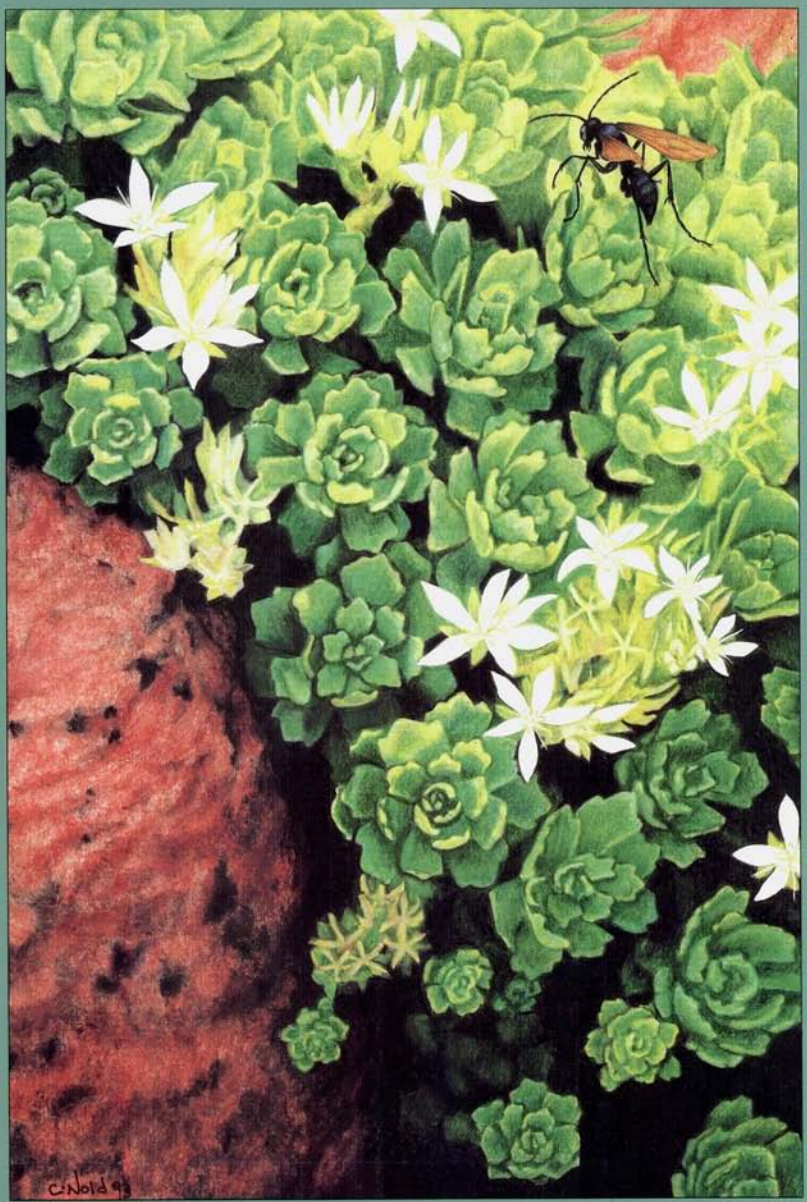
Bulletin of the

American Rock Garden Society



Volume 52 Number 3 Summer 1994

Cover: *Sedum pachyclados* with Spider Wasp of the family Pomilidae

by Cindy Nelson-Nold of Lakewood, Colorado

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Features

Departments

Daphne arbuscula

On the Track of *Daphne arbuscula*

by Joan Means

When they heard of our plans to join a botanic group visiting the Czech and Slovak Republics during the summer of 1993, our friends had two questions: "Are you sure you'll be safe?" and "Will you buy me one of those yellow spring gentians that the Czechs grow so well?"

But Czechoslovakia was not Bosnia or even Miami. Although the country divided its name and territory only six months before our visit, it was an amicable divorce. Yes, sometimes we crossed the border between these two small Central European nations several times in a single day, and each time we had to show our passports to fuzzy-cheeked guards who wore armbands because their uniforms hadn't yet arrived. And, no, we couldn't buy *Gentiana verna* var. *oschtenica*. We didn't visit any nurseries, and we didn't even visit rock gardens, except one owned by an abashed forest ranger—though in several cottage gardens we did see *Trillium grandiflorum* growing under apricot trees just a few feet away from carrots and leeks, not to mention *Papaver somniferum*, universally grown to provide poppy seed for delicious rolls and pastries.

