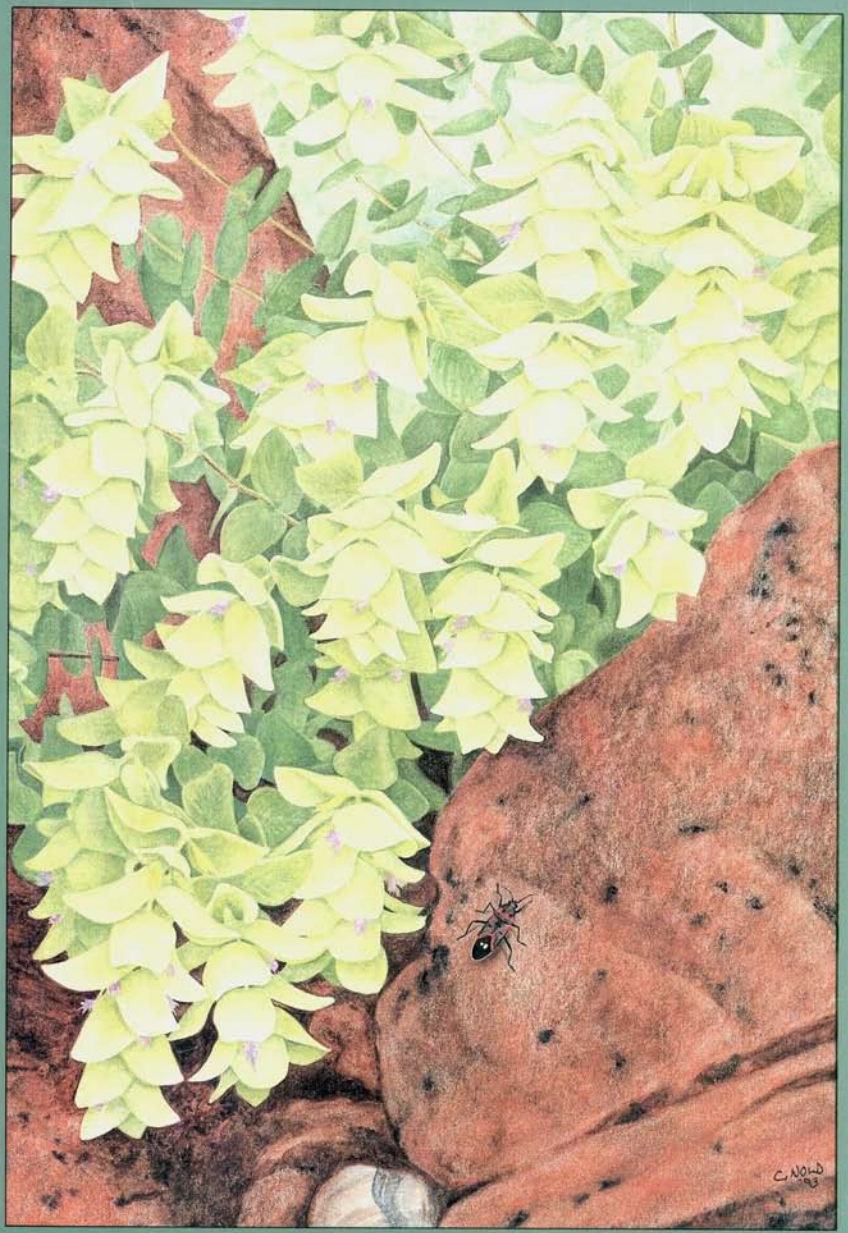
Bulletin of the

American Rock Garden Society



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Cover: *Origanum acutidens* with *Lyggeus kalmii*

by Cindy Nelson-Nold of Lakewood, Colorado

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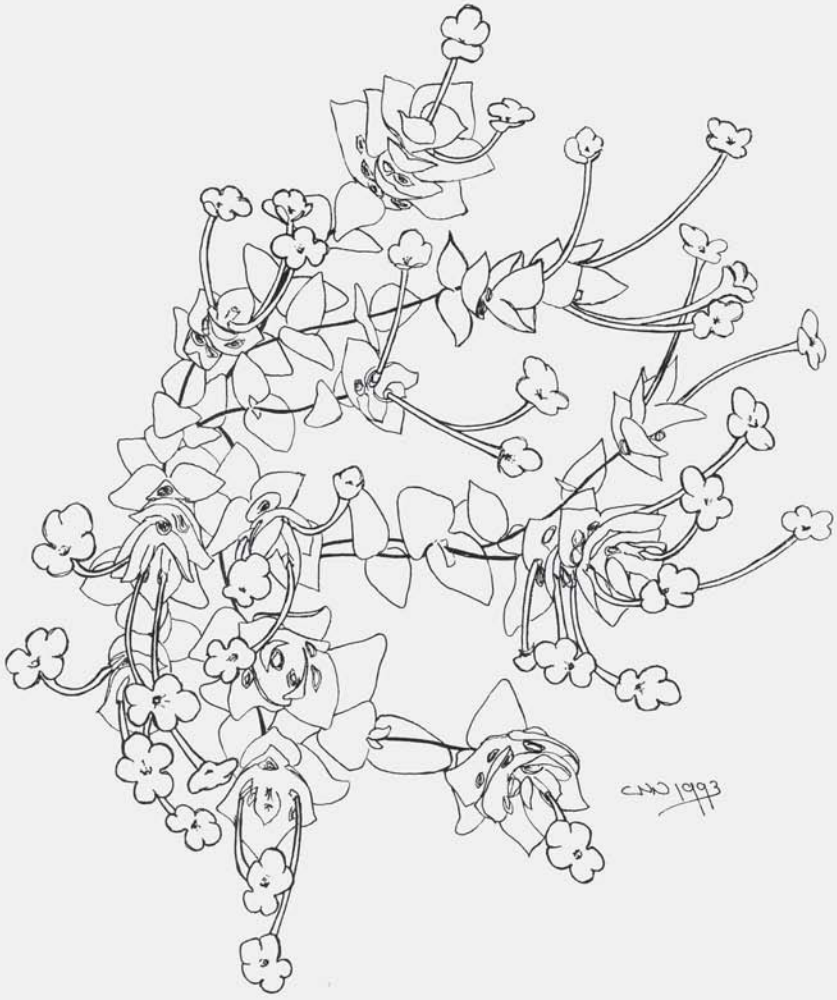


Origanum amanum

Origanums:

Seasoning for the Summer Doldrums

by Panayoti Kelaidis

We've all heard about the mischief the "Gang of Four" caused in China during the Cultural Revolution, driving out diversity and quashing competition. I am sad to relate that rock gardening has been victimized by the "Gang of Five": *Androsace, Draba, Dianthus, Primula,* and *Saxifraga.* These five great genera of alpine plants encompass so many worthy species—so often sold and written about—that many rock gardens consist of little more than these, to the exclusion of many other worthy alpines.

The greatest drawback to these five great genera is their extremely short season of spring bloom. They produce a dazzling display of vivid color from the end of March, most years, to the end of May, but few indeed are the species in these genera you will find blooming in the heat of summer. Now I don't suggest that you tear your collections of these out of your gardens—at least, not right away. But consider how much longer color would last in your garden if it contained more *Allium, Campanula, Cyclamen, Eriogonum, Gentiana, Helichrysum,* and *Penstemon.* And if you want to rivet the attention of garden visitors in the months of July and August, grow the genus *Origanum.*

The charm of ornamental origanums is elusive. They are wreathed in luminous chartreuse and mauve—two of the subtler garden hues. With one or two notable exceptions, their flowers are virtually invisible. The color display is concentrated in leafy bracts that envelope the flowers. Their allure depends heavily on their sculpturesque form—all have fluid, arching branches that cascade gracefully over rocks. This probably sounds somewhat recondite, and perhaps frou-frou. I simply plead that you obtain some, plant them in a choice crevice or above a steep rock, and let them festoon and garland your garden. One season of their subtle magic, and you, too, will find that your garden is not complete without them.

Familiarity Breeds...

But there may be a hurdle lying athwart your path. Perhaps you have already met the poor cousins and think the family unworthy of further acquaintance. You know the most often encountered origanums, the culi-

nary oreganos and marjoram (*Origanum marjorana* and *Origanum vulgare*), the Greek oregano (*Origanum heracleioticum* or *O. vulgare* v. *viride*). These mainstays of herb gardens, pizza parlors, and, yes, of my mother's kitchen, have so often bluffed their way into the rock gardens and then proved themselves undignified. Once through the garden gate, they proceed to spread by seed or rhizome with a zest and alacrity more appropriate to a roller derby. By all means plant these in your herb garden; they don't seem to spread half so fast in rich loam as they do in starved scree. They are delightful, but do keep them in their place. Greek oregano is distinguished from Italian oregano primarily by its flower color, the former being white and the latter purple. They are equally invasive. There are several variations on the golden-leaved marjoram (*Origanum vulgare* v. *aureum*) that I have found to be somewhat more dwarf and a trifle slower at the root than the typical form of the species. The golden color is strongest in spring and autumn and on hot, hungry exposures. In my experience, self-sown seedlings of golden marjoram revert to greener, weedier plants. If you have a small rock garden, you will be much happier with the species described below.

I have grown nine species of outstandingly ornamental origanums over the last decade. Each possesses a distinctive beauty and allure that guarantees it a place in my gardens. Eight fall rather neatly into four pairs of fraternal, if not identical, twin species remarkably similar in overall garden utility. The ninth species, *Origanum microphyllum*, is an oddity with tiny leaves less than a quarter-inch long. It is usually grown in pots where its miniature charms can be observed closely. It is native to the White Mountains of the western end of the island of Crete, where it grows from 500 to 1800 meters in elevation. It should therefore possess a good measure of cold hardiness.

Ermine Spice

Surely, the best known of ornamental oreganos is dittany of Crete—a classic plant of herb gardens and an aristocratic pot specimen that has been grown in British gardens from as early as 1561. This is the ultimate foliage plant of the genus. The neatly clasped, oval, opposite leaves are downy with a coat of finest white ermine hairs. This is a plant that seems to glow no matter what the light. Like *Origanum microphyllum*, dittany of Crete occurs only on limestone cliffs of its namesake island. It is apparently quite common throughout Crete over an altitudinal range from 300-1900 m. This would lead me to believe that there must be considerable tolerance of winter cold in many populations of the plant.

Of course, dittany of Crete is perfectly hardy in Mediterranean climates such as California and can be grown in rock garden conditions as far north as Seattle, at least. It would thrive in Arizona or Texas. The rest of us, however, must be content to plant it out in the spring and harvest cuttings in the fall—or grow it in cold frames or alpine houses. With the many flower lovers who visit Crete, perhaps a high altitude form of this species that will adapt more widely to cold-temperate gardens might be brought into cultivation. The sooner, the better.

Or perhaps we are being timid? Soon after the Rock Alpine Garden was completed, I visited Ed and Jean Carman's wonderful rare plant nursery in Los Gatos, California. There among the other treasures I saw my first *Origanum tournefortii* (now generally accepted to be *Origanum calcaratum*, photo, p. 64), a slightly grayer-greener

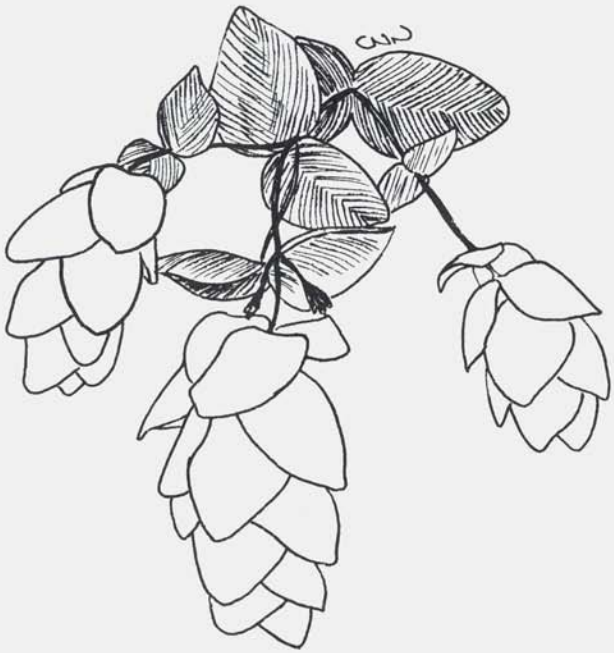
cousin to dittany, and with rounder leaves. Not knowing that this is a plant from even lower elevations on Crete and a few other small Aegean islands, and that it is considered, if anything, much more tender than dittany, I planted out my proud new nursery purchases on a few sunny, well-drained slopes in the Rock Alpine Garden in Zone 5 Denver. Two relatively mild winters ensued, and this sumptuous origanum grew cheerfully ignorant that it was violating the sacred Zone laws of the USDA. It paid dearly for this crime in the third winter.

Fortunately, the Carmans continue to grow this plant, and I have reimported it and planted rooted cuttings hither and yon, as have many other rock gardeners in Denver. It continues to prosper during the more benign winters Denver offers up, but I would not recommend it for large groundcover schemes quite yet. *Origanum calcaratum* is something of a Dr. Jeckyll and Mr. Hyde plant. Once trimmed back to the new growth in the spring, it produces a compact mound of woolly foliage of considerable charm and miniature beauty that would entrance the most exacting rock gardener. The mound does, however, continue to expand and expand, and by summer's end you will find your *Origanum calcaratum* an extravagant mound of beauty as much as two feet tall, or even a yard across. The flowering bracts are suffused with pink and purple tints, and the tiny, tubular flowers peeking out here and there are quite charming in a subtle way. This is a plant for larger gardens, nonetheless—particularly those in zones 7-10.

Bric-`a-Bract

The theme of subtly colored bracts is expressed much more compactly in the next set of twin species from the mountains of Anatolia. *Origanum rotundifolium* (photo, p. 62) has only been grown in rock gardens and alpine houses for a few decades. It is restricted to just a few gorges in northeastern Turkey and nearby Armenia. The large, oval, chartreuse-colored bracts practically obscure the tiny pinky-green flowers that they protect. The bracts indeed are the primary ornamental feature of this plant. They are in evidence from June through the remainder of summer, forming a dome-like plant 6-8" tall and a foot or more across. Almost everyone who sees them for the first time is reminded of the flowers of hops vine. This impression is quickly dispelled if you bother to pinch a leaf, for it has a pungent, spicy aroma that could effectively deodorize a brewery. Jim and Jenny Archibald recently introduced a very similar species: *Origanum acutidens* (photo, p. 64) is somewhat more widespread in southeastern Anatolia. According to the *Flora of Turkey* treatment, *O. acutidens* can grow almost twice as tall as the more northerly *O. rotundifolium.* Plants that I have grown of both species are much the same size. The bracts on *O. acutidens* are more circular than oblong, and the flowers are, perhaps, a little more in evidence, and slightly pinker. This has much the same utility and overall effect as *O. rotundifolium,* and only the most fanatic of oreganophiles would demand to grow them both.

Assuming that all Mediterranean plants demanded the hottest, driest spot in Colorado, I had been somewhat annoyed at how my hop-flowered oreganos tended to have short lives and were less robust than I'd hoped in the Rock Alpine Garden. I was to learn from Jim Archibald that not all Mediterranean habitats are the same: most of these ornamental oreganos don't grow in the hot, sunny open fields at all, but in woodlands,



Origanum scabrum hybrid 'Emma Stowley'

usually on cool cliffs, in declivities where moisture accumulates and where their roots never dry out or even heat up much, even in the summertime. No wonder they proved so tender in garden loam! I began to plant them on cool, north-facing slopes of the rock garden along with lewisias and rosularias. Sure enough, the origanums grow twice as fast, live much longer, and self-sow with abandon in these microclimates that so closely approximate their native cliffs.

Precious as Myrrh

Two larger species of oregano have earned a special place in my affections. I have grown *Origanum laevigatum* and *Origanum libanoticum* in the Rock Alpine Garden since early in that garden's history. They have gracefully settled into every spot I have ever put them, painting some of the most dramatic garden pictures I have ever created. These robust perennials are not for the faint of heart: they can grow 30" tall, and they spread mildly at the root to cover an area a yard across. In winter both die down to a trim mat of evergreen shoots. Some years I let the tops of these plants persist through the winter, and their colorful bracts are attractive right through spring. This is not essential, however, since if the plants are cut back the basal foliage is alive and colorful through the winter and perfectly hardy here.

What is so appealing about these tiny-flowered perennials? Of course, they have vividly colored bracts stained deep mauve and opalescent gray in *libanoticum* (photo, p. 63), while in *laevigatum* (photo, p. 64) the stems, leaves, and bracts are often tinted a deep purple. Several famous cultivars are particularly brilliant. I have only grown 'Herrenhausen' one season so far, but 'Hopley's Purple' has proven its mettle for three years now in Denver.

These may be rather large for purist rock gardeners, but they are rock plants nonetheless. Plant them on the flat, and their effect will be flat as well.

Their willowy, winding stems demand to be grown above rocks, in crevices where they can be seen draped to advantage, splayed out over the rock.

Descriptions of mere flower and foliage color do not begin to capture the allure of these plants—you really must see and grow them to appreciate their sculptural presence in the garden. The stems do not form the typical breadbox-like mound so many perennials are expected to produce. They are emphatic. They are demonstrative, pointing and dangling, moving and swaying with the slightest breeze. They have all the grace of a leaping fountain or a *corps de ballet*. These are graceful, lilting maidens of the summer garden. They remind us that gardens are not paintings, not monuments, but glimmering moments as sweet and fleeting as a child's kiss or a stranger's smile.

Choicest

There remain two origanums compact enough and rare enough in their beauty to satisfy the most elitist of rock gardeners. *Origanum scabrum* is restricted to a handful of mountains in central Greece and the Peloponnese where it is found above 1000 meters in elevation. As with most oreganos, this is a plant of limestone crevices and cool screes. It generally grows less than 6" tall, spreading by short rhizomes to make plants a foot or so across in time. The bracts of *O. scabrum* are stained a particularly brilliant deep rose and purple, painting as bright a spot of color as any mere flower (photo, p. 62). Although I have grown this wonderful plant for almost ten years, I have found that it is harder to strike from cuttings and more temperamental to divide than any other origanum I've tried. That does not prevent me from saying I would rate this as one of the very best plants I have ever grown. Let us seek out more forms of these, and get it about. It is one of the chief glories of the summer garden.

