for gardens; Roger Good on Australia; plants of Tasmania, by Ken Gillanders; the Republic of South Africa, by David J. McDonald; South American alpine plants, by John Watson; Marnie Flook of North America on plants Chilean Patagonia, Argentina; the reproductive biology of New Zealand alpine plants, by C. J. Webb. Conservation was on the minds of most speakers. Walter C. Clark gave an amusing and thought-provoking talk dealing with man's harm to our environment. David R. Given, in an abstract on conservation prospects for alpine and subantarctic floras in the Southern Hemisphere.

Obviously a great deal of thought and work has gone into the preparation of the 183 pages of this book. Editor John S. Sheppard and his assistants did a superb job. The organization couldn't be better—the index leads the reader directly to the subject, which is then given careful and thoughtful treatment. An appendix of references published since 1970 appears at the end of the book. The format follows generally that used in the publication of the *Century of Alpines* from the 1991 international rock garden plant conference in Warwick, England. Good quality glossy paper and clear, easily read type were used. The 68 color photographs are all first rate, and the photographers should be congratulated for a job well done. The binding appears to be sturdy. I can only wish for someone, somehow to come up with a good binding which permits a book to lie flat. In order to make notes, one must secure the book with one hand and write with the other. Certainly a minor criticism for so fine an accomplishment.

A friend remarked, not altogether facetiously, "Well, if you can't go there, read the book. It's cheaper!"

—Dot Plyler

PRESERVES

Rock Grasses in the Bükk, Hungary

To begin let me tell about Bükk National Park. In 1942, 24 hectares of "old beech" forest came under protection in Szilvasvarad and 12 hectares of pine woods in Javorkut. In 1951 Stephen Cave and Petofi Cave and in 1955 Szalajka Valley—558 hectares—were added. The National Nature Protection Office in the winter of 1975 started the Institute of Bükk National Park and on 28 December 1976 Bükk National Park was created. Today its total area is 38,775 hectares.

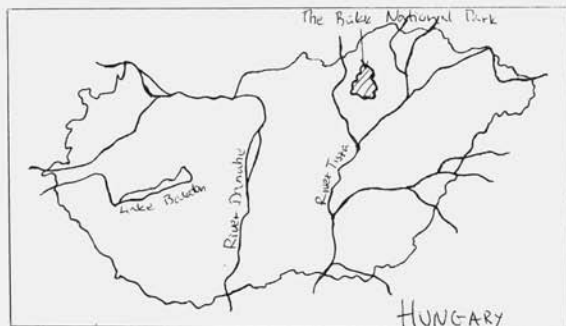
Rock grasses form a thin layer of ground cover associated with pioneer species in the Park. In the Bükk Mountains there are three plant associations of rock grasses: one on limestone; another on dolomite; and a third association on silicates. The plant community is determined by the rock substrate. The erosion of the Bükk Plateau and the rocky areas of the lower foothills favors the development of these plant communities. Typically various rock grass species dominate these associations. The genus *Sesleria* is very important. *Sesleria heufleriana* is found on the rocks of Szarvasko and *S. hungarica* on limestone. *Festuca cinerea* ssp. *pallens*, too, is a very important species.

In the *Dianthus-Sesleria* association in the Bükk, only on the Bel-ko, lives a Carpathians-Pannon native species, *Dianthus plumarius* ssp. *praecox*; *Hieracium bupleroides* ssp. *tatrae* is an element of the alpine flora. *Thalictrum foetidum* with its yellow flowers and *Cytisus ciliatus* are scarce yet characteristic plants here in the limestone rock grass community. On the south side of Bel-ko is the only place *Calamintha thymifolia* is found in Hungary. Between stones in the more protected and warmer declivities 84 individuals have been counted.

The characteristic plants of the rock grasses in the Bükk are: *Grimaldia fragrans*, *Bryum argenteum*, *Asplenium septentrionale*, *Cystopteris fragilis*, *Polypodium vulgare*, *Saxifraga paniculata*, *S. ascendens*, *Sempervivum hirtum*, *S. marmoreum*, *Sedum acre*, *S. hispanicum*, *S. album*, *Festuca pseudodalmatica*, *Sesleria heufleriana*, *Calamagrostis varia*, *Daphne cneorum*, *Asplenium ruta-muraria*.

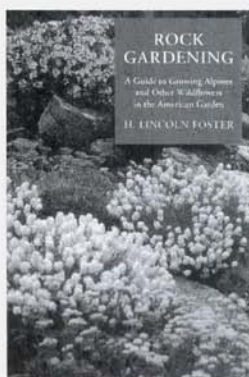
On the stones of Szarvasko in the *Minuartia-Festuca pseudodalmatica* association lives a plant which is really rare in Hungary, *Woodsia ilvensis*. *Minuartia frutescens* itself is strictly protected.

I wish to thank Mr. Morris West and Mr. Norman Singer, who have helped me to become a member of this Society. —Laszlo Varga



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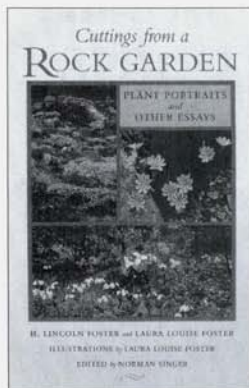
H. LINCOLN FOSTER and his wife, LAURA LOUISE "TIMMY" FOSTER, were an inseparable horticultural team during their long and productive lives. Linc served two terms as president of The American Rock Garden Society, and Timmy acted as editor for the society's bulletin for a number of years. They jointly received both the prestigious Arthur Hoyt Scott Garden and Horticultural Award in 1978 and the Silver medal of the Massachusetts Horticultural Society.



Rock Gardening

This book, called "the bible for American rock gardeners," covers all aspects of designing, creating, planting, and maintaining a rock garden for both beginners and experts. It includes detailed instructions for using rocks in the landscape as well as many landscape planting ideas. The heart of the book is a descriptive catalog of more than 1,900 individual plants in 400 genera, with cultivation information for each, illustrated by Timmy's lovely line drawings.

0-917304-29-2, 466 pp, 70 line drawings and diagrams, 5½ x 8½", paperback © 1968
Regular price \$24.95, NARGS price \$20.00



Cuttings from a Rock Garden

Edited by Norman Singer

Now available for the first time in paperback, *Cuttings from a Rock Garden* gathers together essays and articles the Fosters published over a 30 year period, providing the next level of information for rock gardeners. It features Linc's closely observed plant portraits, in which he describes how to grow more than 100 genera. Timmy also tells the story of how in 1949 the Fosters came to Millstream House and turned a woodland mountainside in Connecticut into one of the most enchanting rock gardens in the world.

0-88192-377-X, 446 pp, 14 color photos, 43 line drawings, 6 x 9", paperback © 1990
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