Our trip was upcountry, to the rural parts of these countries that few foreigners have visited. Farmland was punctuated by small villages, their houses surrounded by gardens containing everything from Alberta spruce to chickens, their streets decorated with red floribunda roses—and by loudspeakers on poles. These originally relayed government announcements, but apparently they've been kept so that residents without Walkmans can enjoy music while they work. Usually we stayed in small towns with well-stocked state supermarkets, private shops with rather bare shelves, old churches, beer halls, and medieval buildings in the process of restoration. We could easily have spent our time sightseeing, but we'd joined a group from the New England Wildflower Society in hopes of seeing *Daphne arbuscula* in the wild. And we did find that enchanting miniature shrub—but not until we'd seen a great many other wonderful plants.

Happily, we were in the hands of E-Tours, a Czech firm which is carving out a niche in special-interest tours—bird-watching, farm practices, wine production, etc. For nearly three

weeks, starting in late June of 1993, we crisscrossed the Carpathian Mountains, and everywhere we were joined by local botanists and conservationists ready to help us identify the plants we were seeing. This was important, because it was too late in the year to locate many familiar alpines by their flowers. Still, other small plants of great interest were in bloom, and they weren't all on the tops of tall peaks. Indeed, because most of our group was interested in ferns and orchids, we had the pleasure of exploring places most rock gardeners might have bypassed: fields where pink and cream scabiosas bloomed along with thyme and teucrium; magnificent beech forests carpeted with *Soldanella* and *Hepatica*; limestone cliffs studded with campanulas and, yes, *Daphne arbuscula*.

To fully appreciate our experience, you must meet the tour's cast of characters:

Paul—our American leader, is a lecturer on wildflowers who told E-Tours he was bringing his "botany students" to study the flora. Naturally the Czechs expected a group of young adults, so you can imagine the consternation felt by

Borek—a 27-year-old Czech with a degree in forestry, who served as the E-Tours agent and as our interpreter. Though urbane and charming, he clearly was surprised when he first saw...

The 16 Students—most of us well past retirement age. At least two were clearly along just for the ride, one recovering from a hip operation, and another an octogenarian unable to walk without a cane. (Give us an hour for shopping in a little town, though, and these two would beat the rest of us to the stores.) As for young Borek, he spent his evenings switching our reservations from youth hostels to more "appropriate" quarters and persuading botanists that, no, our group really couldn't manage eight-hour treks over the peaks of the High Tatras. His right-hand man was...

Frank—champion bus driver of the Czech Republic (I couldn't possibly make this up). Because he was practicing for the international competition to be held in Finland in August, Frank tended to put the pedal to the metal on the straights, but he could wheel his big bus over precipitous, rutted lumber roads where I would have opted for a Jeep. Despite a penchant for flirting with pretty girls and breaking into folk songs, this 30-something native Slovak was a mother hen, constantly worrying about our comfort and welfare. When, on the second full day of the trip, my interest in orchids had been so dampened by a downpour that I returned to the bus, Frank took one look at my soggy jeans and said, "You take off." I'm past the age that excites general male interest, but, not knowing him well, I declined, although he made his intentions clearer by offering me a dry pair of his own sweat pants.

Finally, there was the bus—large for our small group, washed daily by Frank, it was equipped with a small refrigerator to keep bottles of the magnificent local beer and the execrable local soft drinks cold. It did not, however, have a toilet. "Why can't you use nature, as we do?" asked young Borek. Beech forests are markedly deficient in underbrush, so we campaigned for less exposed facilities. No doubt Borek will tell his grandchildren about the day he escorted a dozen American ladies to a public loo

because, having failed to get us to a bank during the unpredictable working hours, he was the only one with coins in the right currency.

Natural functions aside, pollution is a major problem in both countries. To keep rural populations employed, the communists scattered factories everywhere—even tiny towns had at least one high-rise block of apartments for workers. As a result, most rivers are full of industrial chemicals, not to mention sewage. In short, they are where the USA was 30 years ago. Still, we were struck by environmental efforts that don't require large capital outlays. Forests are selectively cut or clear cut only in very narrow bands; landfills are promptly capped with a layer of earth; even when they have tractors, farmers use horse-drawn machinery and hand labor to reduce erosion on steep slopes. Most impressive, as land is returned to private ownership, and it becomes clear that the heirs don't want to farm, small conservation groups are buying up tracts to save them from development. Many of the glorious meadows and woodlands we visited, especially in the Czech Republic, were in the hands of these miniature nature conservancies.