When Peter Davis first introduced *Origanum amanum* (photo, p. 64) to British gardens in the 1950s, it was cosseted as a fragile alpine house plant and regarded as a delicate southerly waif that would never overcome its homesickness for its mountainous Near Eastern home. Gradually, gardeners built up stocks and more and more people risked spare plants out on screes and in troughs. I obtained my first plants as cuttings from Kew in 1981, and I remember how surprised I was when they emerged fresh and unfazed by their first Colorado winter. Within a few years they had formed clumps a foot across producing hundreds if not thousands of bloom stalks throughout the summer season. Slowly I began to suspect that this was to be the centerpiece of the summer rock garden. When my wife, usually exclusive indeed in which plants she grants garden space, insisted on planting *ten* individual specimens in her tiny rock garden, I knew it was a gem indeed.

Origanum amanum rarely grows more than 6" tall in peak bloom, spreading by rhizomes to a foot or more across where it is happy. This is a rock plant in nature, so a sloping bed (the steeper, the better) is the place to grow it; between crevices is even better. Over the years I have planted it in limestone scree and granite grit, even in rather stiff loam. It cares less about the soil than having good drainage and a relatively cool aspect, despite coming from mountains near the Syrian desert. This plant rarely grows below 1500 m in elevation and may reach as high as 2300 m elevation on the Duldul Da near Adana in southwestern Turkey.

Of course, if you don't know it yet, the Amanus Mountain oregano is the jokester of the genus—while other oreganos struggle to hide their flowers beneath their bracts, this darling sports floral tubes almost 2" long and of a bright mauve-purple color. As if this weren't enough, it insists on blooming on and on for months during the rock garden doldrums. This plant will elicit no end of idolatry.

As if the typical purple form were not a marvel enough, an albino has been found and has made the rounds of all the great British plantsmen. It is just miffy enough to expire every time I've tried to import it into the United States.

At a botanic gardens we are naturally interested primarily in plants of wild origin. Home gardeners need not have this sort of constraint, so be aware that a great array of hybrids between the previous species of oregano have been selected both in Britain and California. Many of these hybrids are easier to grow in gardens than their parent species, and many combine dramatic coloration in distinctive ways, producing plants of remarkable beauty.

A few of the best known hybrids include 'Kent Beauty', *Origanum* x *hybridinum*, and 'Barbara Tingey' All three have much greater suffusion of pink and purple in their bracts than most of the species do in their own right. A detailed description and pedigree of these and other choice oreganos can be found in the writings of Elizabeth Rollins, the leading horticultural authority on the genus, whose garden has produced many delightful hybrids.

Every *Origanum* will hybridize with every other, so imagine what peculiar plants will one day show up in the gardens of origanum oneupsmanship. The last word on origanums will not be said for some time to come. The mountains of Turkey and Greece and the Near East have at least ten more outstanding ornamental origanums waiting to spice up our summer doldrums. Please, plant explorers! Don't keep us waiting.

Drawings by Cindy Nelson-Nold.

Panayoti Kelaidis' enthusiasm for oregano began at a tender age with his mother's incomparable Greek cooking and has developed into a growing enthusiasm for all members of the mint family. He gardens at Denver Botanic Gardens.

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Bluff Mountain,

North Carolina's Natural Rock Garden

by Bobby J. Ward

Bluff Mountain is a relatively small mountain located in southern Ashe County, North Carolina, near the twin towns of Jefferson and West Jefferson (named for President Thomas Jefferson and his surveyor father, Peter). It is a beautiful mountain in a bucolic setting. For its size it has a greater diversity of plants than probably any other location in the southern Appalachian Mountains. Some of its plant species are rare because they are endemic and endangered; other species are at the limits of their range.

Landscape

The mountain sits between the north and the south forks of the second oldest river in the world, the New River, which flows northward to the Ohio. It is tucked away in the far northwestern corner of North Carolina's Blue Ridge Mountains, a stone's throw from Tennessee and Virginia. It rises from a base of 3,500' elevation and then spreads into a broad, high plateau peaking at 5,100'. Bluff is a distinctive peak that rises fairly abruptly and then slopes gently along a northeast to southwest alignment for approximately five miles.

The geology of Bluff Mountain has a major influence on its botanical character. In several areas masses of exposed base rock, primarily Roan Gneiss (pronounced "nice"), poke through the eroded topsoil. The gneiss is a blackish hornblende, a resistant metamorphic rock derived when concurrent volcanic deposits and sediment washings from the basin of the ancient Iapetus Sea were commingled, later deformed, uplifted, and then eroded through a complex of regional mountain-building episodes. The oldest of these rocks are probably just under a billion years, dating from the late Precambrian Era.

Bluff Mountain, just west of the Eastern Continental Divide, derives its name from rugged exposed bluffs, one of which drops at least 400'. Two of the bluffs, Perkin's Rock and the Lookin' Off Place, provide expansive vistas to the northwest and northeast, respectively. The peak is a plateau, somewhat bowl-shaped, with shallow soils and slow seepages.

Rainfall, as measured at the closest weather station in Jefferson (a few miles to the east and at a lower eleva-

tion of 2,900'), is just under 50" per year with a snowfall of 18"; the mean temperature is 53°F, with extreme temperatures reaching from 97°F to -20°F. No doubt Bluff itself has more rain, fogs, and snow, and lower temperatures than those recorded in the valley at Jefferson. Because of Bluff Mountain's exposures, temperatures below freezing have been recorded every month of the year. The region has recorded snow as late as May and as early as September.

To a naturalist, Bluff's interest lies in the diversity and uniqueness of its flora, boasting at least 400 species representing at some 95 plant families of monocots, dicots, ferns and other cryptogams. Three gymnosperm species are also known. The mountain contains a handsome fen—perhaps the only true one in the southern Appalachians—that supports scores of vascular plants. Bluff contains a wind-twisted Carolina hemlock forest; an old-growth northern red oak forest, where huge trunks reach skyward; a white oak community; sugar maple communities; meager saplings of the once-glorious American chestnut; and a wet meadow-glade that appears to have been at one time a part of the fen. Here on the mountain several northern species of plants reach their southern limit (either as peripheral or disjunct populations), and southern species reach their northern limit. Oddly, mixed with the montane species are Carolina coastal plain species, such as bladderwort and sundews, the latter two species found in the wind-protected fen where they flourish in the nutrient-rich ground waters. The richness of the flora here is emphasized in the extensive management plan prepared for the site by Alan Weakley (1973), who listed 42 species of plants on Bluff Mountain as either endangered, threatened, or rare in North Carolina. Thus Bluff is a floristically rich and noteworthy area. For this reason, the area was acquired by the North Carolina Nature Conservancy in 1978. Today some 750 acres of the mountain are included in the Bluff Mountain Nature Preserve, the crown jewel of the Conservancy's holdings in North Carolina.

Plant Communities

Several clearly defined plant communities exist on Bluff Mountain. A day's hike to its top and around its rim-plateau leads a visitor through different elevations, exposures, climatological conditions, soil types, moisture regimes, and vistas on the relatively small mountain top. Distinct communities may yield abruptly or give way gradually to adjacent vegetation types.

The *fen community* covers only about three acres, but it is perhaps Bluff's single most outstanding feature. It appears to be a true fen and not a bog (although there are "bog" species present), in that the source of water for the fen is ground water; the source of a bog's water is typically from nutrient-poor precipitation. The location of the fen at elevation 4,400' on a gentle plateau allows it to receive cool waters rich in nutrients from Bluff's main ridge through seepages and springs. The pH of the fen is higher than other regional bogs and wetlands. The adage that "You can't bog down in a fen" is apt here, since the stony soil averages 9" to the hornblende gneiss substrate, while the water table is barely below the surface.

Among the plants in the fen are twig-rush (*Cladium mariscoides*), grass-of-Parnassus (*Parnassia grandifolia*), bladderwort (*Utricularia cornuta*), sundews (*Drosera rotundifolia*), false asphodel (*Tofieldia racemosa* ssp. *racemosa*), and bushy St. John's-wort (*Hypericum densiflorum*). There is also

Sanguisorba canadensis (Canada burnet), bluet (*Houstonia caerulea*), blazingstar (*Liatris aspera*), nodding ladies' tresses (*Spiranthes cernua*), *Phlox subulata*, yellow-eye grass (*Xyris torta*), hog-fennel (*Oxypolis rigidior*), white beakrush (*Rhynchospora alba*), and ferns and sedges, including several species of *Carex*. Peatmoss (*Sphagnum subsecundum)* is present in spotty locations, particularly where shade is provided by taller species. In addition, there is a species of lichen (*Cladonia psoromica*) unique to the fen and Bluff Mountain, and many species of mosses reach their southernmost limit in the fen. Around the periphery of the fen are black huckleberry (*Gaylussacia baccata*), purple laurel rhododendron (*Rhododendron catawbiense*), mountain laurel (*Kalmia latifolia*), highbush blueberry (*Vaccinium constablaei*), minnie bush (*Menziesia pilosa*), and alder (*Alnus serrulata*). Some encroachment of these shrubby species is occurring in some areas of the fen, perhaps from drainage changes resulting from an old road constructed by the owners prior to the Nature Conservancy. In total, at least 140 species of plants—some rare for North Carolina—have been cataloged from this small fen.

The *forest communities* are the dominant vegetation cover of Bluff Mountain, primarily deciduous hardwoods. There are areas of large, mature trees with associated understory, some of which appear never to have been logged. One such community of northern red oak (*Quercus rubra* var. *borealis*), sugar maple (*Acer saccharum*), and white oak (*Quercus alba*) includes subcanopies of hawthorns (*Crataegus* spp.), striped maple (*Acer pensylvanicum*), mountain maple (*Acer spicatum*), and a layer of shrubs of election rhododendron (*Rhododendron roseum*), bush honeysuckle (*Diervilla lonicera*), mountain holly (*Ilex ambigua* var. *montana*), and other woody shrubs. Near the plateau is an association of white oak-red maple-sugar maple with flame azalea (*Rhododendron calendulaceum*) and laurel rhododendron (*Rhododendron maximum*). Corings reveal that some maples are several hundred years old. The occurrence of sapling American chestnut (*Castanea dentata*) in association with these old trees and the time of the chestnuts' demise suggest that this species was probably never dominant on Bluff. There are stands of sugar maple on fairly mesic slopes.

These forested communities support a diverse layer of herbaceous plants. Some areas are thick with climbing Dutchman's pipe (*Aristolochia macrophylla*), Jack-in-the-pulpit (*Arisaema triphyllum*), two species of monkshood (*Aconitum uncinatum* and *A. reclinatum*), orchid species (*Habenaria* spp.), bloodroot (*Sanguinaria canadensis*), galax (*Galax aphylla*), squawroot (*Conopholis americana*), crested iris (*Iris cristata*), three species of gentians, golden Alexander (*Zizia aurea*), mayapple (*Podophyllum peltatum*), and Gray's lily (*Lilium grayi*). The last was named for Asa Gray, who discovered it growing on nearby Roan Mt. in 1841. As the summer progresses and the frosts of autumn close in, an astounding 60 species of Asteraceae can be counted on Bluff.

Bluff Mountain is drained by at least three creeks that are spring fed and wind through coves from the slopes. In the cool, moist shade are sweet pepperbush (*Clethra acuminata*), Indian paintbrush (*Castilleja coccinea*), pink ladyslipper (*Cypripedium acaule*), two species of *Silene*, false asphodel (*Tofieldia racemosa* ssp. *racemosa*), and rattlesnake root (*Prenanthes altissima*).

Of the three species of conifers on Bluff Mountain, one species comprises a **Carolina hemlock community**

(*Tsuga caroliniana*) found on few exposed, rocky bluffs and showing a "flagging effect" because of exposure to crippling winds. In some areas the hemlock is essentially a pure stand at least 200 years old with a clean forest floor below interrupted with only an occasional perennial, shrub, or deciduous tree sapling. The other two species of conifer are scrubby forms of white pine (*Pinus strobus*) and Canadian hemlock (*Tsuga canadensis*).

Perkin's Rock, Cowface Bluff, and Lookin' Off Place are generally northwardly facing bluffs of the exposed Precambrian hornblende gneiss. In these areas a **rock vegetation community** has developed. Species in these windy locations include Michaux's saxifrage (*Saxifraga michauxii*), three-toothed cinquefoil (*Potentilla tridentata*), silverling (*Paronychia argyrocoma*), dwarf rock-cress (*Arabis lyrata*), avens (*Geum radiatum*), alumroot (*Heuchera villosa*), moss-pink (*Phlox subulata*), dwarf dandelion (*Krigia montana*), live-for-ever sedum (*Sedum telephoides*), and various species of lichens.

A **flat-rock vegetation community** occurs in a scattered patchwork just below Bluff's plateau. The terrain consists of treeless, open, flat areas that are in marked contrast to the exposed, windy bluffs. There are occasional slight depressions and small crevices where clusters of pioneer invaders such as lichens and mosses have gained a foothold on the thinnish topsoil and formed hummocks. The "island" species here include *Hypericum gentianoides*, button-rosy (*Polygala curtissii*), silverling, three-toothed cinquefoil, and Bluff Mountain Reindeer moss (*Cladonia psoromica*).

Historic Visit to Bluff Mountain

Harvard botanist Asa Gray visited Ashe County and the Bluff in July 1841. Gray and his party botanized for several days in the immediate neighborhood of Jefferson, including Bluff Mountain. He noted that Bluff and the area hillsides were heavily timbered then with American chestnut (*Castanea dentata*), white oak (*Quercus alba*), tulip tree (*Liriodendron tulipifera*), and cucumber tree (*Magnolia acuminata*). He recorded the presence of *Sedum telephoides*, *Heuchera villosa*, *Veronica officinalis*, and *V. serpyllifolia*, and *Arabis lyrata*, but on Bluff alone did he find *Potentilla tridentata*. He also described *Rhododendron catawbiense*, the other "laurel" (*Kalmia latifolia*), lily-of-the-valley (*Convallaria majalis* var. *montana*), and a "handsome Phlox of frequent occurrence in rich woods which differs from *P. carolina*" (probably *Phlox maculata* ssp. *pyramidalis*). Gray apparently recognized the significance of the area when he wrote to Sir Joseph Hooker in a letter-essay of his "Botanical Excursion to North Carolina" that he had found *Amianthium muscaetoxicum* (fly-poison), a typical low-country species of the Southeast, growing on Bluff Mountain in the open woods. Cattle, he said, were also roaming and were subject to its "fall-poison." Gray also collected several of the approximately 35 known species of *Carex* here, some unique to Bluff Mountain. He made return collecting trips to Ashe County in 1843 and 1879.

Conservation Efforts

Like Asa Gray, botanists and conservationists today continue to be attracted to Bluff Mountain and this natural rock and wildflower garden. Access is heavily controlled; this accounts, no doubt, for the relatively few visitors. The landowner, the North Carolina Nature Conservancy, provides natural history interpretive tours for no more than 15 people at a time.

Thus, while the mountain is fairly well known by naturalists, it is rare to find someone who has visited it. The Conservancy funds research projects on the mountain, some using summer student interns.

I made three trips to Bluff Mountain in 1993 with these knowledgeable botanist-guides. Later, while sifting through the 150-year old correspondence of Asa Gray, I felt some comfort in affirming that many of the plants he saw continue to have vigorous descendants on the mountain decades later. While clearly disturbed areas (some old home sites) can be found with *Daucus carota*, *Juncus* spp., *Oenothera tetragona*, and *Trifolium pratense*, and associated "weedy" invasive species, it is hoped that ownership by the Nature Conservancy has halted further disturbances.

[Bluff Mountain is a highly restricted, controlled-access private nature preserve. It is managed with the assistance of the North Carolina Botanical Garden. *Bluff is not open to the public.* It is accessible only through a private, controlled-access road. Access requires a permit or a specially arranged tour accompanied by an approved guide. For further information contact Ida Phillips, North Carolina Nature Conservancy, Carr Mill, Suite 223, Carrboro, NC 27510. Telephone (919) 967-7007.]

Bobby J. Ward is an environmental scientist who gardens in Raleigh, North Carolina.

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Two Gardens

of North Carolina's Blue Ridge

by Peter Loewer

Asheville is in the western part of North Carolina and sits on the French Broad River, atop a plateau some 2,000' high, surrounded by the Blue Ridge Mountains. The city was incorporated in 1797 and over the years has been closely identified with a number of American writers including O. Henry (who came for the rest cures), F. Scott and Zelda Fitzgerald, and Thomas Wolfe (who was born in the city).

There are more than writers in Asheville. The beneficent climate and an incredible array of native plants has been catalyzed by a more than an average number of gardeners and plant collectors, resulting in the founding of over 200 nurseries within a 50-mile circle of the city.

Just about three miles from the entrance to the well-known Biltmore Gardens (an estate modeled after the great chateaux of France, built by George Washington Vanderbilt, and including a 250-acre parkland designed by Frederick Law Olmstead), is an area of the city called Kenilworth. Here Doan Ogden, a well-known and respected landscape architect, built his home and designed his own garden as well as that of his next door neighbor.

Both gardens began in 1952 and are situated in the middle of the city, just a few blocks from a major traffic artery. Nevertheless, they still lie protected from the surrounding world and its commerce, hidden in a wooded cove at the edge of a man-made lake called Lake Kenilworth.

Kenilworth Gardens

Ogden's garden covers about nine acres and since its purchase in the late 1980s by John Cram has been known as Kenilworth Gardens. Cram has done a great deal of work on clearing aging and damaged trees, restoring trails, and adding new plants.

The Garden starts below Kenilworth dam—a curved concrete construction built in 1927 to create the 12-acre lake of the same name—and includes an authentic Japanese moss garden and rambling trails through time-honored rhododendrons.

Visitors enter The Garden through an azalea-lined drive that leads past a parking area, then winds between the Japanese Moss Garden and a stand of Kuma bamboo grass (*Sasa veitchii*). The sheltering mountains and wooded

coves and valleys on the property provide cold pockets and exceptional habitats for many plants usually found with a more northern distribution, plus other spots for many plants that are not reliably hardy, even in Asheville's Zone 7 winters. (Over the past few years, many winter nights have seen temperatures of 0°F, colder than Zone 7 is supposed to be.)

There are also a number of theme gardens, including a Rock Garden, Annual Garden, Sundial Garden, and a host of native plants and trees—1,200 at the count, last made in 1980. During the spring unusual trilliums and other wildflowers appear, including an aged *Cymophyllus fraseri (Carex fraseri)* and a mature bear grass (*Xerophyllum asphodeloides*).

A walking tour of the gardens takes about one hour and follows a winding trail that measures three-quarters of a mile. It begins at the Japanese Moss Garden and from there leads to the Upper Gardens, around a small garden pool, down stone steps past the Rock Garden and out to the open lawn, the vantage point for a stunning view of Lake Kenilworth. The lake sparkles in the sunlight and is framed in the spring by hundreds of dogwoods (*Cornus florida, C. florida* 'Rubra') and redbuds (*Cercis canadensis, C. canadensis* forma *alba,* and *C. chinensis*) blooming with the greening mountains behind.