As mountains go, most of the Carpathians are small potatoes, just low, wooded hills, which east of the Danube sweep in a great half-moon from Hungary to Poland to the Ukraine. Composed of limestone that in some places has been carved by streams into spectacular caves, gorges, and pinnacles—usually crowned by the ruin of a castle—they boast a flora that seems to owe as much to centuries of farming and timbering as to geographical location. Indeed, the open fields looked like herbaceous borders, and, where they are conservation land, they are carefully cut by scythe to preserve late-ripening seed. I especially remember, in damp meadows, red and pink orchids (*Dactylorhiza majalis* and *Platanthera chlorantha*) mixed with spikes of *Gladiolus imbricatus*, underplanted by the leaves of *Colchicum autumnale* and *Primula veris.* Drier fields were colorful with tall, purple salvias and yellow verbascums, the pink cluster-heads of *Dianthus carthusianum*, and cream *Scabiosa ochroleuca*, among too many others to mention. Nearly every open place boasted a trio of ubiquitous campanulas: lavender *C. persicifolia*, purple *C. glomerata*, and mauve *C. patula.* Less well known, the third is a short-lived charmer with up-facing bells. Shadier spots at the edge of woodlands were rich with yellow and purple aconites, *Campanula trachelium*, the attractive white buttercups of *Ranunculus plantanifolius* (longer stemmed than its cousin, *R. aconitifolius*), *Lilium martagon* (we saw only one white one), and 10'-tall spikes of *Delphinium elatum* (Foerster cultivars are available in Germany). The white plumes of *Aruncus sylvester* filled the narrow cuts made by selective timbering. Even the forest floors were gardens: there were ferns, of course, but also *Paris quadrifolia* (a trillium relative), *Asarum europeum* growing mixed with *Hepatica nobilis* and lily-of-the-valley, *Convallaria majalis.*

Confusingly, the small plants treasured by rock gardeners often showed up among border plants. *Adonis vernalis* and the alpine thistle, *Carlina acaulis*, nestled among tall campanulas in dry meadows; encrusted saxifrages covered limy outcrops only inches from the tall spires of *Digitalis grandiflora*; and a mat of 6" stems bearing racemes of spectacular purple bells—a campanula we weren't able to identify—grew in a hay field.

After the gardenesque comfort of the western Carpathians, the brutally glaciated granite peaks of Slovakia's High Tatras came as a shock. We had traveled along the highly industrialized Vah River to the city of Poprad, where chemical plants belched fumes over a high plain. And there in the distance, thrusting into the sky as abruptly as the Grand Tetons, was a small cluster of rugged peaks: at 8,500', much taller than we ever imagined, yet occupying not much more territory than the island of Manhattan. The High Tatras is a national park and also an enormously popular tourist and ski resort—both the Czech Republic and Slovakia are incredible vacation bargains for most Europeans.

We frittered away most of a morning on still another *Dactylorhiza* beside the road, but finally, about noon, a few of us started up a trail with several thousand tourists and the park botanist, Dr. Rudolf Soltes, a burly man who is an eminent expert on lichens. We hadn't even entered the woods before we saw one of the outstanding plants of our trip: *Campanula tatrae*, a bellflower in the *rotundifolia* complex (photo, p. 223). This one makes a neat clump and has sumptuous purple bells hanging in profusion on sturdy, 6" stems; apparently, it is not in general cultivation—but should be. The trail rose through the forest—we nearly stumbled over a *Soldanella carpatica* nestled among the rocks—and wound into a stand of mugho pines, where the purple-spotted yellow flowers of 18"-tall *Gentiana punctata* were magnificent. Eventually, the path emerged on a gentle alpine meadow of turf and willows. Beyond, the path to a hanging valley and lake was blocked by a cliff that had been draped with what looked like a cargo net. Anyone wishing to climb up had to pay a fee to a park functionary.

By then, only Borek was with us. "Joan, I don't think you should go farther," he said. I didn't think so either, so we contented ourselves with the plants at hand. *Campanula alpina* caught our attention immediately (photo, p. 222). Huddled against boulders out of the wind, it had furry little leaves and 4" stems carrying several large, purple bells, The last few gold-bossed, white cups of *Pulsatilla alpina* nodded in the wind; glistening white daisies of *Chrysanthemum* (*Leucanthemopsis*) *alpinum* hugged the ground; and along the brook tumbling from the hanging lake, mats of the rather succulent leaves of *Arabis alpina* were topped by long-stemmed white flowers.

Paul was afraid of ski lifts, so six of us interested in alpine plants left the group the next day to ride a chair to just below the snow line. There was another fee for those wishing to hike the trail to a lake, but we were happy enough crawling over a steep slope of turf and scree, as Borek and Frank watched over us like sheep dogs from the lift terminus. With the added altitude, we found pulsatillas newly opened, along with the glistening white, multi-flowered inflorescences of *Anemone narcissiflora* (photo, p. 222). A patch of *Silene acaulis* mingled with a handsome plant new to me, *Pedicularis verticillata*, with typical ferny foliage and, on stems only a few inches high, heavy little spikes of brilliant pink flowers (photo, p. 223). A very different, classic alpine was far less conspicuous. We'd been kneeling on it, and its mossy matrix, for an hour before we realized that the dime-sized rosettes of shiny, little, notched leaves were those of *Primula minima*. The big pink flowers had been replaced by capsules, but the slope must have been spectacular with them a month earlier.

Still, for biodiversity, nothing beats limestone. As it turned out, the largest

array of alpine plants we saw grew well below treeline, southwest of the High Tatras on a 4,000'-high plateau peppered with sink-holes and ice caves. The Muranska Planina is part of a large "protected landscape," similar to our national forests, established in 1977 and taking in about 5,000 square miles. It is administered by only ten employees compared to 2,000 in the High Tatra National Park. This is the wildest part of the two republics, the last place where wolves, bears, lynxes, and wild boars still roam. It was empty of people. Once away from the few farms and villages, we saw only a couple of woodcutters—indeed, to pass down several of the lumber roads, we first had to unlock wooden gates.

We stayed in the rather impoverished town of Revuka, in a hotel which only two weeks earlier had been sold by the State to private owners. We were their first guests. In fact, the hotel wasn't really open yet, and they were still cleaning the wall-to-wall carpets by scrubbing them with soap and water in the parking lot. Needless to say, the carpets didn't fit very well when they were nailed back down. No matter, our hosts couldn't have worked harder to make our stay pleasant. After the first morning, they bought an espresso machine especially to satisfy the American demand for breakfast coffee, and one evening a gypsy musician accompanied our hilarious attempts—under Frank's enthusiastic guidance—to dance polkas and the csardas.

Our daytime guide was Dr. Peter Turis, the young chief botanist for the Muranska, and right away he took us to where the main road (beautifully asphalted) rises to cut through a limestone formation. The white fringed pinks of *Dianthus hungaricus* splayed from the rock; a colony of *Primula auricula* had seeded into the crevices. In a glade in the woods across the road, near a stand of golden *Trollius altissimus*, another limestone outcropping was covered with moss in which colonies of the delicate, pale blue harebell, *Campanula cochlearifolia*, grew next to *Pinguicula vulgaris*, a moisture-lover more often seen in bogs. Farther along the main road, where a hair-pin turn sliced through heavy clay banks, the gorgeous pink pincushions of *Scabiosa lucida* waved on foot-high stems next to compact clumps of *Campanula carpatica*. The latter had rather congested foliage and huge lavender saucers on short stems and looked close to the form called *"turbinata."*

The next day, Frank inched the bus up a precipitous lumber road and parked it in an open meadow fragrant with thyme. From there, the able-bodied walked up a trail lined with *Pinguicula* and *Moneses uniflora*, the round leaves of *Soldanella hungarica* (slightly larger than *S. carpatica*, which we'd seen growing in the acid Tatras) carpeting the adjacent deciduous forest floor. After crossing a field studded with newly planted conifers, we ducked under some larch branches and crawled (at least I, with no head for heights, did!) out to the edge of a cliff. And there they were: 8"-high shrubs with narrow evergreen leaves and with every accessible seed head covered with a little white bag. Dr. Turis is conducting research on *Daphne arbuscula*, trying to discover why it is so rare in the wild. The daphne, as are many of the other alpines growing on the Muranska below treeline, is a relict of the Ice Age, but it is also an endemic and indeed, according to Dr. Turis, is fairly well restricted to this particular cliff. Sometimes it is listed as coming from Hungary, but that in itself is a political

relict dating to the end of the First World War, when Czechoslovakia was created in part from Hungarian territory. Now, of course, the daphne must be listed as Slovakian.