The Lake Garden

The second garden originally belonged to Odgen's neighbors, the Hamptons. It covers about an acre and a half of terraced land, with over 300' of lake frontage. When we bought the property in 1988, it had been mostly untended for 15 years, and poison ivy,

Xerophyllum asphodeloides

bittersweet, and Japanese honeysuckle reined supreme—and still take their toll in many spots. We actually unearthed the outlines of old perennial beds and a 30-year-old dwarf boxwood hedge. That involved cutting back many vines and ousting hordes of goldenrod before the original outlines appeared.

Retaining only seven tall and stately oaks, a line of aged rhododendrons (photo, p. 17), a walkway lined with azaleas and laurels, and an untouched wooded area, our job has been to open up new gardens for my always expanding collection of plants. We continue to plant new perennials, rock plants, conifers, and ornamental grasses.

Like a house, a garden can be divided into a number of areas, each with a different theme. If these areas are walled in with hedges or borders, they can feel like individual rooms. It is this design principle that makes the great garden at Sissinghurst so appealing. The grass floor of our partially walled garden room measures 25' by 13' and is surrounded by planted borders about 5' wide.

The small trees and shrubs in this garden room include a very mature specimen of *Viburnum* x *carlcephalum*, which bears large balls of fragrant flowers in the spring and brilliant autumn foliage that turns orange-red long after other leaves have fallen. A star magnolia (*Magnolia tomentosa* [*M. stellata*]) shades many of my houseplants in the summer.

The dwarf conifers include a 10-year-old specimen of a dwarf redwood (*Sequoia sempervirens* 'Adpressa') that lived in a pot until reaching Asheville's climate; if the fast-growing upright leaders are removed, it will reach a height of only 10-16' in a gardener's lifetime (certainly not a threat to crowding). Others are a dwarf spruce (*Picea glauca* 'Echiniformis') that resembles an English hedgehog and a beautiful hemlock (*Tsuga canadensis* 'Cappy's Choice'), which bears fine-textured, light green needles tinged with gold and reaches a height of 18" in 10 years.

In addition to daylilies, hostas, a number of spring bulbs (*Tulipa vvendenskyi* 'Tangerine Beauty' is a knockout; photo, p. 17), and a continual display of rock plants. There are the more unusual perennials including Lenten roses (*Helleborus orientalis*), a Corsican rose (*Helleborus argutifolius*), a large clump of gold-banded Chinese lilies (*Lilium auratum*), and for fall, colchicums (*Colchicum autumnale* 'Waterlily') and autumn crocuses.

And gardens change: Since we took over the land, a red oak branch destroyed three rhododendrons, another oak branch smashed an aged laurel, and on the morning of August 3 when a sudden summer storm shot over the lake, an old and treasured tulip poplar fell on 30' of the perennial border. The trunk destroyed hundreds of plants and left an area that today resembles the original elephant walk.

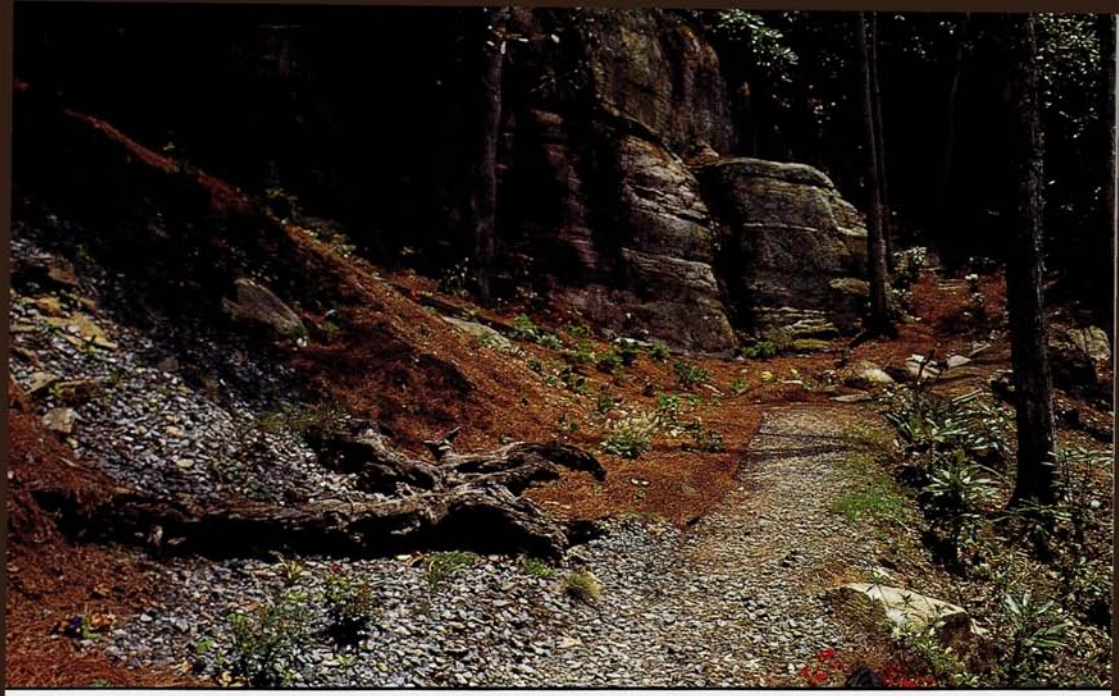
But gardens recover and it's hoped that by the spring of next year, new plants will be ready to bloom—and there are always the mountains beyond!

Peter Loewer is an avid gardener and garden writer, long-time member of ARGS, and present editor of the Bulletin of the American Conifer Society. He has been gardening in Asheville since 1989. Photo by author.

Azaleas in The Lake Garden (pp. 14, 15)

Tulipa vvedenskyi 'Tangerine Beauty' (p. 15)

Peter Loewer



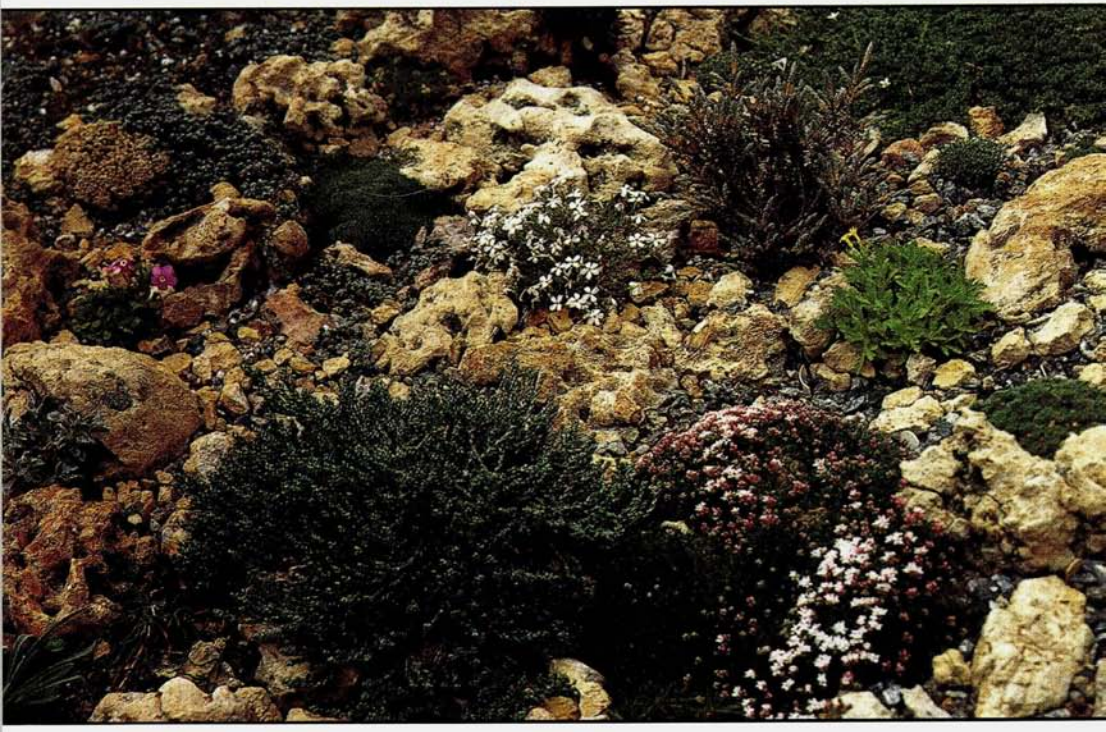
Cliff in the Whittemore garden, North Carolina Millie Blaha

Stream with self-sown *Houstonia*, Whittemore garden (see article, pp. 21-24)

Fort Courage (Whittemore's Garden) with azaleas and dogwoods

Dry stream effect, Whittemore garden (pp. 14, 15) Millie Blaha

Alpine house, tufa area, Whittemore garden (pp. 14, 15)



Rock Garden Design

Tips for Beginners

by Ev Whittemore

Don't let the words "garden design" scare you. Look on them as words that will make your garden more attractive—the first time—and save you work. I have just spent two years renovating my rock garden, correcting design mistakes, so I speak from experience.

For a new rock garden, choose a site with good air movement. Look close to your water source, to make watering forever easy. Thirdly, locate where you can easily bring supplies.

If you must have your garden in the midst of the lawn, remember it will look best if surrounding grass is kept edged and cut. You must accept this and be prepared for the work. If you plan to skip edging and mow only, realize your rock mulch should not be higher than the blades of the mower. Any large rocks near the edge of the garden will be in the way of the mower, and you will have to trim the grass there by hand, so keep these to a minimum. A garden on level ground might collect pools of water; one on a steep slope will be subject to run-off.

Don't shape your garden into a regular oval, circle, or rectangle. This is not a swimming pool. Sweeping curves are attractive and keep the base wider, so the garden doesn't seem top heavy. I use a hose to lay the lines for my gardens and paths.

Plan your soil grades and paths at this time, since it is much easier to make changes now than later. If you work best by laying everything out on paper first, do it. I like a path through, because without it people will step into the garden to see some rarity. By placing choice plants along the path, I avoid this potential destruction. The center areas of my garden contain larger, more common plants. I build my paths at a lower level than the rest of the garden to discourage people from leaving them. Make your paths wide enough for a wheelbarrow. Don't worry about your path being too noticeable. You can mulch the path with your regular rock mulch and very lightly spread mini wood chips over the gravel to distinguish it as a path.

I've read many articles on setting rocks and have finally decided not to worry about the subject any more. Sure, I'd like to have all the rocks perfectly placed, but placing them is a gift very few people have. Now in my

early sixties, I'm more concerned about the rocks being stable. I step on the rocks while weeding and planting, so it won't do to have them shift under my weight. You can't do much gardening with a broken leg.

I have found an acceptable pattern for putting several rocks together. There is space for planting, and I can balance on the rocks. Sink your rocks a bit into the ground, so they will blend into the soil. Please don't randomly dot the rocks across the garden. It looks terrible. Use several rocks together working mainly in uneven numbers, occasionally having an even-numbered group. I'd suggest a group of five rocks of different sizes with the largest in the center, set in a line. Leave at least 2-6" between the rocks for plants. At the top edge of the largest rock I'd place another above and behind it. Three more at the bottom off to the opposite side widens the base of the group and gives planting space. Between these groups of rocks place a few others for continuity and as stepping stones. Adapt your rocks to the size and shape of your garden. Realize the plants will be your main focus. Unless you are building a crevice garden, you really don't need much rock surface.

If your rocks have lines (strata), please place them so that the lines are parallel. I buy rocks by the truckload, and the first thing I do after writing the check is to separate the rocks into piles according to size and color. I make a special pile for flat rocks, to be used in walks. Our quarried rocks are brown, black, or gray. I will use all one color in any given group. If I don't have enough of one color, I'll use a couple of a second color. My next group will have at least one of the first group's colors. Of course, I'd like all one color rock throughout my garden, but I take what is available and put that wish behind. Perfection is great only if possible without excessive effort or huge expense. Rock gardening is supposed to be fun, not filled with impossible dreams and unalterable regrets

After setting the rocks I start to think of conifer placement. I have used the following idea in two of my rock gardens. It seems to make sense. You will have to decide how many conifers will fit the size of your garden, but do use dwarf ones.

1. To achieve a windswept look at the top of the garden, as in nature, use prostrate conifers like ground-hugging junipers.
2. On a lower level, place compact conifers to suggest a forest. These should be of medium height.
3. Place three pyramidal-shaped conifers at the front of the rock group.
4. Use a conifer such as a spruce on the approach to the rocks or away in the background.
5. More low conifers may be added down in the open part of the garden, especially near a path.

My next concern with design is providing a sense of unity for the garden by planting some plants in many places. Here I am practical and think of something appropriate and affordable. I like grasses that grow in tuffets; *Festuca ovina* 'Glauca' will do the job. Three pots bought at a nursery will provide plenty of material. Separate these into smaller pieces, and use them throughout the garden, using two or three clumps in a group, most at the bottom of the garden and fewer towards the top. Leave the summit of the garden near the windswept conifers bare of grass, and don't plant in a straight line.

Choose a few more kinds of plants that grow easily in your area, and use these, too, to tie the garden together.

Are *Dianthus* readily available from a nursery, plant sale, friend, or your seed germinations? Use three to five grouped together in open areas. I would never have a garden without dwarf aquilegias. I like the natural appearance of larger plants mixed in with their self-sown seedlings. Use a few drabas at the top of your garden, and they will soon seed down into a colony. Soften some of the rock edges by using ground-hugging material like genistas, cotoneasters, and sempervivums. Thymes are great for this, but remember, the flowers will attract bees. Include some dwarf iris, which will provide a good upright contrast to the rock forms.

Once you have your rocks, conifers, and continuity plants in place, you can be more creative. Personally, I never worry too much about blending plant colors or flower colors. If a poor combination appears, I will move something. Try to place plants with light color flowers at the top and those with darker flowers at the base. Flower arrangers do this, and it seems to work in gardens. Generally speaking, and depending on how fussy you are, anything goes. Silver foliage plants, including santolinas, lavenders, antennarias, and artemisias are good for softening colors.

Could it be that you're one of those few lucky people who have many plants in pots, just waiting to be planted in the new garden? If so, you can place them tentatively and move them about until you find the look that appeals to you. A garden seems to demand far more plants than I ever have on hand, so I plant first near my rocks and fill in open areas later as plants are available.

Occasionally, I will blend in two different species of plant in a single drift, using for example three plants of one kind with five of another, interplanting them. You can try three grasses with five aquilegias, or a gray-leaved *Achillea* with *Phlox subulata*, or hebes with *Dianthus*. Create these drifts across large empty hillsides, leaving the choicer material to be placed among the rocks.

Then give yourself a year to live with the garden and study it carefully. Make adjustments by transplanting. Remember you will learn as you work at rock gardening. Everyone does.

There are several general forms of rock plants, and using some of each will make an exciting garden. Tufted plants with rosettes of foliage and short flower stalks (drabas, *Erinus alpinus*, and *Silene acaulis*) look best at the highest level, in crevices and on cliffs. Dwarf erect plants not taller than 12" (*Aster alpinus, Aquilegia,* dwarf irises, and dwarf lavender) are placed in larger, flat areas and on top of ledges to give height to the garden as a whole. Drooping plants (*Alyssum, Iberis,* and forms of *Phlox subulata)* are best on steep slopes near the top and can be grown flowing over a rock face. Creeping plants (thymes, some veronicas, and *Gypsophila repens*) form close mats like carpets on the ground. Include dwarf spring bulbs, since you will appreciate their early contribution of color. With some plants from each category, you will have provided the rock garden with contrast in size, color, pattern, and texture.

If you live in a climate where your plants reside under snow all winter, you rarely need worry about winter interest in the garden. Your rocks and dwarf conifers will be of the greatest winter interest; that is why it is important to put thought into their placement. In warmer climes, consider planting sempervivums, silver and encrusted saxifrages, dwarf heathers, evergreen grasses and ferns, and dwarf *Salix* for the interest provided by their colored twigs. *Bulletin of the*

ARGS Volume 48(4) has a terrific article on winter-berried plants.

You are foolish if you omit a mulch of miscellaneous small gravel. This helps to blend in your larger rocks and make the garden look all natural and beautiful. Your plants will be happier, your weeding labors minimal, and you will conserve on water. Make your rock mulch thick enough so you can walk on it after the garden surface stabilizes without leaving footprints. If you have a pet, gravel also helps to minimize damage. When our miniature poodle, Cinq, uses the mulch as a launching pad to chase squirrels and lizards, I merely make small repairs and pick stray rocks off the plants. If you plan a larger area of conifers in the garden or off to the side, consider mulching with pine needles or small wood chips. This will give you contrast. Don't spot-mulch individual plants this way, though.

I like to incorporate an old weather-beaten stump or root within the garden. Several hours with a chisel and steel wire brush will give you an inexpensive, appropriate focal point. Use that brush until you bring out a beautiful grain. Keep all your accessories and garden ornaments compatible with a rock garden.

Try to avoid stuffing the garden too full. Leave room for growth, and don't be afraid of a few bare spaces. Some time you may be grateful for a place to put your feet while weeding or if you lose your balance.

It would be naive to think your rock garden won't need maintenance. If you don't make an effort to keep it beautiful, it will quickly deteriorate. Before you start construction, consider how large a garden you are willing to maintain. You will weed, even if you have mulched; weeds never totally disappear. Some plants will die. Remove them (when you are *sure* they are dead). If too many self-sown seedlings appear, pot them for a plant sale. You don't need large areas of your garden monopolized by an "easy doer." As you gain experience, you will become more sophisticated and want to change the garden. Try for quality, always.

I rarely throw away an outdated rock garden plant catalog, because they are terrific sources of information. In abbreviated language, you will find pertinent, concise growing instructions. Here you can check color combinations and plant sizes, avoiding errors in the garden. We receive all of the chapter newsletters and then make them available to our local members. Newsletters have wonderful articles on just about any rock garden subject that could interest you. Dues are usually modest, and anyone can join. This would be particularly helpful to ARGS members who can't attend meetings. Contact the chapter chair listed at the back of the *Bulletin* to subscribe. If a bit of studying will make your rock garden more beautiful, it is certainly worth the effort.

I've seen many rock gardens, and they all have charm. There is no perfect blueprint that will make your garden appear exceptionally beautiful to every one. Our land varies tremendously across the continent, and the same rock garden would not be equally effective in different areas. Use my ideas or adapt them. We certainly wouldn't want to go garden visiting if all gardens were the same. Your talents, tastes, and property will tell you what is best in your situation. Make your first rock garden this spring, learn from it, and keep experimenting until it reaches your dreams.