Whatever its nationality, *Daphne arbuscula* is a marvelous rock garden plant with clusters of tubular lavender-pink flowers appearing in May and often again in the fall. It doesn't seem to set seed in cultivation, but it is certainly hardy at least into USDA Zone 4 and is easy to grow. Lime doesn't appear to be a requisite. Certainly most of the bushes we saw were rooted directly into the cliff, but some also seemed to be growing in the layer of humus overlying the limestone. This was acid enough to support mountain cranberry, *Vaccinium vitis-idaea*, although lime-loving *Primula auricula* and *Gentiana clusii*, a trumpet gentian in the *acaulis* group, grew there as well. As the King of Siam said in the musical comedy, "It's a puzzlement."

Curious to see what was going on in his domain hundreds of feet below, Dr. Turis disappeared over the edge of the cliff while the rest of us ambled back to the bus. Frank had borrowed cups from the hotel and had rigged an immersion heater to make coffee, complete with fresh cream from the bus refrigerator. Sitting on the thyme, we strained particles of coffee beans through our teeth (in these parts, "Turkish" coffee is made by pouring hot water over regular grind) and passed around Frank's pictures of his wife and two children. Eventually, Dr. Turis came bounding up the trail to report that soldanellas were still blooming, in mid-July, in the gorge, where patches of snow and ice were still melting. Somehow, I wasn't surprised. In this charmingly enigmatic part of the world where revolutions are velvet and even the Communists tried to preserve the land, why shouldn't down be as good as up, or alpine plants grow happily in the woods?

Along with an acre of garden in Georgetown, Massachussetts, Joan Means shares with her husband, Bob, an interest in searching for great plants in their natural settings. Joan reports that for the first time this spring *Boykinia jamesii* bloomed in her garden. Nine cherry-red flowers appeared on a single flowering stem of the Pikes Peak form, and Joan is thrilled!

Drawing by Rebecca Day-Skowron

Calochortus

Sensational Native American Tulips

by Claude A. Barr

In the western half of our continent dwells a brilliant and versatile race of spring bulbs that are known and enjoyed but little outside their natural area. *Calochortus,* comprising the mariposa tulips and related groups popularly known as fairy lanterns or globe tulips and cat's ears or star tulips, are the instant delight and envy of every flower lover who sees them, whether as specimen groups in the garden or in nature's lavish landscapes, where fifty thousands hold their shining cups stiffly erect to the sun and the breeze on a quarter-mile slope.

The mariposas gain their devotees through many lines of appeal. The typical form of the flower is of matchless grace. Three very broadly obovate petals with recurved tips form an ample bowl or a deeper chalice with a broad rim; three like-colored sepals that alternate between the bases of the petals. Low upon the inside of each petal is a splotch of strikingly contrasting hue called the gland. It may be flat or deeply pouched, is often surrounded by decorative tufts of bright hairs, and usually forms the axis of a fanciful and intricate pattern which the early Spanish adventurers in California aptly saw as the wing-eye of a mariposa—butterfly, in our tongue. This "eye," this scintillant peacock feather motif, seems the reason for being of the flower's tri-part structure, peculiar grace and exquisite modeling.

The rich effect is enhanced by texture and color in the ground of the often bearded segments: pure, dazzling, fine-velvet white in *Calochortus catalinae,* melting lilac in *C. macrocarpus,* pinks, grays, citrons, purples and reds in the *C. venustus* varieties, molten gold in *C. clavatus,* and orange-vermilion in *C. kennedyi,* so intense that the delicate pile of its velvet gives reflections of pale lavender in certain lights. There are perhaps half a hundred species and nearly as many more varieties and color forms, all widely set apart in appearance from the forms and species of Old World tulips.

Slight acquaintance does not compass the wonder of these flowers. But, believing, one demands, "Why are not these rare beauties in all our gardens?"

Ah, there! Though more than a hundred years have gone since David Douglas gathered the first of them for

eager English experimenters and though 50 years or more some or many of the species have been on the market, still they remain the playthings of a few lucky or extremely clever gardeners who somehow meet their exacting requirements. Just what these are a steadily augmenting coterie of admirers is striving to know.

The usual final failure under the best available advice and care and their usual advent from California are the basis of the familiar assumption that these most desirable of all natives are not hardy. The generalization goes very wide of the mark. Those which have their origin in California include tender kinds from the southern coast that bear practically no frost to others that withstand fairly low temperatures, even light freezing during early growth if the all-important factors of soil and moisture are right.

In addition a few high-mountain sorts are quite hardy and—a fact not commonly dwelt upon—some twenty species are native outside the mild coast state or but touch its colored borders. While a few of these are Mexican, others, chiefly in the showy class and including some of the most outstanding and distinguished in form and beauty, are to be met with from northeastern California far into the intermountain dry belt of British Columbia and across Washington and Oregon, Idaho, Montana and Wyoming, two species extending onto the plains of the Dakotas and northwestern Nebraska and following the cold ranges of the Rockies far to the south.

In the difficult environment of my garden on the South Dakota plains the superhardy species have proven their true worth. Here a basically heavy soil, often a shortage of moisture in the growing time, occasional deep wetting in the dormant, and rapidly fluctuating and extreme temperatures have provided a natural laboratory for observing various limits of adaptability. Yet here has been met an encouraging success in growing nearly all the kinds available commercially in recent years and a number of rare ones sent me by friends.

My first effort, with a mixed lot of the vaunted gaudy Californians, was as fruitless as anyone may expect who plants them wholly without understanding. There followed a splendid performance by one of the local kinds, the lovely *C. nuttallii*, brought in from a gravelly ridge a mile or so from my home. This gave new courage and prepared me for the next step, the possession of Carl Purdy's wonderful catalog, which described species and forms in bewildering variety and gave explicit cultural directions.

Bulbs for a good-sized planting were purchased and put into the ground in October, the soil of the garden being lightened by the addition of sand and gravel to a depth of six inches. Taking on faith an impression as to hardiness, no protection was given. But as the good Deity looks after fools and children, the winter was mild, with light snowfall, and frost did not strike deeper than six inches. Spring brought no superabundance of wet, thus furthering the absorbing adventure, and a dozen kinds, Californians and others, gave thrilling bloom. The record notes that two or three kinds did not bloom at all, possibly from too little moisture, that *C. plummerae* and *C. catalinae*, too tender, had renounced earthly cares, and that an occasional bulb was missing from others. *Calochortus catalinae* and *C. plummerae*, procured a second time, have since performed faithfully, year after year, given full protection from cold.

So began an extensive series of experiments, testing many types of soil, varying the planting depth,

improving subdrainage, increasing or lessening shade, seeking the right moisture for the growing period. One year severe cold came. All the Californians had been given their then-accustomed blanket of 12" of hay at the first serious onslaught of winter—all, that year, but a test lot of the redoubtable *C. vestae,* one of the finest of mariposas, perhaps the most adaptable of all, and one of the hardier of the Californians. The cold wave held for a month. A drop to 40°F belowcame one night, and the unprotected lots had only an inch or so of snow cover. *Calochortus vestae* failed utterly, and I noted with surprise and shock, in April, the vacant spot where my only bulbs of the rare and costly "pink shades" had been ventured. From that I quite lost interest in cold tests, and so I do not know, exactly, how much some of the Coast Range bulbs will bear.

Circumstantially, side by side with *C. vestae* through that fatal trial stood *C. macrocarpus, C. lyallii, C. apiculatus, C. gunnisonii, C. nuttallii* from southwestern Colorado, and other cold-climate kinds, and 40°F below impressed them not at all. They came through to a bulb.

The following data are now clearly determined: outside the growing season, early March to mid-July, here, the soil may be as dry as ground can become in this dustbowl climate, even for the Californians accustomed to their winter rains; a dry dormant bulb is a safe one. There has been no opportunity in many years to observe the effect of a continuously wet summer and fall, but occasional soaking rains are not fatal when soil texture and drainage provide quick dissipation of the excess. Planting may be done as late before winter sets in as convenient. Four inches to the base of the bulb is a good depth; deeper planting is of no advantage except for extra-large bulbs. They grow well at two and a half inches apart but make a good show spaced four inches. Bulbs that have remained so dry that they have merely swelled their root nodes and made a start of tip growth by early March bloom freely if they receive moisture at that time or as soon as the ground is frost free.