Ev Whittemore is chairing the May ARGS National Meeting and will be terribly disappointed if you don't come to see her garden .

A Country Garden
in North Carolina

by Norma Murphy

In autumn, as I walk with our dog Sunny, I notice we have our first frost. Mist rises from the ponds as two ducks glide along in the crisp morning air. The last goldenrods complement the wild blue asters flaunting their beauty in the meadow. A few mints and purple gerardia (*Agalinis*) remain.

The butterflies that were so prolific on the island just last week are now gone. I saw the last butterfly caterpillar, a plump red-and-green eating a last meal of seedbox (*Ludwigia alternifolia*). It had been dark solid red at first, changing colors as it grew. Today I look for its cocoon but cannot find it. Many monarch caterpillars have feasted on swamp milkweed (*Asclepias incarnata*) and water hemlock (*Cicuta*).

This is the wild part of the garden, with undisciplined areas that take care of themselves with one mowing a year. A path is mowed regularly, so that we can walk and access the ponds without fear of snakebite. The rewards of the ponds and wild areas are tremendous as we watch the new surprises of wildlife and flowers each day. It is never the same, as good and bad events continue to occur in nature.

I have to say we truly love water, so one priority when we looked for land thirty years ago was that it have water. The strip of land we bought lay in a cove nestled at the base of a north-facing mountain. Although it was covered with wild honeysuckle and rugosa roses, it had a stream running through the length of it. For several years we were happy listening to the sound of the waterfall and enjoying the creek as it was. Then about eight years ago, we diverted water from it to create five ponds, so that we could have water plants and fish. When you grow plants near water, you have not only their bloom, but also their reflection. Almost anywhere I work in my garden, I hear the sound of water. It brings a certain peace and serenity, the same kind you feel when you look out over a valley from the top of a mountain.

My favorite place is a small island connected to land by a spirit zigzag bridge. I think of it as my little deserted island. The tree left on it died and was replaced with a Japanese *Pinus nigra* that I am training. Every island should have a pine. *Myosotis scorpioides* lines the edge, with a few *Primula japonica, Iris pseudacorus,* and *I. laeviga-*

ta, variegated and plain, along the island and at the bridge. I made a little beach area with sand and rocks along the edges as if they had washed up on the shore.

In another area, my husband G.L. built a Japanese bow bridge. It was angled so that when you cross it, the rock garden is your point of interest. The view opposite is a small, four-year-old grouping of *Acer palmatum* that will provide lovely color and form as it matures.

Of course, I had to have a rock garden after I was exposed to ARGS slides and Ev Whittemore's garden of alpines. The only place for it seemed to be beside the boat shed where it would have a gray background for the rocks and flowers. The rock garden was small, 11' by 28', but there was room for several interesting plants, such as *Papaver alpinum*, western phloxes, *Corydalis lutea, Dianthus simulans, Pulsatilla vulgaris, Aethionema, Iris innominata*, and others. I accented it with a few conifers and a dwarf Japanese maple (*Acer palmatum* 'Kotohime'). I had always grown larger perennials but was intrigued by the tiny flowers that glowed like small bright jewels, especially when they held the early morning dew. *Phlox subulata* seemed to like the site and reseeded itself all over the garden. This is an easy upkeep area as the rock mulch keeps down weeds, holds in moisture, and offers a perfect medium for reseeding. To me, one of the great pleasures of gardening is the surprise of new seedlings blooming for the first time. You never know what to expect. It is like finding a new treasure. I enjoyed reading Laura Louise Foster's list of the ten plants she could not live without and hope that one day I will have each of them.

Up near the house in early February, *Helleborus, Crocus, Galanthus, Chionodoxa*, and other bulbs display their beauty. Later, *Trillium, Epimedium, Hosta, Uvularia, Erythronium, Mertensia, Dicentra*, various *Primula* species, *Cypripedium*, and ferns all say "Hello, it's spring!"

I think back to how this garden came to be...I really wanted a true Japanese garden but found I did not have the discipline to create one. How could I leave out all those flowers? In the end, the garden just evolved into an informal, personal place for wildlife, wildflowers, and people.

Norma Murphy gardens near Hendersonville, North Carolina.

Elizabeth Lawrence

Writes to a Gardening Friend

by Bobby J. Ward

Elizabeth Lawrence (1904-1985) was an author, gardener, and landscape architect who spent most of her life in North Carolina. She gardened first in Raleigh and later in Charlotte. Her first book, *A Southern Garden*, is in its fourth edition 50 years after its first publication, and three other books compiled from her writings have been published since her death. Of special interest to rock gardeners is *A Rock Garden in the South.*

In addition to writing articles and *A Southern Garden*, Elizabeth maintained a large and vigorous correspondence with just about anyone who shared her interest in plants. Her contacts ranged widely, from plant scientists to farm women. *"Through correspondence with gardeners in various parts of the world, I have learned that there is a bond between all Brothers of the Spade..."* she once wrote.

In the mid-1950s, Linda Mitchell Lamm of Wilson, North Carolina, newsletter editor of the North Carolina Wildflower Preservation Society (for which Miss Lawrence occasionally wrote articles), began a friendship with Elizabeth Lawrence that would span some 30 years until Miss Lawrence's death. It was a friendship born of their mutual love of gardening and horticulture. It consisted of regular visits, many telephone calls, and frequent correspondence—the majority of which Mrs. Lamm has saved.

Reading through the scores of letters written by Elizabeth Lawrence to Mrs. Lamm (between October 1960 and December 1984) is an education in itself. Her letters contain the usual personal communication between close friends about family matters. But the heart of her letters is a passion, a quest for horticultural and botanical knowledge: queries of her own or answers to questions from Mrs. Lamm. Some excerpts from these letters follow.

Designing Linda Lamm's Garden

Miss Lawrence designed a terrace and woodland garden for Mrs. Lamm's home in Wilson, North Carolina, in the 1960s and wrote,

> *"I have been re-reading Gertrude Jekyll on woodland gardens since I got interested in yours, and the parallel is uncanny: the sitting-room windows she says,*

'look straight up a wide grassy way, the vista being ended by a fine old Scotch Fir'—*just like your pine. I was afraid to say too much to you, for that is so confusing, but I felt that all of the woods needs thinning, especially the part toward the house, and that this is something you should think about as you sit in it or walk through it. Miss Jekyll has much to say on this point, especially that it has to be done with the most careful watching and that it must* 'cause interest, not confusion.' *So easily said, so hardly done. You can't decide it in a minute. You must brood."*

Later Elizabeth would write,

"I was so relieved to have your letter, and to find that the sketch for the terrace was not too late. I had open urns in mind, but perhaps the lead ones would be better so you won't have to worry about plants. Proportion is all. If you could set something up in each corner—even a bucket—and see how it looks as to size. I used to think myself feeble-minded because I had to try before deciding, and then I found that all the big gardens are done that way—just as the French design clothes on the person, the garden designers first make what they call mock-ups of garden features to see what they will look like on the spot."

As her thoughts on Linda's garden continued to develop, she again wrote,

"When I sat down to my typewriter I looked out the window and saw that the Korean daisies are beginning to bloom. They spill over the path with the weedy ageratum. I put it on the list of things to give to you. I have put a card in the box on my desk: 'Boltonia, *Japanese Aster and* Arum italicum.' *Let me know when I see you at the meeting if I left anything off.*

*"I am still thinking about the questions I didn't answer. How would it do to put the large hosta in that point left vacant in front of the late azaleas? How about putting a yucca (instead of a shrub) on either side of the gate, and then putting plume poppy (*Boltonia*) in place of the large hosta? The* Boltonia *would make a stunning plant all summer, and there would be the yucca in winter. I can give you the* Boltonia, *and I put down on your list the lovely white* Iris tectorum*; I have enough to give you a start. If you can find room for it under the bird bath it would be the thing. You should not have given me all of that beautiful moss. I put it in the stone steps at the back of the garden, and it looks as if it had been there always.*

"How would it do to plant hyacinths and tulips in pots, since they won't grow in the beds. There isn't really anything else that I can think of for spring. Have you tried the St. Brigid anemones? How about rubrum lilies? the daylily hypericum? Or Sedum spectabile*? I feel I let you down on that little square under the guest room window. Don't let me persuade you not to do a little formal bed there if you really want it. You could send me the dimensions and I could draw it. But I see it as filled with flowers. I didn't see any* Rohdea japonica *in your garden—one of the nicest winter greens, but it must not get any sun at all.*

"This year I had a lot of feverfew in the borders, and it made them shine for weeks and weeks. When I cut them back, John [Miss Lawrence's gardener] worked up a little place in the back of the bed and stuck down a lot of cuttings for next year. Another standby [for your garden] *is sweet rocket. And I think I said columbines? I like those white ones—not too long-spurred.*

"If you have a Tillotson catalog, look in it for Rosa gallica officinalis. *I have written to ask whether [they have] budded plants. I think we should have four in*

your garden—one in each of the triangles around the wheel. The peonies should also be officinalis. *I have written to the Mission Gardens to ask whether they still list* Paeonia officinalis rubra. *If not, I am sure we can get it somewhere.*

"I think Iris florentina *would be the best and I will get it from Sunnybrook Farms [Chesterland, Ohio] but let's plant the old white iris, too. They send a tiny rhizome of* I. florentina *and it takes it so long to grow—if it does grow.*

"Lavandula officinalis *is the same* L. spica *and* L. vera. *Sunnybrook list* L. vera officionalis *at 50¢. They would be very small plants. If you can find a locally grown lavender, it would really be best. Let's put lavender in each of the points.*

"The enclosed sprig is...in case you do not know it. I always get a couple of plants...in spring, as they do not last through the winter—or at least I can't count on it.

Elizabeth's Flower and Weather Reports

Miss Lawrence regularly reported in her letters on flowers and the weather, and how it was affecting her garden and plants. The detailed information she collected (and published) on blooming dates for plants in her garden, in Raleigh and later in Charlotte, has become useful, valuable information for Southern gardeners. Here are typical examples she wrote to Mrs. Lamm:

"The first flower of Amarcrinum howardii *is open. The rains have brought it out. The earliest date I have is the 27th of July and the latest the 18th of November.* Crinum moorei *is one of its parents and is about to open, too."*

Or in this exchange:

"The quince was frozen, but is coming out again. It is warm and sunny again and something new every time I go in the garden: yesterday February Silver [sic; a bicolor Narcissus cyclamineus hybrid] *and* Anemone patens *(like a large and more deeply-colored hepatica)."*

Linda recalls that on her first visit to the Elizabeth's home in Charlotte, she saw *Cobaea scandens* for the first time ever. She immediately fell in love with it. Through the years they exchanged seed and plants with each other. On one occasion Miss Lawrence wrote,

"The Cobaea *you sent me is growing fast. It spread over the holly at the end of the terrace instead of climbing into the tree."*

And later,

"We escaped our usual last of October frost, but we had a black one last night, and that is the end of the cobaea. It has been magnificent and was in full bloom yesterday. Dr. Meyer, the botanist in charge of the U.S. Arboretum's Herbarium, came down in October to make an inventory of the garden...and was much impressed to see it [the cobaea] *climbing high in the locust.* [He] *also corrected the names of several things in the garden. I hope he is right."*

In further correspondence on her fascination for cobaea, she wrote,

"I have been writing and going into the garden and coming back and writing some more. Last night I looked up and saw the first flowers of Cobaea scandens. *They are off-white the first day, faintly violet flushed the second, deeper violet the next, and finally deep purple.*

And in another letter to Linda,

"The bloom has been erratic and made little show in the garden but the red spider lilies—the early ones were better than ever and some amaryllids that hadn't flowered for years produced a scape or two: one was a pale pink Crinum *that hadn't bloomed since we left Raleigh."*

The Garden Ladies

Her correspondence with her "garden ladies" (as Elizabeth affectionately referred to the various Southern farm women with whom she exchanged seed and plants) was often mentioned in her letters to Mrs. Lamm. The correspondence with these rural housewives became the basis for Miss Lawrence's posthumous book *Gardening for Love: The Market Bulletins* (Duke University Press, 1987). In a typical example she wrote Linda,

"I didn't know you, too, had had plants from Mrs. Hides [Mississippi Garden Bulletin correspondent]. *I would like to hear about them. I have just sent her a bunch of questions, and I have identified most of the plants, but you can't take anything for granted, no matter how obvious the plants appear. For instance, is her* Houstonia *bluet? It is not likely to be the pink one or the rare boreal species,* H. serphyllifolium [serpyllifolia] *that grows on the highest mountains. She said, 'I have the little lily, too.' That is not likely to be* L. grayi *which is also boreal and grows only on top of Roan Mountain and perhaps a few other places, so I feel sure that it is* L. michauxii. *I asked her to look in* Wildflowers in North Carolina. *The wood anemone is* A. quinquefolia. *She sent that to me with a few leaves left. Ladies' Wash Board is Bouncing Bet—did I tell you that?—*Saponaria officinalis *it is, of course!"*

Miss Lawrence frequently received plants, often parts of twigs and leaves, for identification from her correspondents. In one letter to Mrs. Lamm she reported on having received a plant that was identified as *Justicia americana*. Elizabeth described the plant as

"an undistinguished plant but with delicate little orchid-like flowers."

As an afterthought she noted that the woman who had sent the plant is

"just like us. She has to know [all the plant names] too."

On another occasion she wrote,

"I think the twig Laura [Linda Lamm's sister] brought me from Chapel Hill must be the English cherry laurel Prunus laurocerasus*—a narrow leafed form of it. But I will take it with me to Chapel Hill when we go and ask Bill Hunt to find out for certain. Laura also brought me some snowdrops. My fall one,* Galanthus corcyrensis [G. nivalis reginae-olgae], *hasn't bloomed yet."*

In sending Linda an envelope stuffed with two market bulletins for plant sources, Elizabeth penned a P.S.:

"What do you think the flora on the [6¢ South Carolina commemorative] postage stamp is—yellow jessamine and cotton? I do hope I included enough postage."

The Poetry of Gardening

Elizabeth Lawrence often freely mixed literature and poetry with gardening in her correspondence with Linda Lamm. Prompted by a newspaper clipping

that Linda had sent her about Hope Plantation in northeastern North Carolina, Elizabeth recalled her first visit there and her agreeing to do the garden; she recommended including sweet bay and sassafras because she had seen it growing along the roadside and knew that it would grow in the Hope Plantation garden. The owner was delighted.

Elizabeth wrote Linda that a few days after she got home from Hope Plantation she found in chapter eleven in *Jane Eyre* just how the grounds should look at Hope:

> *"I figured that Thornfield could be about the same period as it was an old house when* Jane Eyre *was written, and from the roof Governor Stone would have seen the same sort of thing that Jane saw when she went with Mrs. Fairfax up the ladder and through the trap door:* 'The bright and velvet lawn closely girdled the gray base of the mansion; the field, wide as a park, dotted with its ancient timber; the wood, dun and sere, divided by a path visibly overgrown, greener with moss than the trees were with foliage....' *As there is nothing to go on, I thought the planning should be simple and informal, and largely of plants already growing there, which could have been used, even if they weren't."*

Elizabeth went on to say that she hoped that the garden committee at Hope would accept her complete planting plans for the garden design.

On another occasion Elizabeth sent Linda a few lines of poetry that she had been sent by a friend from an 18th century garden book, called *Digging and Squatting*:

If my garden grows
The whats,
It grows on
Squats.
Spades and rakes
Do truly not
Beat a squat.

A shared pleasure between Elizabeth and Linda was a book of the 19th century diaries of Francis Kilvert, a vicar at Saint Harmon near the Welsh border in England. His diaries over a ten-year period recorded the landscape and the people of his parish.

> *"Kilvert's is just what I am looking for, and I have sent to England to ask about it. It is all about country parishes, old ladies, and flowers for the altar,"*

she wrote Mrs. Lamm on one occasion after Elizabeth had attended a reading of excerpts from the diaries that had been arranged by Linda's sister Laura in Charlotte.

In planning for Mrs. Lamm's daughter's wedding, Miss Lawrence found an appropriate note to pen her:

> *"I feel sure that I will have some Lenten roses* [Helleborus orientalis] *for the wedding. The problem is to make them keep, but I shall try Miss Jekyll's method of slitting the stems—and as she says,* 'They are inclined to droop; it is the habit of the plant.'"
>
> *Aff*[ectionately,] *Elizabeth*

Elizabeth Lawrence's Legacy

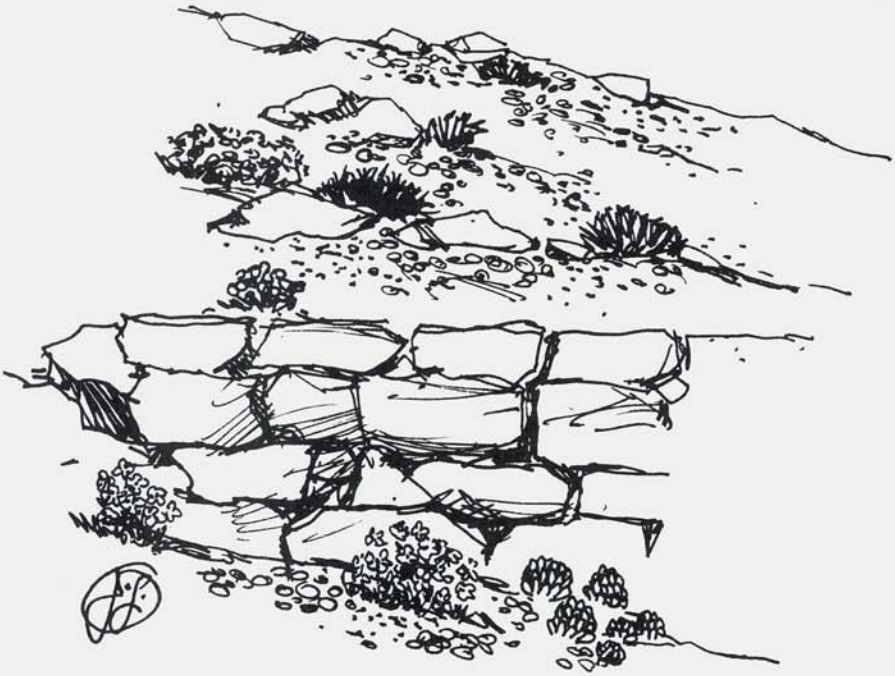
Nine years after her death, Elizabeth Lawrence continues to have devotees and admirers. Now we are enjoying a renaissance as "new" gardeners are discovering her writings. Her books remain in print. With the exception of 144 of her original articles from the Charlotte (North Carolina) *Observer*, which were published in *Through the Garden Gate* (University of North Carolina Press, 1990), none of the remaining 576 Sunday columns have been readily available. Thus, there is still material to be unearthed for a contemporary generation of gardeners.