Within the month shoots of the most precocious will appear, red-nosed and hardy, but from the first activity of the tips beneath the soil until blossom buds are in evidence is a touchy time and moderate moisture is the safe rule. For the less hardy kinds it is well to have lath frames, burlap pads, perhaps hay, at hand until frosts are surely past. They want plenty of water from the appearance of the buds until just before flowering time; then, preferably drought. The new bulb which grows annually within the old, crowding the flower stalk into a curved position against the old husk, is fully developed at flowering time and matures without further supply of moisture. At this time or with little delay a thorough drying out serves perfect ripening. In a congenial environment the bulbs continue for many years.

Just here a criticism of accepted beliefs is due. Alternate freezing and thawing during early growth is credited with being enemy number one of *Calochortus.* Granted that repeated freezing is injurious, the careful observations of years are 1) that frost injury, even killing back to the ground, may be only an accessory act and that when fatality occurs, a clinging, smothering moisture does the dirty work after the freezing of a heavy, soggy wet soil; meanwhile calochortus bulbs are entirely immune in this same soil if on the dry side. 2) That the semi-hardy ones really do not differ in their essential reaction, as I have had them

resume growth after sudden cold—in this garden a late March blizzard has forced the mercury to zero—had taken the first few inches of leaf, when the soil warmed quickly and moisture was not excessive. And 3) that the bulbs perish in wet ground in an apparently identical manner without Jack Frost's coming on the scene.

But ahead of suggestions for garden handling let us pause to look into the private lives of the mariposa bulbs. In the West's great open places, with a few exceptions, they forgather, worshipping an ardent sun, selecting their particular abodes with a knowing eye to a sloping surface and a subsoil that is fully capable of carrying downward and away any unbearable surplus of water taken into the earth. More often than not they grow in regions of low, irregular rainfall and active and dessicating winds. Further, the prairie soils which are acceptable to them, the adobe soils, or sandy deserts and sagebrush plains, and the stony mountainsides where a pick is required to extricate the bulbs contain little humus, and this leanness also aids drying.

With these habitat characters in mind the gardener will seek a moderately light medium such as will be readily warmed by the sun and avoid richness. A lean soil like the subsoil from an excavation or a cut bank will return to relative dryness while rich soils are still reeking wet. Some fineness of texture at least in contact with the bulb seems their preference and conducive to good coats. Clay, acceptable to such as *C. eurycarpus, C. nuttallii, C. vestae, C. venustus, C. purpurascens* in their native climates for its greater storage capacity, in a wet climate may become a clinging death through that same property, that and its natural coldness that holds back growth when growth must be surging upwards. Clay, leafmold, and humus increase moisture capacity, do they not? Avoid them, along with all that tends to defeat dryness. One must not fear to provide starvation rations, for an astonishingly little fat-of-the-land will nourish a mariposa's beauty.

A medium of the desired qualities may be compounded of one-third very fine clean sand, one-third fine limestone chips, and one-third lean loam. Alternates are coarser sand, any fine-screened gravel, any convenient earth that has not been enriched. It may be necessary to employ a portion of subsoil. If a heavy loam must be used the measure may be reduced by half or to just enough to fill in not too completely between any sand grains.

In early planting, one species showed unmistakable dissatisfaction with drainage facilities or growing medium or both. That most brilliant of them all, *C. kennedyi*, darling of the desert gods of Ojai, the Panamints and Death Valley, freely sacrificed herself to demonstrate the family hatred of stagnant wet. The least affected of the plants came blind, that is, withheld their blossoms; others suffered the usual sickening and withering of the foliage, and the bulbs, still firm, were hastily rescued and dried; some, damp too long, were full of a mushy decay when examined.