In one of her letters to Linda Lamm, Elizabeth unwittingly summed up her own life with this quote of Robinson's injunction to Tristram (that she had stumbled upon in Aldo Leopold's *A Sand County Almanac*):

> "Whether you will or not
> You are a King, Tristram, for you are one
> Of the time-tested few that leave the world,
> When they are gone, not the same place it was.
> Mark what you leave."

Elizabeth Lawrence indeed left a mark on the world of garden writing.

Excerpts from letters reprinted by permission of the Elizabeth Lawrence estate, Warren Way, III, executor.



Unusual Plants

to Accompany Your Rock Garden

by J.C. Raulston

Our collection of plants at the North Carolina State University Arboretum in Raleigh, North Carolina, includes more than 6,000 different species and cultivars of plants from at least 45 countries. The Arboretum is located in USDA Hardiness Zone 7, at an elevation of about 400', with an annual rainfall of 43". Here we evaluate plants for heat and cold hardiness, esthetic appeal, drought tolerance, disease resistance, and other qualities in order to choose the best selections for the landscapes of the southeastern and mid-Atlantic states. Promising plants are promoted through the nursery trade by means of a plant introduction program. The plants have been acquired from almost every imaginable source: commercial nurseries, seed exchanges and cuttings from public and private botanic gardens and arboreta, and seed from native plants in wild stands.

Those plants that are superior and well adapted to the local climate help enrich the landscape and provide a basis for more diverse, more environmentally sound gardens across our region. Listed below are a variety of uncommon plants evaluated in trials at the NCSU Arboretum that have a wide variety of landscape uses. I have selected a range of plants including herbaceous perennials, ground covers, deciduous and evergreen shrubs, vines, and trees and conifers. While some of these plants are new and difficult to obtain in some regional nursery markets, they all have some ornamental feature that commends them for more widespread garden use.

Acanthopanax sieboldianus 'Variegatus'—Variegated five-leaf aralia (Araliaceae). This plant was chosen for the beauty of its white-variegated foliage and great tolerance to unfavorable conditions and difficult urban environments. It is tolerant to drought, shading, soils varying from sand to clay and acid to alkaline. It has no major insect or disease problems, and though it can reach 7' in height it can be easily controlled by heavy pruning. The stems have short spines and when sheared can be an excellent pedestrian barrier. Adapted for zones 4-8.

Ardisia japonica 'Chirimen'—Japanese ardisia (Myrsinaceae). A need always exists for good ground cover plants for use in landscape plantings. This relative-

ly unknown species grows as an evergreen carpet in moist woodlands of Japan, Korea, and China. The Japanese have selected many cultivars of varying size, foliage color and hardiness. 'Chirimen' has proved to be the hardiest and more dependably evergreen for us. It grows 3-4" in height in dense, solid, green mats with white flowers in spring followed by bright red berries in the fall. Propagation is by tip cuttings or division of the clumps any time of the year. Grow it in zones 7-9 under shady conditions with moist, well-drained soils.

Hosta yingeri—Yinger's hosta (Liliaceae). A new species of hosta resulting from our 1985 expedition to Korea. It is named for Barry Yinger. The leaves are thicker and glossier than most hostas.

Hydrangea 'Pia' (Hydrangeaceae). This is a beautiful dwarf, dense-growing cultivar that will eventually reach 2' in height. It has 4"-diameter inflorescences of many pink to purple flowers (color depending on soil pH) in early summer. An excellent compact plant for shady areas. Zones probably 5-8.

Magnolia grandiflora 'Little Gem'—'Little Gem' Southern Magnolia (Magnoliaceae). This is a compact form with leaves and flowers about one-half to one-third normal size, maturing at about 10' wide and 20' tall in 25 years. Plants bloom heavily from early summer to frost even when just a few feet in height. This plant was collected by Warren Steed at his North Carolina nursery in 1960. Adapted for zones 6-9.

Morus bombycis 'Unryu'—Contorted mulberry (Moraceae). We obtained this dramatic deciduous tree from a Californian collector of rare Asian plants in 1981 and took several years to trace down a name for it. The leaves are large, shiny, and attractive; the real beauty of the plant is when the bare, twisted corkscrew branches are silhouetted against the winter sky. Zones 5-9.

Nandina domestica 'Alba' and 'San Gabriel'—Heavenly bamboo cultivars (Berberidaceae). 'Alba', the white- or yellow-berried heavenly bamboo is an old cultivar with pale whitish-yellow fruit and green foliage. 'San Gabriel' has greatly reduced leaflet blade tissue creating a very delicate and lacy effect on shortened plants. Zones 6-9.

Ophiopogon juburan 'Variegata'—Variegated ophiopogon (Liliaceae). An exceptional broadly variegated foliage plant which belies the fact that it *is* an *Ophiopogon*. It has been slow to multiply since we collected it in Korea in 1985.

Pinus taeda 'Nana'—Dwarf loblolly pine (Pinaceae). Our collection at the arboretum at NCSU arose from seedlings from a "witches' broom" found in the wild. The slow-growing seedlings eventually have dense, rounded crowns. It is perhaps one of the most beautiful and useful potential landscape plants for Southern gardens, but it is difficult to produce (side-veneer grafting on seedling loblolly understock). Zones 6-9.

Poncirus trifoliata 'Flying Dragon'—Flying Dragon trifoliate "orange" (Rutaceae). A unique and dramatic Japanese cultivar of this hardy "orange"

species that has curved and twisted stems and beautifully curved thorns. A deciduous shrub reaching 8-9' with age that bears white flowers in spring and showy yellow "oranges" in autumn. The branches can be cut and used fresh or dried for floral arrangements.

Rosa 'Petite Pink'—Petite Pink rose (Rosaceae). This rose is a cultivar discovered on a old plantation on the Cape Fear River in Wilmington, North Carolina. It produces a low, dense, suckering shrub about 2' tall, covered with pink flowers in early summer. The foliage is delicately cut, shiny, and quite handsome. There is a need for a good tough commercial ground cover for us in difficult sunny areas to dilute the overwhelming use of junipers. This plant is the heir-apparent.

Syringa oblata var. *dilatata*—Korean lilac (Oleaceae). Yes, *the* plant that northerners miss most when they move south are the wonderful lilacs, since most of them will not take the heat. The is the best one for the South from our trials. It blooms early in the spring and takes our tough soils.

Styrax japonicus 'Sohuksan'—Sohuksan snowbell (Styracaceae). A deciduous flowering tree from Korea with much larger foliage and flowers than any other cultivars now existing. Flowers within a given cluster may have two to seven petals rather than the standard five, which may indicate the selection is a polyploid. Polyploidy would also explain the increased size of the other plant parts.

Viburnum awabuki 'Chindo'—Chindo viburnum (Caprifoliaceae). A broad-leaved evergreen shrub-tree from the Korean expedition with red fruit superior to that of the species currently in the nursery trade. Excellent plant that has the potential to replace red tip photinia as a border shrub.

This list of plants presents only a few of the many promising plants that have been evaluated in trials at the NCSU Arboretum. Perhaps the most appealing part of the gardening world to me is the knowledge that after I garden for 90 years or more, there will still be an enormous unexplored fascinating world of wonderful new and different plants to observe and learn about. Often observing how or why a "new" plant fails in a garden can lead to the knowledge of how to successfully handle it in a repeated trial. To be sure, there is a great amount of truth in the philosophy expressed by the outstanding plantsman, Sir Peter Smithers, when he said, *"Every plant is hardy until I have killed it myself."*

Plan—and plant—for a better world.

J.C. Raulston is professor of horticultural science at N.C. State University and is the Director of the NCSU Arboretum. He is the 1991 recipient of the American Rock Garden Society's Marcel LePiniec Award given for increasing the richness and diversity of plant material available in our landscapes and gardens.

A Few Gentianaceae

of the Andes

by David Hale

The remarkable Andean members of the Gentianaceae differ in such unusual and beautiful ways from those we know in cultivation that I think they deserve special mention. Those discussed below reside in Ecuadorian and Peruvian alpine areas.

Gentiana sedifolia (photo, p. 37) is one of the few true gentians in South America. It is a wee plant covered with flowers in shades of blue or white. It flowers and sets seed well in cultivation.

The largest group of Gentianaceae in South America is the gentianellas. Some species hold their flowers closed, forming inflated ball-like flowers. The most striking is *Gentianella hirculus* (photo, p. 61), the flowers of which appear to me like a cluster of red-striped, bright yellow hot air balloons floating just above the mat of foliage. The two plants I have seen flower in cultivation unfortunately seemed to have lost their bright red vertical stripes.

Gentianella peruviana is a pure-white-flowered, 4"-tall plant. But the most striking Peruvian gentianellas come in yellows and reds. *Gentianella saxicola* (photo, p. 61) and *G. vaginalis* are similar in appearance—tiny-leaved mats with acaulescent, bright red to red-orange to coral-red flowers standing only 1-2" high.

Gentianella incurva is more robust, growing in tussock-plant communities, reaching 6-8" in height with large, bright yellow flowers aging a beautiful peach color before fading. Of somewhat taller stature and appearing to be a short-lived perennial is *G. weberbaurii.* It has vermilion-red, tubular, flared flowers clustered by the dozens on 14-16" scapes. The buds are crimson.

Lastly, and not appearing to be a gentian at all, but rather more like an *Aquilegia*, is *Halenia weddelliana.* Seen frequently in Ecuador, it is very unlike its Himalayan counterparts. It grows to only 4-8" in height and has bright yellow, spurred flowers. In cultivation, it retains its compactness and flowers well.

David Hale is an enthusiastic grower of choice plants. He gardens in Portland, Oregon, and on the Oregon coast, and travels widely in search of plants.

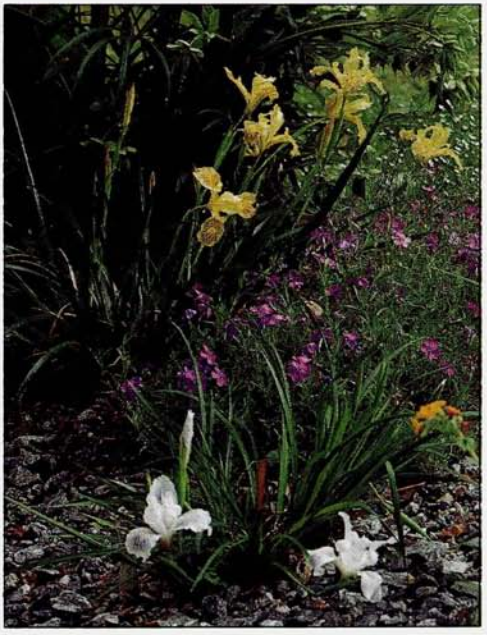
Gentiana sedifolia (p. 36) Ned Lowry

Gentianella rupicola (pp. 244, 256, Vol. 51[4])

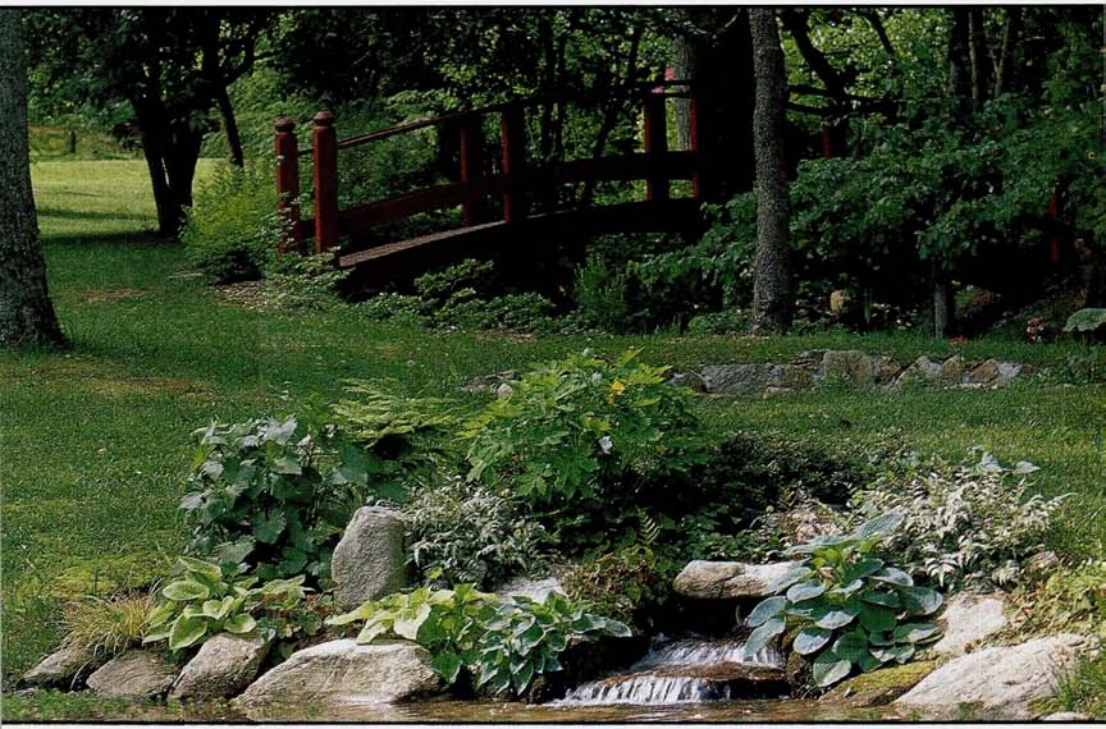
Island with *Iris pseudacorus, Myosotis, and Primula,* Norma and G.L. Murphy Garden (pp. 25, 26)

Cypripedium calceolus (p. 26)

Iris innominata (p. 26)



Norma and G.L. Murphy Garden (pp. 25, 26) photos, G. L. Murphy



Trillium grandiflorum, population in Upper Michigan (pp. 45-49)

photos, Frederick W. Case, Jr.

Trillium grandiflorum, typical fresh flower (p. 45)

Trillium grandiflorum, normal plant with dwarf, diseased plant (p. 46)

Trillium grandiflorum, Smith's double (p. 48)

Trillium grandiflorum, infected with mycoplasm (p. 46) Frederick W. Case, Jr.

Trillium grandiflorum, flowers of mycoplasm infected plants (p. 46)

Trillium grandiflorum, wild double (p. 48)

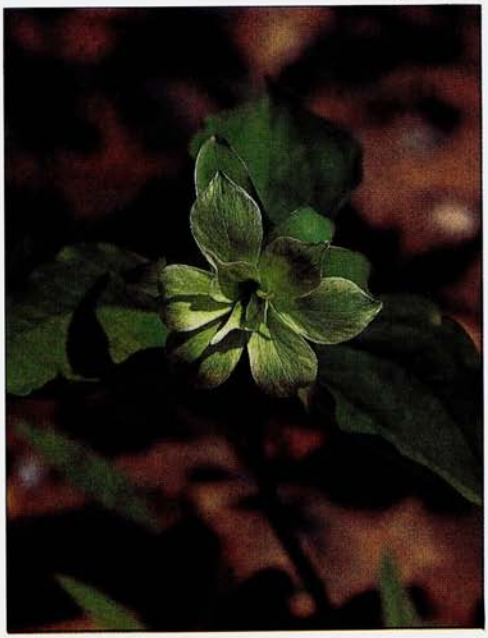
Trillium grandiflorum, wild double hose-in-hose (p. 48)

Trillium grandiflorum var. *roseum*, plants of the Blue Ridge (p. 47)

Frederick W. Case, Jr.

Trillium grandiflorum, faded, aging flower (p. 45)

Trillium grandiflorum, natural green double (p. 48)



Trillium grandiflorum:
Doubles, Forms, and Diseases

by Frederick W. Case, Jr.

No American wildflower is more popular than the large white trillium, *Trillium grandiflorum* (Michx.) Salisbury. This plant produces its beautiful flowers in April or early May, from the uplands of Georgia north along the Appalachian Mountains to Maine and Quebec. Westward, it extends from Quebec and New England across southern Ontario and Michigan to Minnesota. South of the Great Lakes States in the Midwest it occurs only in isolated populations or is absent completely. Perceived by some, especially along the East Coast (where it has always been quite local) as becoming very rare, it actually grows in vast populations in Ontario, Michigan, Wisconsin, and Minnesota (photo, p. 40). It is the provincial flower of Ontario. Across its great range, it shares habitat with several other trillium species, yet no hybrids have ever been substantiated.

With such a broad geographic region considerable variation naturally might be expected and is in fact present. The usual floral variations—larger and fuller petals, smaller than normal flower parts, and narrow-petalled flowers—all occur. But additional variations also appear. Some arise from genetic mutations, some result from disease. Let's consider the variation within this species.

Abnormal Forms of the Plant

The normal large-flowered trillium bears an erect, three-petalled, pure white flower on a peduncle of moderate length. Petals are of a soft yet firm texture with slightly engraved veins visible (photo, p. 40). Typical flowers open white and maintain that color for a few days to a week or more, depending upon temperatures at blooming time. As the flowers age, a deep pinkish-purple hue develops, sometimes so intense as to approach red, but rather dull or lackluster.

Two- or four-petalled forms occur, often accompanied by two or four leaves and sepals. Such forms are most commonly the result of cell division errors in the bud, perhaps induced by injury, and the following year the same plants are normal three-petalled, three-leaved trilliums. Only very rarely do such forms appear to be genetic and permanent.

Other startling forms occur. Sometimes a plant will appear with

green, leaf-like tissue down the middle of each petal. Other variants include all green petals; abortive and distorted green or green-and-white petals; no petals at all; only knots of sepals; and doubling of petals accompanied by greening and distortion of petal shape. Changes in leaf shape accompany these aberrant forms, the most frequent being long petioles on the normally sessile leaves, or no leaves at all. Some of these forms seem to stabilize and reappear with slight variations for several years. In others, the plants become more and more fantastically deformed each year, gradually deteriorate, and die.

These peculiar forms, formerly thought to be mutations, result from infection of the plant by mycoplasma organisms (see Hooper, Case, et. al., 1971). Mycoplasmas are subcellular creatures midway in size between viruses and bacteria. The ultimate parasites, they cannot exist independently of a living host, yet they possess cell membranes. In some as yet poorly understood manner, they induce in their host mutation-like changes. In experimental studies with other plant hosts, the host has been cleared of these organisms through the use of certain antibiotics and heat treatments.

How mycoplasmas get from trillium to trillium is not proved, but we suspect that they are vectored by leaf hoppers or some other sucking insect. Mycoplasmas cause the tissue greening, lumping, and distortion found in parrot tulips and are also the cause of aster yellows disease.

Some infected *T. grandiflorum* plants are very attractive. Diseased plants have been offered for sale, and many gardeners desire them or keep them. Unfortunately, infected plants are bad news to the wildflower gardener, for they represent a source of infection for other trillium plants and species.

In western Upper Michigan in deciduous forests on limestone soils a very dwarf form of *T. grandiflorum* can be found growing with normal types (photo, p. 40). This plant was first brought to my attention by botanist/artist Don Henson and was also featured as a possible new species in an Escanaba, Michigan, newspaper article. If you dig up the rhizome of such a plant, you will usually find a large rhizome that has partially rotted and diminished in size at the growing end from which sprout the dwarfed flowering stems. If you examine the flowers, you find a narrower, more conical ovary than normal, often without developed ovules. Most plants I have examined have abnormal anthers and do not produce seed. From these symptoms, it seems obvious that some pathogen is dwarfing the plants, rotting the rhizome, and producing sterility. The nature of the pathogen has not yet been discovered, nor have we seen this abnormality except on limestone soils.

Color Forms

Over most of its range, large-flowered trillium produces white flowers fading to the dullish pink-purple with age. One outstanding color form is known and sometimes cultivated. This is *T. grandiflorum* var. *roseum*, or forma *roseum* of horticulture. The Royal Botanical Garden, in Edinburgh, Scotland has massive plantings of this beautiful form, but their record of its origin is obscure, only recorded as being from Virginia. Along the Virginia Blue Ridge, pink-flowered forms occur at several widely separated spots for over a hundred miles.

In the Blue Ridge form most flowers open white or faintly pink. In a few hours to a day or so, the color intensifies into a vibrant warm pink with peach or salmon overtones. The color

is much warmer and more attractive than the pink induced by aging of the petals (compare photos, p. 44). Some clones can be very dark pink, even immediately upon opening of the flower. Dr. Richard Lighty has seen a form which he avers to be a cerise-red.

In the *roseum* form, the leaves frequently have deep wine undertones superimposed upon deep green. As the flower ages, the typical dull pink petal tones appear, intensifying flower color. In short, *Trillium grandiflorum* forma *roseum* is striking, and a favorite of mine amongst the many trilliums we grow.

We have located but one Michigan population that produces a few plants that open pale pink flowers or flowers that develop pink color almost at anthesis, but these cannot compare with those from the Blue Ridge colonies.

From this Michigan population we have obtained two or three clones which have a light salmon color and whose petals seem to have the veins engraved much deeper than most. These are most unusual and may be garden worthy.

We have isolated plants of *roseum* forms from Edinburgh, Virginia, and Michigan together in hopes that bees will cross-pollinate them and produce intensified colors.

One caveat: soil type, pH, and soil and air temperatures can affect the intensity of pink color in the flowers. One official at Edinburgh told us that their deep pink form transplanted to warmer lands loses much of its color. The Blue Ridge plants have performed well here for us, at least so far. Dr. William McClements of Delaware, who graciously guided us to some fine pink colonies, reports the plants retain their good pinks for him.

A computer printout of the trillium collection of the Royal Botanic Garden, Edinburgh, also lists a *T. grandiflorum* 'Jenny Rhodes', a form or cultivar about which I have no information.

Double-flowered Forms

Most spectacular of all *T. grandiflorum* forms are those with added petals. According to *Gray's Manual*, 7th ed., double-flowered plants fall under the legal botanical name of forma *petalosum* Louis-Marie (not *flore pleno* of hort.). But all double forms are not alike.

One form which is very occasional is a "hose in hose" type, that is, there is one perfect set of petals within another set, and alternating with them. Such flower forms are frequent in some hot-house azaleas. In *Trillium grandiflorum* such forms have six petals and usually retain at least part of their reproductive structures (ovary, pistil and stamens). When the doubling produces uniformly shaped petals, such a form can be very attractive. Not all hose-in-hose forms are genetically fixed; some result from developmental accidents and revert to normal in subsequent seasons.

In some forms of doubling all flower organs are converted to petals and repeated many times. This results in a full flower of great beauty, resembling a fully double peony or camellia in miniature. Such forms make especially valuable garden plants, for they produce a better show of color. Multiple petals seems also to confer upon the flower longer lasting qualities.

Fully double forms are not all identical either, as the mutation has occurred many separate times in populations with different basic features. One of the very finest is widely cultivated. I obtained my plants from Harold Epstein many years ago. In this form the numerous petals are broad, with parallel-sided, undulating margins abruptly tapered at the tip to a

dull point, producing an almost rectangular petal. The petals in each succeeding rank towards the center are diminished a bit in size, producing a wonderfully full, pleasing flower (photo, p. 41). The plant is a fairly rapid clump former and a first rate horticultural subject. Mr. Epstein informs me that he obtained the plant via a Mr. Henry Toisha, horticulturalist, who obtained the plants from a W.A. Smith. Smith discovered the plant in the wild near Rochester, New York , many years ago. Toisha referred to the form as "var. plena," a name of no botanical standing.

A few years ago a student in one of my adult education wildflower courses told me of a woods with many double trilliums. Eventually I was shown the woods and found 37 distinct clones bearing double flowers, all completely sterile. As the area was being developed and the woods gradually cleared, we were permitted to collect about half the clones. These have subsequently bloomed here, and there is some variation.

In the most vigorous clump former of these, the flowers are huge, with tapered petals, the petals gently reflexed and very numerous. The result: a very full, large flower, almost too heavy for its own stalk, yet very attractive (photo, p. 43). Another form from this woods bears petals in a multiple hose-in-hose effect, with many ranks of petals repeated, each rank inward diminished in size and stacked up in line with the one before it, rather than alternate. The result is a strikingly handsome starburst flower, one of the very best (photo, p. 43). A number of other variations of these two forms occur in this population. At present I am trying to grow them on and identify the most vigorous forms. I hope that eventually I can introduce them, but they are not available at this time!

Although I have never found a fully double, all-white-flowered *T. grandiflorum* in the wild myself, at least six of my students have. I have now in my possession about 20 different fully double clones, all sterile, to work with.

I have one double with green-stained and -streaked petals. My first impression was of a mycoplasma infection, but the plant has persisted for over 20 years, unchanged each year, and seems healthy. It is very interesting (photo, p. 44).

Last year I found a double of similar appearance, but larger-flowered, with petals alternating between typical petal and sepal shape. The result was an almost spiny starburst. It is possible that mycoplasma infection produced this form; I shall isolate the plant for a trial.

All of these double forms, if stable and not disease-induced, make highly desirable garden forms. Most clones will grow in any reasonably well-drained soil. In the wild all forms of the species prefer a rich neutral soil such as that found in rich upland woods of beech and sugar maple. Less commonly, the species also grows in slightly to moderately acid soils of mixed deciduous, pine, and hemlock woods. Because most of the double forms are sterile, propagation will be quite slow unless a successful tissue culture method for adult trilliums appears. (For insight into the methods and problems of trillium propagation by notching the rhizome, and the problems involved in tissue culturing from adult trillium plants, see my boxed article in *Fine Gardening*, July/August, 1988.) Some clones of *T. grandiflorum* produce offsets regularly; some rarely or never do. Since clumping produces a better garden show, ease of offset formation ought to be a consideration in selecting good forms for horticultural introduction.

Many gardeners consider *Trillium grandiflorum* to be the finest of all trilliums in all respects. Certainly in terms of ease of cultivation, flower size and showiness, it is the best of the eastern American trilliums, and deserves its place as one of the most popular species in gardens worldwide.

Drawing by Carolyn Crawford.

Fred Case has been gardening for over 40 years, 36 of them near Saginaw, Michigan. He and his wife Roberta have botanized most of North America, concentrating on the Great Lakes, the southern pitcher plant country, the high mountains of the West, and Alaska.

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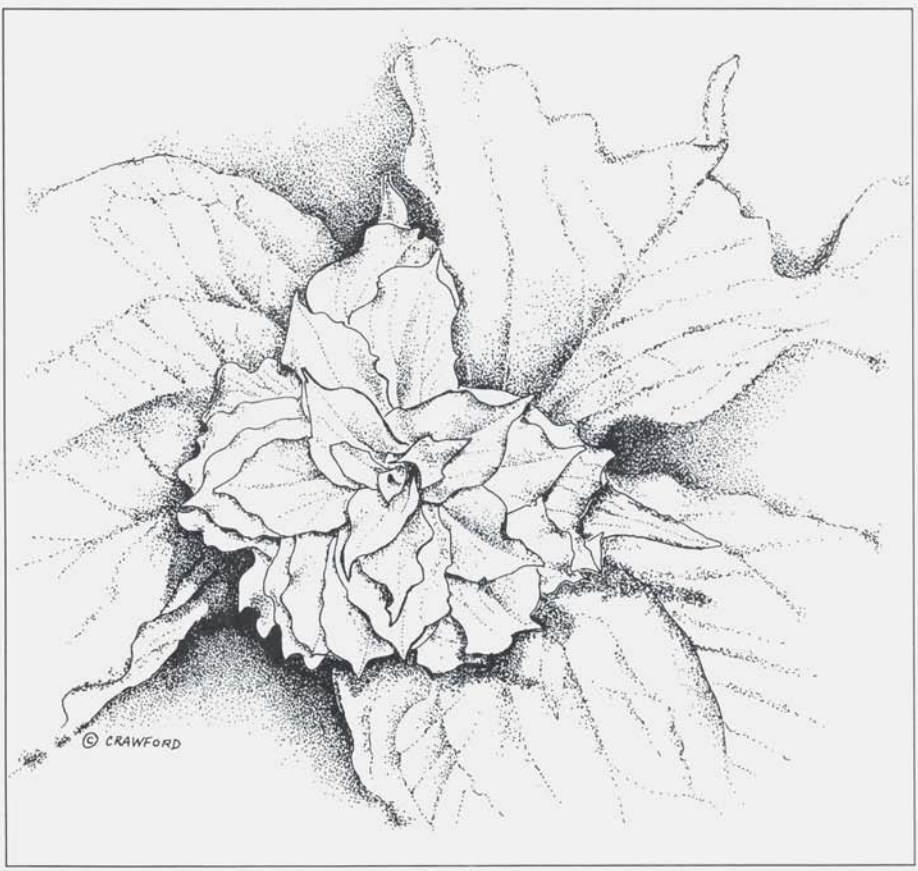
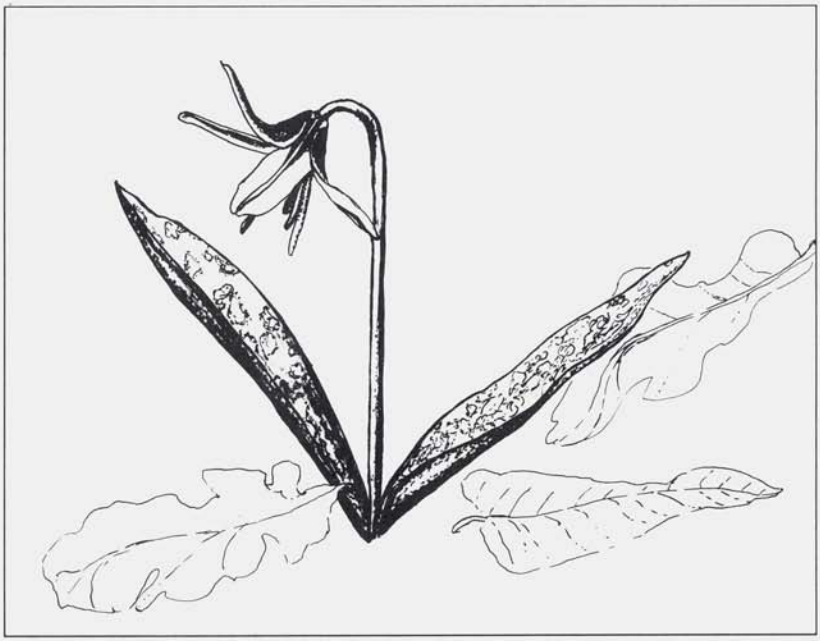
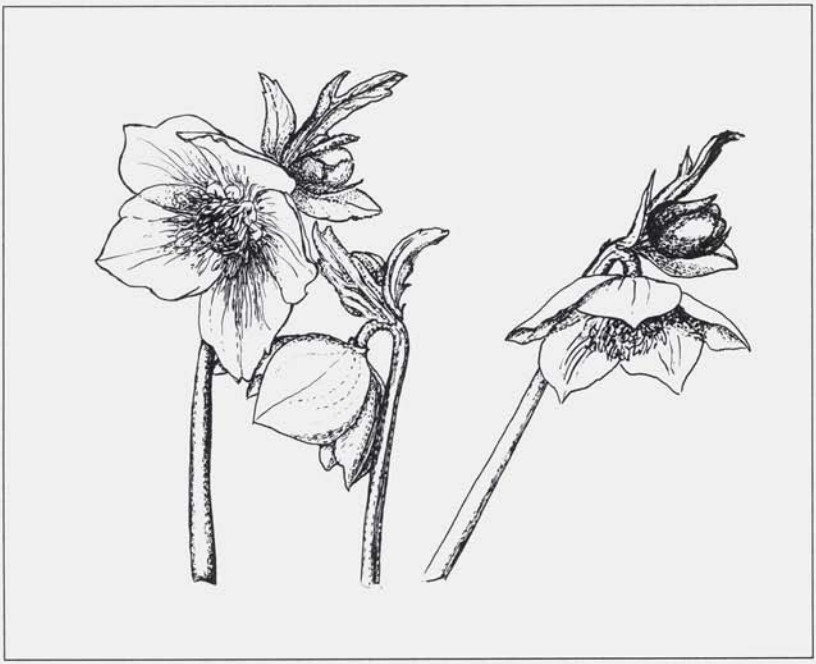


Trillium grandiflorum, double-flowered form, from photo by Frederick W. Case, Jr.



Erythronium dens-canis in Poplaca Wood

Helleborus purpurescens in Poplaca Wood



Hellebores, Hepaticas,
and Other Plants Visited in Romania

by Matt Bishop

Having kept a collection of *Hepatica* species and cultivars for the National Council for the Conservation of Plants and Gardens for several years, I had long wanted to see these plants in their wild state. Romania was the natural choice for exploration, since it is the only country in which *Hepatica transsilvanica* and *Hepatica nobilis* are both to be found.

I could never have envisaged that the researching and organizing of the trip would be such a mammoth task. Initially and rather naively, I had planned to go alone, but I was given advice from several people that this was not a good idea, and so I invited Andrew Caverly, who had been at school with me at Wisley, to come along.

It was challenging to find information either on the country or its plants, not to mention to obtain decent maps. One of our only sources of information was a rather aging copy of *Flora Republici Romania*, which was useful in giving localities where the plants had once grown, but offered no information about whether these populations still existed. So in a sense, we were going into the unknown, which made the trip all the more appealing for me.

As we intended to collect small quantities of living plant material, another major obstacle was obtaining a phytosanitary certificate. Unfortunately, this can only be issued in the country of origin of any plant material. Attempts to contact the Romanian Ministry of Agriculture all came to naught. Uncomfortably close to our date of departure, we were given the name of a Romanian Doctor of Botany specializing in the Transsilvanian flora. I immediately wrote in the hope that he might know something or someone we didn't. Ten days later I received his letter offering to help us with any necessary documentation. I was ecstatic. We flew out in late March with much excited anticipation for what promised to be a memorable trip.

Our priority was to study hepaticas and their ecological companions in as many localities as possible. My interest was centered around *Hepatica transsilvanica*, which was revised by a botanist named Karpati in the 1940s. *Hepatica transsilvanica* was split into a bewildering array of taxa ranked as forms: H. *transsilvanica* forma *transsil-*

vanica, H. transsilvanica f. *obtusata, H. transsilvanica* f. *acerifolia, H. transsilvanica* f. *pseudomedia, H. transsilvanica* f. *rhodantha,* and *H. transsilvanica* f. *leucantha.* Leaf shape seems to have been the main distinguishing characteristic between forms. But were these forms found in separate populations, each with plants of uniform appearance, or were several forms to be found in single colonies? *Hepatica nobilis* had also been subdivided into several forms, the most interesting of which were f. *rotundata* and f. *multiloba.* We had localities for each.

The removal of any living plant material from the wild remains a controversial issue, and bearing this in mind we decided to collect only small divisions of the very best plants we saw, and then only from large colonies. We hoped in this way to improve on stock now in cultivation.

Having to predetermine dates for a two-week period in Romania left little room for error though we were reassured by consulting herbarium sheets at Kew and people who had traveled to bordering countries that our timing was about right.

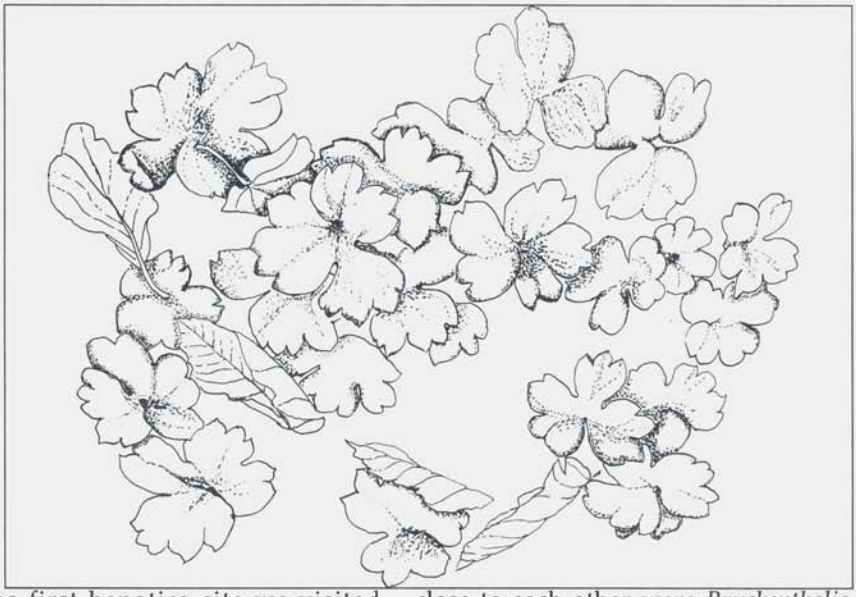
Within two days of arrival, we realized that we would have to amend plans to travel north to the Rodna Alps. The roads, already peppered with potholes, were treacherous with snow. Some of the tires on our rented car had already fallen casualty on the first night of the trip, and another was bulging ominously. On the way to Sinaia we lost control of the car on an icy, hairpin curve, and our already shot nerves were finished off.

We were told that eastern Romania is far colder than the western part. As we left the mountains around Brasov, heading to Sibiu, we crossed vast, open plains, and the snow quickly disappeared. Floristically, the plains, almost entirely cultivated, were fairly uninteresting. Close to Vladeni there was a large field boggy with meltwater where we saw a scattering of *Crocus vernus* ssp. *heuffellianus.* Flower color ranged from pale lilac to deep purple. Particularly attractive were a few of the plants showing intense violet-purple, apical smudges against a paler background.

When we reached the hills that surrounded Sibiu, the flora became more varied. At Bradu Wood, we stopped to change the tire, which looked dangerously near blowing out. We were rewarded by a sighting of *Asarum europaeum,* which scarcely resembled the plants grown in gardens here. The leaves were thin, densely hairy on both surfaces, with no hint of glossiness. The overall color was deep green with a bit of purple between the veins. The woodland consisted mainly of oak and hornbeam, quite dense in places. Close by we also saw *Pulmonaria angustifolia* and *Erythronium dens-canis.*

At the Natural History Museum in Sibiu we had the opportunity to look through herbarium sheets, particularly hepaticas and hellebores. More importantly, we were able to examine the original Fuss type specimen of *Hepatica transsilvanica,* deposited there. Specimens in the herbarium were almost entirely natives of Romania, and so it was possible to gain valuable insight into the country's flora. Interestingly, we saw no double-flowered hepaticas, though we had half expected we would. Neither had our contact ever heard of the existence of double-flowered forms.

Before arriving in Romania, we both had the misconception that we would see woodlands thick with sheets of hepaticas and hellebores. This turned out not to be the case, and we were ever more surprised by the conditions under which the plants actually grew.



leaves of *Hepatica transsilvanica*, at Brasov, Mt. Timpa

The first hepatica site we visited was at Talmaciu by the River Sadu. Here the banks rose approximately 30 meters, on a rather steep gradient, making access awkward. Vegetation only amounted to scrub, mainly of *Alnus glutinosa, Prunus spinosa, Carpinus betulis,* and *Corylus maxima. Hepatica nobilis* was only to be seen as fairly isolated specimens, seldom more than five plants together. There was little variation to be found in the flowers, but some plants had retained the previous year's leaves whereas others close by were completely deciduous. Nearly all plants we saw grew amongst eroded tree roots in fairly gritty, alkaline soil. Substantial competition for nutrients and moisture came from *Poa* spp. and *Fragaria vesca.*

Several other sites for *Hepatica nobilis* and *Helleborus purpurescens* were disappointing because the plants were not yet visible. One of the most stunning of these was at Cisnadoara. Getting to the site involved a long climb through patchy woodland to approximately 900 m elevation. In the more open, exposed areas growing close to each other were *Bruckenthalia spiculifolia, Vaccinium vitis-idaea,* and *V. myrtillus.*

Much lower down at 400 m, Rasinari, another site, was altogether different. Here plant growth was comparatively advanced. The river valley was very open, with only occasional birches providing cover. One side had been planted in part with pines, under which nothing grew. The *Hepatica nobilis* we found here grew only in soil-filled crevices of rocky outcrops. But this was the most memorable site of the expedition for hellebores. We weren't expecting to see any, but as our eyes adjusted to the subtleties of the habitat, substantial numbers of them were revealed along a gully carved by a mountain stream as it headed for the river. We were amazed to see *Helleborus purpurescens* growing on saturated grassy ledges, and very few far from the water.

Upon closer examination, the colony as a whole displayed a substantial amount of variation. Most commonly, the outsides of flowers were some combination of pink and

purple, nearly always overlaid with varying degrees of gray bloom. In a few plants a richer red-purple was seen. The insides of petals were paler, varying from mauve through lime-greens to yellow. In only one plant did the color of the insides of the petals match that of the outside.

Nectaries were more constant through the colony, being mostly green. A few were lime-green or pale yellow. One of the most beautiful combinations we saw in a single plant was a flower yellow on the inside, zoned around the edge with pinkish-purple, and, best of all, with glowing yellow nectaries. The outside of the flower was equally fine, the yellow coloring having been picked out as a fine ribbon edge to the petals which again were pinkish-purple. This combination was stunning.

Most surprising of all in this population, petals varied from rounded to pointed and were sometimes crinkled or undulating, while the overall shape of the flowers varied from open, rather like a shallow bowl, to cup-shaped. Many interesting individuals were to be found. Furthermore, a few specimens showed a small area of deep-colored netting against a paler background on the inside of the petals. Leaf shapes within this colony were also diverse, with some forms having five simple, ovate leaf segments, others so divided as to be reminiscent of the leaves of *Helleborus multifidus*.

The city of Deva lies within the region of Hunedoara and was as far west as we traveled. This is the most westerly station of *Hepatica transsilvanica* and of special interest since *Hepatica nobilis* also grows in the vicinity. We were told at the Deva Natural History Museum that the two species indeed met here to produce their hybrid, *Hepatica* x *media*.

We arrived after a long and not so enjoyable drive and made towards a huge, dome-shaped hill rising up behind the Museum. At the summit, presiding over the city, was a large ruined fortress. The area was heavily wooded with beech (*Fagus sylvatica*) and oak (*Quercus petraea*), hazel (*Corylus maxima*) and dogwoods (*Cornus mas*), forming the understory scrub. Turning a corner, we were struck by a carpet of varying shades of purple that turned out to be *Corydalis solida*. There was a surprising amount of slate blue in the flowers. This was not the first time we encountered plants whose flower color was best described as *Penstemon* 'Sour Grapes', a dull purple with hints of gray.

Further on we walked up the adjoining valley towards the site where all three hepatica taxa had once been seen in a woodland. To our dismay, the trees had been felled and the land plowed up for cultivation. We did find a stony hillside containing a large population of *Pulsatilla vulgaris*. Deva could only be considered a disappointment for hepaticas, although we were about to be amply consoled.

Walking back around the hill towards the car, we began to see a myriad of *Corydalis cava*, invisible earlier due to sun shining across the slopes, obscuring any vision of what grew there. A delightful variety of forms greeted us. Over the whole area, purple and white forms were fairly evenly mixed, and there were a few intermediates. Also present were individuals with primrose yellow flowers (possibly *C. marshalliana*) and some cream-flowered plants that were especially fine when set off by purple bracteoles. The soil here was deep, leafy, and almost certainly alkaline, judging by exposed bedrock. We also came across a few dense patches of *Isopyrum thalictroides* amongst the

corydalis. Plants of *Hepatica nobilis* were typically sparse and isolated, even more so than at Talmacui. The color of the flowers, however, was rather better, and we saw some excellent deep blues with nice, rounded, overlapping petals.

Poplaca Wood, an oak woodland on the outskirts of Sibiu, was one of the smallest populations of hellebores we visited but ranked as one of the more interesting. We were told that we would find *Helleborus purpurescens* here.

My attention was quickly distracted from hellebores towards some superb *Erythronium* Ninety-nine percent of these were no more attractive here than those in Bradu Wood, but one or two demanded a second look. On one plant, the leaves were almost totally deep, velvety, red-brown with glorious, luminescent, pale green spotting. Close inspection of several flowers revealed another plant in which the central yellow disk was instead the deepest violet. A further bonus with this lovely find was that the outer surface of the petals, which were unreflexed, bore a central streak radiating from a concentration of the same violet coloring around the base of the flower.

When we finally found them, the hellebores were not in nearly as large a colony as at Rasinari. Even so, they were interesting. We were again surprised to find plants growing next to each other totally different in flower shape and color. On all plants making up the colony, nectaries were green. Overall, the outside of the flowers tended to be the typical pinkish-purple of the Rasinari colony, although one plant was a fine solid mauve. Principally, the inner flower color was green, though there were varying gradations towards yellow and pinkish-purple. I was pleased to again come across mats of *Asarum europaeum* identical to those we had seen in Bradu Wood.

Disappointed at Deva, we decided to head back east to Brasov, determined to find *Hepatica transsilvanica*. A telephone call confirmed that spring had arrived there, too, and that plants were flowering. We were heading for Mount Timpa. There were times when I wondered whether we would ever get there, particularly when another tire collapsed. But we did arrive, and we zigzagged our way up the slippery limestone paths through woodland of oak, beech, and sycamore. We had to climb some distance before we saw, partly concealed by fallen leaves, large patches of *Hepatica transsilvanica*, some as much as a meter across. They were a welcome sight. Many had begun to flower. My first concern was to examine the variation in leaf shape. Only one clump was pointed out as being Karpati's *H. t.* forma *obtusata*. No other plants in the immediate area showed leaves of a similar shape. No two plants in the population were identical. Interestingly, we noted a distinct purple color on the leaf reverses on some clumps while on others close by the color was green. Another surprise was that in all cases the foliage was in prime condition, possibly because it had been protected by snow. The most pleasing aspect of the colony was that many of the flowers were an intense dark blue surpassing that of any *Hepatica nobilis* forms we had seen, either in Romania or in cultivation in the United Kingdom.

Hellebores, conversely, were not only scarce here, but rather drab. There was less variation, with most plants resembling the poorer forms of Poplaca Wood. The exciting find was the only all-green-flowered *Helleborus purpurescens* we saw in Romania.

Our last day we washed all soil

from the roots of collected plants and carefully packed them for the journey home. The woodlands south of Ploesti that two weeks earlier displayed no sign of life now had been transformed by a carpet of green. *Anemone nemorosa* and *A. ranunculoides* were the predominant plants. I spent an hour in fruitless search for hybrids. There were also huge numbers of *Scilla bifolia* and occassional plants of *Gagea pusilla*. Farther on from Romanestu towards Saftica, the green carpet was even more interesting. *Corydalis cava* and *C. solida* in combination with *Scilla bifolia* smothered almost every square meter of ground not taken up by trees. Although sour purple forms dominated, some white-flowered forms were also present. Particularly beautiful and similarly scarce were deep, rich wine-colored flowers. For some reason, neither of these colors were nearly as advanced as the purples. With such a diverse colony I expected to see intermediates, and indeed we found a lovely lilac-flowered form of *Corydalis solida*, as well as a white *C. cava* with a suffusion of bluish-purple on the floral tube.

It seemed logical that in an area so saturated with tens of thousands of *Scilla bifolia*, one or two oddities would turn up. I was delighted to find a pinkish-white-flowered form, a delight not diminished when I was later told of the existence of other such forms in cultivation. Another curious find was an altogether sturdier plant than the norm, with 15-20 flowers per scape rather than the more usual 1-6.

Overall, our expedition fell short of achieving all our high hopes, partly due to adverse travel conditions. However, it must be said that we learned a great deal about the native habitats and plant communities of hepaticas. The *Hepatica nobilis* populations we saw would all have been referable to forma *nobilis*, and were all basically similar, although the Deva colony produced nicer forms than the Talmaio or Rasinari. Our contact person did not know the wherabouts of forma *rotundata* or forma *multiloba*. It seems reasonable to conclude until further work that these names were applied to solitary individuals and not to populations of plants of a similar appearance. Although the *Flora* mentioned forma *rosa* and forma *alba*, we did not find them.

To draw any solid conclusion from a single colony of *Hepatica transylvanica* would be premature. The great variablity in leaf shape in this population, with only one plant identifiable as *H. transsilvanica* f. *obtusata* tempts me to think that this name is the result of excessive splitting.

Despite these slight disappointments, the trip was more than worthwhile. We were also able to bring back divisions of many fine plants that will now be propagated and eventually made available to horticulture. After two weeks of travel we are left with many unresolved questions. We hope to visit the Rodna Alps and the lowlands south of the Carpathians in the near future. We wish to thank the Royal Horticultural Society, the Merlin Trust, and the NCCPG Devon Group for their financial support, without which this venture would not have been possible. Our thanks go also to all those who were so generous with encouragement, advice, and time.

Drawings by Rebecca Day-Skowron

Matt Bishop is

Choosing Lewisias

by Edith Dusek

With all that has been written about lewisias, I am astonished by how little has been said about the plant itself. People seem to be most interested in the flower's color, with no regard for plant form or even flower form. When a plant has the potential to live for decades, as lewisias do, it would seem only natural to give some attention to these features.

I have grown lewisias by the thousands, mostly from seed. For better or worse, the following opinions are based on my own observations. What appeals to me might not appeal to everyone else, but after growing so many I have developed my own criteria for judging these plants.

Seed from my own plants, which I plant FRESH, generally results in many babies. Too often seed from other sources germinates poorly or not at all. When faced with conditions under which my own strain of *Lewisia cotyledon* thrives, plants from other sources often prove so puny or finicky that they are not worth the time and effort to coddle them. Mine are descendants of generations that have survived the decidedly trying conditions in my garden. For years my lewisias had to grow in the open garden on raised flat surfaces in little more than road gravel. A couple of particularly fine old stagers were planted as infants in a crease in an enormous granite boulder. For soil they had a few thimblefuls of windblown detritus and decayed moss. In the decades that followed, with no care from me, they have managed to make two rocks out of the one. They bloom heavily every year, never get any bigger, remaining a single crown each. But I digress.

My first rule in selecting the few from the many is freedom from rot. I have no interest in any lewisias overly sensitive to damp—although I will confess to a brief sigh over the passing of a particularly charming, variegated youngster. If the blasted things are going to rot, I would as soon they did it early in life. Any size or age plants that fall prey to rot are treated equably; they are destroyed. Many could be re-rooted with little effort, but why struggle only to lose again later? I am not interested in them—nor in their children.

It has been my experience that rooted cuttings even from well-behaved

plants, even when seemingly well-established are more subject to rot than plants grown from seed. Just because cuttings are not a guaranteed route to fame and fortune with lewisias does not suggest, however, that I never grow them that way. I do, because that is the only way to duplicate a given plant.

It is one of those unfortunate/fortunate things that lewisias do not come true from seed. I always hope that each batch of young ones will produce that extra special plant. Each year I console myself that the general quality of my plants is improving. At the same time, it is an inescapable fact that few meet my admittedly high standards.

It would be nice if the quality of a mature rosette could be predicted in infancy. Alas, it is not so. Just as a pretty child may fail to live up to expectations, so may what appears to be an ugly duckling sometimes prove to be a swan. It may be the exception when what you see is what you get. More often a given plant will go through a succession of stages as unpredictable as those of the teenagers in your family. One must wait out sometimes discouraging displays before the individual settles down to its mature form. Maybe that is part of the fascination.

How big should a single rosette be? Doubtless that depends on the taste of the grower, but sheer size isn't much of a recommendation. I have seen big plants that had all the appeal of the fat ladies of Renaissance art. At maturity, mine vary from the size of an old-fashioned silver dollar to ones that make a 6" pot look small. I have a soft spot in my heart for the little fellows, even if some aren't particularly generous with their flowers.

Rather than being simply huge, my ideal plant has to have ample foliage. I do not care for excessively narrow leaves on what are often referred to as *cotyledon* hybrids; to me they epitomize that expressive word: squinny. Nor am I enamored of those that stick their leaves straight up like a startled jackass—or let them sag like a snoozing beast.

At the other end of the scale is what I call elegance. Even if the plant's leaves are wide, it may still be something of a Plain Jane. Then there are the plants whose leaves are so broad that they deserve to be called queenly. Just a few of these regal plants in a collection serve to set off a bevy of their sisters, leaves decked out with elegantly ruffled and crimped edges, as if for a dress ball. If the margins have a dainty trim of pale green to white, or pink to wine, they can truly be something to behold, even without a single blossom in sight.

Most lewisias of the *cotyledon* persuasion produce a stiff leaf with a

waxy coating to protect against the harshest rays of the sun. Moreover, they have a robust, succulent texture which further helps in times of stress. But some of the most beautiful rosettes have been short-changed in both wax and texture, so they need a bit of midday shading when the temperatures shoot above 90°. For a show that will last year-round and give pleasure for an untold number of years, that little extra attention to detail is not too much to ask.

Lewisias have their own ideas about how many rosettes per plant are the right number. My preference is one. Many rosettes means much moisture trapped between the crowns. Long ago I lost interest in turning my bottom up to the rain just to wipe the necks of my plants. There is small joy to be had from poking a finger in between crowded rosettes to remove the gluey, slimy, smelly remains of old leaves after rains. Failure to pay attention to this chore is very apt to result in the demise of yet another plant.

Plants that produce numerous rosettes may be disinterested in embellishments like flowers. Quite often they bloom scantily or not at all. Yet under my roof overhang grows an enormous old plant with umpteen huge crowns. It produces a bushel or so of flowers, of good color and reasonably good form, even blooming twice a year. Among its assets is staying power; most of the plants of its generation have long since turned to compost. There was a time when I dutifully tended to the needs of this giant, thinning it and making cuttings to allow for good air circulation around the stems. But as far as I am concerned, it has the overall appeal of a Mama's Little Darling having a tantrum.

The leaves of most *Lewisia cotyledon* forms are a medium to dark green. As with everything else, there are exceptions. Plants with white flowers are frequently light enough in foliage to be selected out of a seedling batch even before they bloom. The leaves of some plants are so shiny they look as if the maid (me!) just had a go at them with the polishing cloth; others have a bloom rather like a plum. Some show definite red or purple tones. Some have an attractive color contrast between the upper and under sides of the leaves. These are displayed to advantage on plants with ruffled leaves.

There is one more idiosyncrasy worth mentioning. In any group of seedlings, there seems to be an occasional plant as prone to sunburn as my Irish cousins. While sun damage is always unsightly, it can also be fatal. I have no explanation for the failing; I simply eliminate the plants that burn.

When flowers appear, plants are seen to vary in the number of flower stems, flowers per stem, and blooming period. Some plants are so enchanted with their own show that it is impossible to see the rosettes for the flowers. After such a display, the plant may need a whole year to recover or may even die.

Good flower color is nice, but if the petals are so narrow you can throw a kitten between them, the plant needs to have a lot of other good traits going for it before I will hang onto it. A bushel of flowers will never make up for poor form or color of the individual flowers. A less prolific plant may also produce a second show almost on the heels of the first, or later in the season. Other plants bloom over a considerable period of time. Seed production seemingly does not strain the plants, unless they bloom very profusely and all at once.

Some people concentrate on very long flower stems. To my way of

thinking, extra length is a debit. The flower stem should be in proportion to the rosette that bears it. I reject plants with weak stems that flop.

One does not have to grow many lewisias from seed to discover the twin tendencies of striped petals and rapidly fading color in the blossoms. Flowers that open a lovely yellow can turn a disappointing straw within the space of a day. Too often striping is a negative trait, too. In flowers without striping I have managed to get some very nice blossoms that open apricot or orange and change to a lovely pink. Another color break has orange stripes rather than the usual red tones. On soft apricot backgrounds, the result is pleasing. Strains of lewisias with flowers of rather intense colors have appeared; unfortunately, seldom do they seem to be coupled with plants whose form has much to recommend it. A beautiful flower of good form and color on a superlative rosette is something to aim for.

Most commonly *Lewisia cotyledon* flowers have 8-10 petals, but that may vary from plant to plant or even between flowers on a given plant. Generally the first flowers are the largest and the best formed. Or the first flower may be small and incomplete. After years of growing untold thousands, some flowers are now showing up with extra petals. To me that means a total of 12 or more—preferably more. Only one fully double-flowered plant has appeared. The first several flowers produced are red pompons, while the later ones have fewer and fewer petals, until the last to open on the stem may be single. Not everyone's dream, perhaps, but I am delighted that these single flowers have provided me with a few seeds. It is yet too soon to say whether the seed will germinate, or if the ensuing plants will have double flowers. Equally promising is the fact that the plant has a fine form.

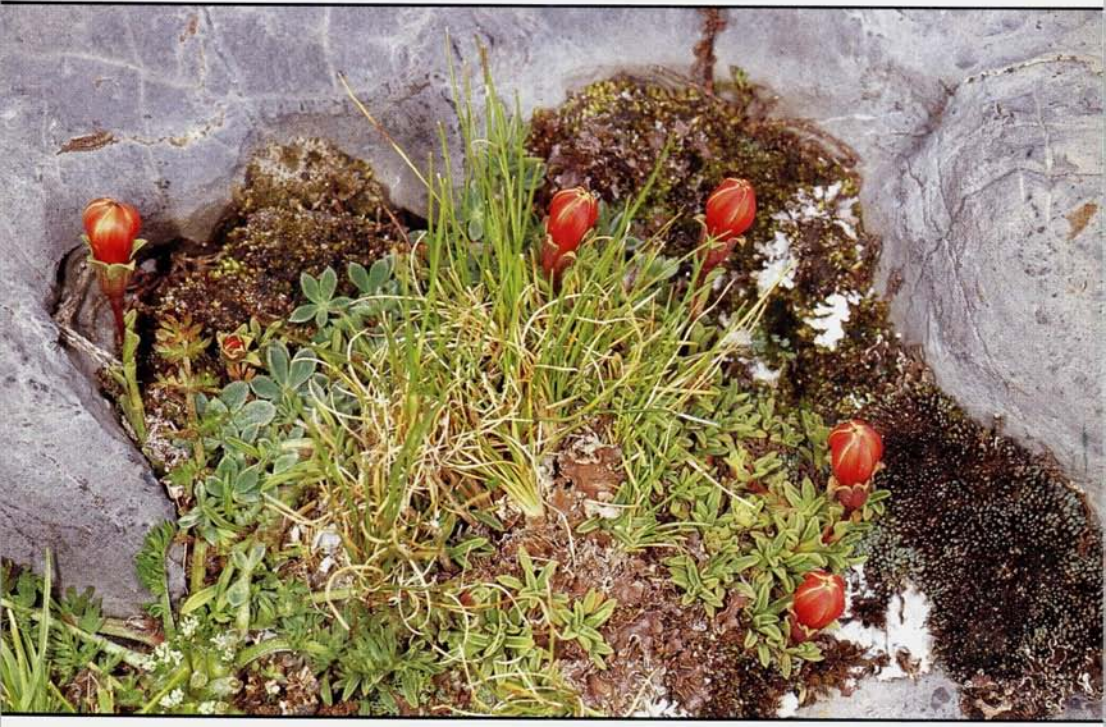
Since age (mine) has cut into my gardening drastically, most of my plants are now grown in pots on an open deck. There they receive the attentions of all manner of insects, and even hummingbirds. That has resulted in some hanky-panky between various forms of *Lewisia cotyledon, L. columbianum* ssp. *columbianum* 'Album', and others of the evergreen species with small, compact rosettes. Flower and rosette size depend on who was mama and who was papa (which plant received and which contributed the pollen). Thus far all seem sterile, often not even producing stamens, although a pistil is present. With endless opportunities for further crossing, there has been no sign of seed. The best of them have charming little rosettes in assorted variety. Most of the rosettes are single. Now and then they produce tightly bunched rosettes somewhat on the order of the named form 'Edithae'.

Do all of my chosen few lewisias live up to the admittedly rigorous set of standards I have set for them? Of course not. If they did, my interest would be centered on another challenge. In closing, it is my opinion that a lewisia with a superb rosette is worth growing even if it never flowers, for it pays its rent year round. Too often one sees lewisias with sorry excuses for rosettes that give a poor return for their garden space. Even at best the flowers last only a little while, so why put so much emphasis on them?

Edith Dusek gardens near Graham, Washington on a shoulder of Mt. Rainer. She has grown Lewisia cotyledon commercially for years and marketed them through Bijou Alpine and Water Gardens. Her gardening has spanned 50 years and at one time included seven acres.

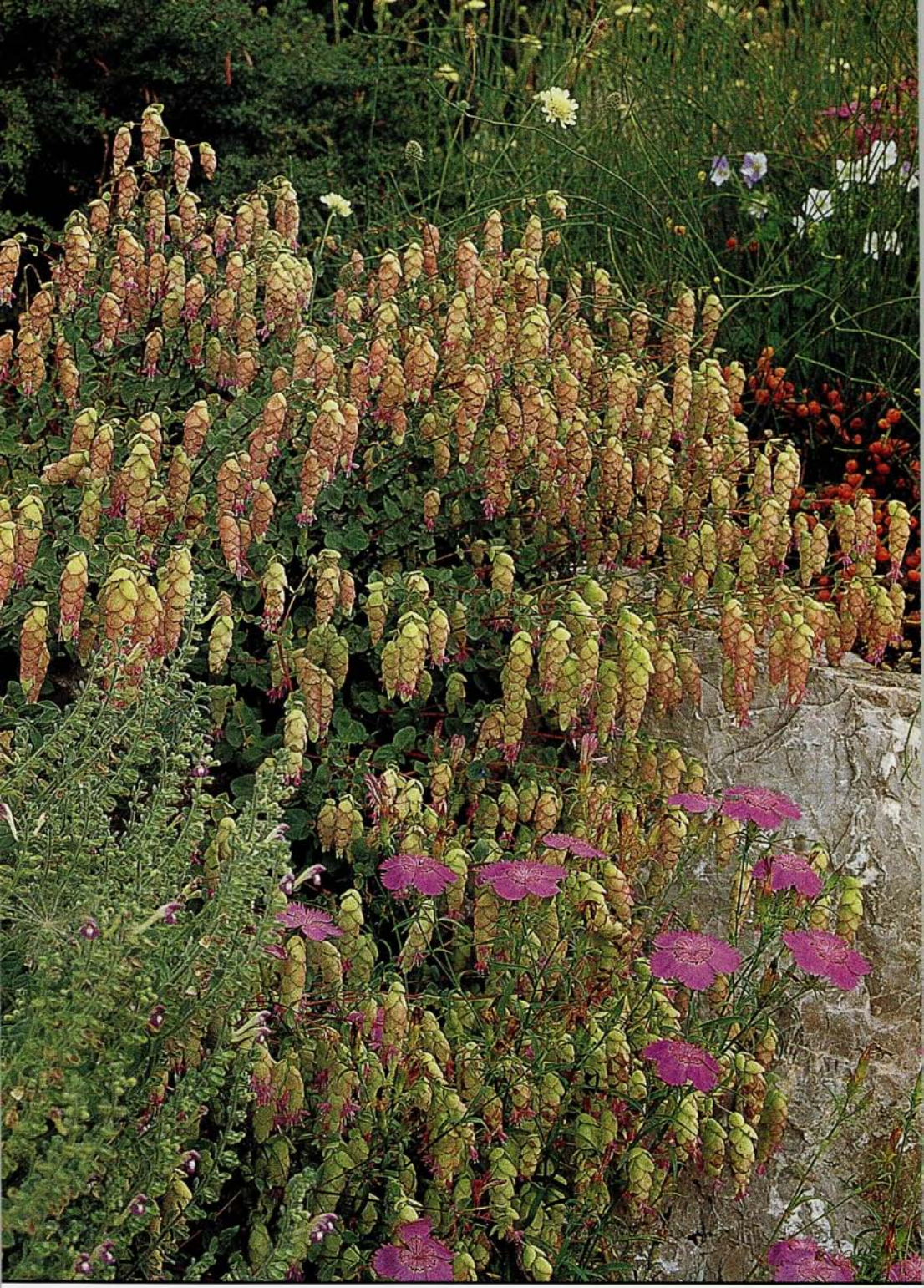
Gentianella hirculus (p. 36) Ned Lowry

Gentianella saxicola (p. 36)



Origanum scabrum (p. 7)

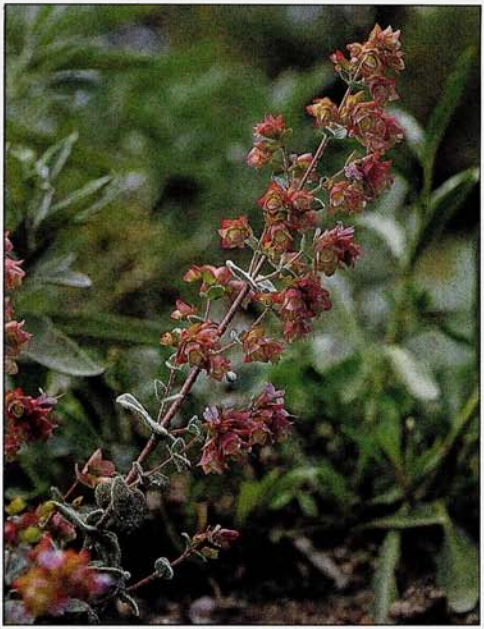
Origanum rotundifolium (p. 5) Panayoti Kelaidis



Paul Martin

Origanum libanoticum (p. 6)

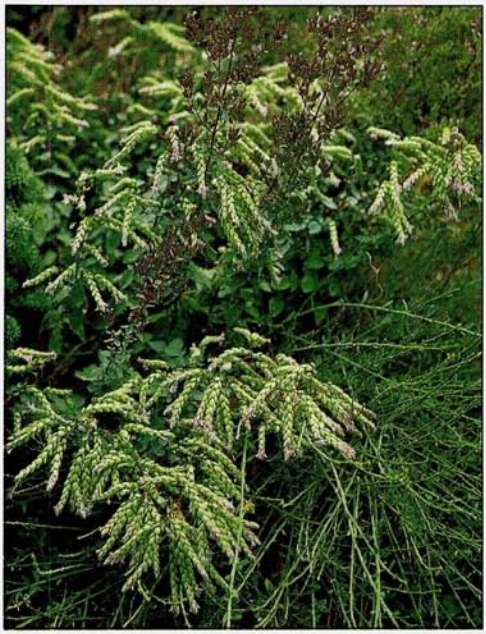
Origanum amanum (p. 7)



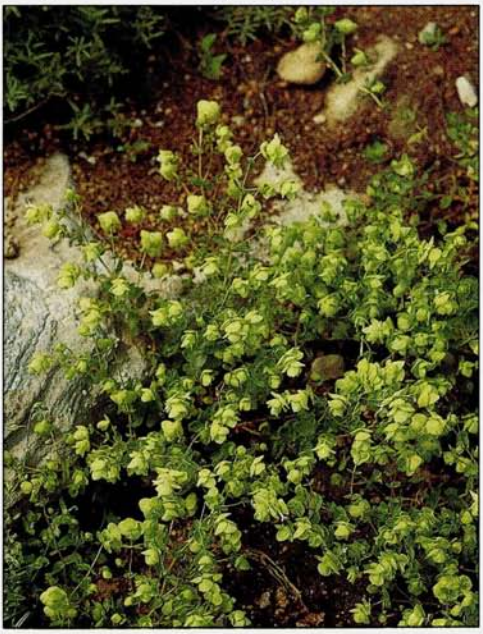
Origanum calcaratum (pp. 4, 5)

Panayoti Kelaidis

Origanum laevigatum (p. 6)



Origanum acutidens (p. 5)



Plant Portrait

Santa's Helper

We had an early, deep snowfall in the fall of 1992, and I thought it might mean good cover all winter. But it rained, and the snow melted down. Just before Christmas, I was out and about the yard sowing newly arrived seed, when a little bit of brilliant blue caught my eye, stopping me in my tracks. I turned to look closer, and there it was, a little gentian in flower and, on closer inspection, with several more buds on the way.

Seed originally labelled *Gentiana newberryi* had produced just this one seedling, and I had left it in the large seed box where it germinated. I had placed an A-frame of old storm windows over the box, as it also contained plants of *Androsace vandellii*, which likes drier overwinter conditions than our climate generally provides. When the little gentian first bloomed the following spring, the flowers looked suspiciously like *G. verna*, a rather odd color of blue, but I didn't know what *G. newberryi* was supposed to look like. I chalked up the appearance to this being the plant's first effort at bloom. That autumn it again bore a couple of flowers, with the same effect, but stopped blooming when cold weather arrived. Meanwhile, the little stems were elongating over the soil and rooting down.

When this gentian bloomed in spring of 1992, it still looked like *Gentiana verna*, and the color was still odd at best. Closer attention to detail revealed a winged calyx identical to that of *G. verna* var. *angulosa*. That did give me pause, since the flowers were certainly only a sickly version of *G. verna* var. *angulosa*. In autumn, the flowers were a better, deeper blue, but half the size. I had expected flowering to stop when cold weather arrived, so I paid little further attention. It was quite a surprise to find the plant blooming happily now at the very end of December, with a color as vivid as any *Gentiana acaulis*, brilliant as if crystalline, set off by that trademark pure white eye of the *verna* group. The size of the flower was still small, but who could complain at seeing any version of gentian-blue at Yuletide? What explanation for this improbable gentian? The color is wrong—but then Rudolf's nose was equally unexpected, and equally welcome!

—Wayne Kittredge

Errata

#@!☆@#☆!!!!

Volume 51(4) p. 269. The date of the founding of the Leyden Botanic Garden was erroneously given. The correct year was 1577.

Books

Nature's Champion: B. W. Wells, Tar Heel Ecologist, by James R. Troyer. 1993. University of North Carolina Press: Chapel Hill, NC. 243 pp., 12 black & white photographs. 5.5" x 9.5". $24.95 hardbound. ISBN 0-8078-2081-4

I only met B. W. Wells once when he attended a reception being held for green graduate students like myself in the Botany Department at North Carolina State University in Raleigh, North Carolina. That was in the 1960s, and by then Professor Wells had been retired as Chairman of the Botany Department for more than a decade. Reading James R. Troyer's biography of the Tar Heel State's eco-pioneer makes me realize that I am the poorer for not having been Wells' acquaintance in the ensuing years, even though we lived in the same county.

In North Carolina, Bertram Whittier Wells is best known for his book *The Natural Gardens of North Carolina,* published in 1932 in cooperation with the Garden Club of North Carolina. It was the first book to describe the state's landscape, its ecosystems, plant communities, and its wildflowers, including discussions of Wells' beloved—and now regrettably gone—Big Savannah wetland in Pender County. The book was the vanguard of popular ecology in North Carolina, particularly of the coastal plain.

The biography, *Nature's Champion: B.W. Wells, Tar Heel Ecologist* , is an account of the indefatigable enthusiasm and energy that Wells possessed as a teacher in the classroom and as an avid lecturer to garden clubs and civic groups, as well as his long retirement to a secluded area called Rock Cliff Farm overlooking the Neuse River in Wake County, North Carolina. The biography is written in an unhurried, relaxed style that Professor Troyer chose in thematically chronicling Wells' life, which spanned 94 years. Included are the controversial and often strong opinions that Professor Wells held, such as his theory on the origin of the oval-shaped Carolina Bays in the coastal plain of North Carolina.

The publication of this biography prompted me to visit the old Wells farm recently to see the autumn flora. Paths have recently been constructed by friends and associates of Wells and by members of the B. W. Wells Association, which supports the site as a Nature Interpretive Center for the state parks system. Wells' favorite plant was the fire pink, *Silene virginica,* and a small cluster now sits sentinel-like at the gate to the yard of the now-abandoned house. The biography has also prompted me to pull from my shelf and re-read portions of his *Natural Gardens.* The two books make fine complements.

—Bobby J. Ward

Propagation

Musings on a Shared Obsession: Growing from Seed

An individual's first attempts at seed germination are usually based on the latest received wisdom. But only experimentation with media and methods can lead to increased success. Further refinements are based on the gardener's own style and level of energy, and the number of preparations, procedures, precautions expands or contracts accordingly. Good germination vindicates the latest method, which then becomes THE method, to be passed along as wisdom, beginning a whole new cycle.

My own early trials began when I received the monumental and incomprehensible ARGS Seed List—with no notion of the Harkness *Seedlist Handbook* to guide me. I sent for the very few items that seemed familiar. Results were disastrous. But the Seed List continued to arrive annually, so I began to solicit advice (always abundant). The pitifully few successes were enough to keep me going, though I've no idea why. The breakthrough in results came serendipitously from another chapter member's recipe for seed medium: equal parts of Pro-Mix and chicken grit. Attracted by its simplicity, I tried it. Germination improved immediately and steadily increased in subsequent years.

My procedures for seed-sowing mirror my general laziness and are decidedly *laissez-faire*. I admire those who make meticulous preparations, take infinite care and copious notes, but I cannot call up the energy to imitate them. The medium, as noted, is pared to two ingredients. I wet the mixture in advance, allowing about 24 hours for the peat base to completely absorb the water. If truly moved, and not too busy, I have even prepared pots (unwashed) of the mix, ready in trays. Labels are completed in advance, as I find that chore pleasant, easily done in odd moments. Once seeds are sown, labelled, and mulched with grit, the pots are given a last watering—lately with hot water—and kept indoors another day. I sow in January and February; by March I am bored with the whole process. The seed pots are placed outdoors, left to the elements and Nature's own devices. My only concession to aftercare has been to erect a screen guard over the trays in an attempt to keep heavy rains from washing the seeds from their pots. Spring rains, in general, absolve me of the need for further watering.

Over ten years of lackadaisical fiddling, germination has slowly improved, as expected. Occasionally, there are sudden germinations, after years of unsuccessful attempts, using exactly the same methods. I continue to hope for these minor miracles. By general reckoning, my level of 60-70% germination during the first year is acceptable, so I shall probably remain in this mode for the time being.

Now on to the next stage: growing all these seedlings into mature garden plants. Surely there's a simpler way of doing it...

Joyce Fingerut

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American Rock Garden Society
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The 1994 ANNUAL MEETING

Appalachian Spring

Great Smokies Hilton, Asheville, North Carolina
May 6, 7, 8, 1994

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