Desperate, I vowed to build a suitable desert for *C. kennedyi*. And little as I knew of real deserts, I happened to do the right thing. Well out in the open a place was selected, away from the close air and fitful reflected heat of walls and with practically a full day of sun. An excavation of 20" exposed an absorbent shale which, it seemed, would take care of subdrainage. Twelve inches of coarse gravel were tamped in, an inch of fine gravel to support the soil layer, three inches of sand with just a slight admixture of loam. At this depth, four inches, the

bulbs were placed, covered with the samesoil, and the balance of the hole filled with almost pure sand. Abracadabra! And a winter of suspense—doubt—and condemnation.

The greater wonder and excitement, then, as *C. kennedyi* came forth to greet the spring in all her native queenly splendor, and as thus, responsively, recurrently, she serves her foreign bondage.

But as the treatment seemed unduly harsh, a similar planting was made, another year, with the difference of a little more and "better" soil. The result? No drama here. The *C. kennedyi* lives but has never flowered. And the leaf growth is narrower, more channeled, lacking most of the frosty bloom and white margin that mark luxuriant well-being in this species.

In the desert type of planting, which doubtless will aid in growing many mariposas where other efforts have fallen short, the gravel layer acting as a catch basin is not intended to remain a reservoir; an outlet must be assured. Thus moisture depletion is permanently provided for, and capillary moisture is cut off from below, a further vital advantage. The gravel may be shallower if the escape is good. Some coarser gravel may be added to the recommended sand-limestone chip-lean loam mix, up to the level of the base of the bulbs, augmenting drainage and simulating a common natural footing. For most species a 4" rooting layer is preferred as many kinds are stronger growing.

Means of surface drainage are the usual ones of raising the beds and tilting the surface. As in the wild, grasses and other vegetation compete with the tulips for available moisture. Shrubs that form networks of shallow roots may be made use of where they will not cast shade. Whether low annuals that will survive without watering are to be used to dress the beds after the bulb season is a matter for consideration. Mulches or cover, as such, over the dormant bulbs are best not used except when the ground is dry or at freezing temperature.

Digging and storing the bulbs over summer, sometimes effective where that season brings much rain, doubtless may be obviated by the adjustment of soil and drainage. When summering in the ground results in failure, predisposing factors have with certainty been at work prior to the dormant time. Digging gives the grower opportunity to note the condition of his bulbs, and if they are anything less than perfect, he will do well to remodel his program. On the other hand if the set-up has produced thrifty growth and good flowering, full-sized replacement bulbs and crisp and clean ripening, with fair probability they will summer in the ground.

An unhappy phase of *Calochortus* culture in the form of a disease also involves moisture. It is popularly called lily leaf rot, botrytis, or mildew. The critical period is just before flowering. If at that time cloudy, damp weather comes, infected plants will darken and wither at the leaf tips, and as the trouble advances, buds droop and flower parts and portions of the stem may be destroyed. The blight is sometimes detected at an earlier stage in distorted leaf tip growth, noted in lateral curling, browning and stunting. Hot sun and dry air halt the destruction at any stage. The infection is often present in wild stands of the plants, appearing with wet weather and having no more final effect than to ruin a crop of blossoms. The bulbs are not directly destroyed. Scientific knowledge, as far as I can learn, is lacking, and at present no one can prescribe. The answer may lie in Clorox treatment or in hormones. Fortunately

some species and certain strains of others seem immune. In my garden, Old World tulips grown in close proximity have not contracted the trouble.

Among very hardy kinds *C. apiculatus, C. macrocarpus, C. greenei, C. gunnisonii, C. eurycarpus,* and *C. nitidus* are best ventures for the beginner, while *C. venustus* var. *purpurascens, C. venustus* var. *citrinus,* and *C. vestae,* of the Californians are very adaptable and fairly hardy. Mr. Purdy recommends *C. venustus* var. *citrinus, C. venustus oculatus, C. vestae, C. nitidus, C. eurycarpus, C. lyallii,* and *C. apiculatus* as practically immune to the leaf rot.

The fairy lanterns and cat's ear tulips are less exacting than the major branch, liking some shade and leafmold, and where the mariposas can be accommodated, these groups will be found more uniformly hardy and amiable. Each variety has its own distinct character, charming in degree, and when one has come to know them, to look for the silken glow of the lanterns or to expect the half-mischievous and ever watching "eyes" of some of the cat's ears, an absence would be noted sadly.

If a prophecy may be entertained, the calochorti of the future are destined to prolong the glory of spring bulb bloom. They will follow close upon the receding wave of the Darwin tulips and surge on into July, and surely we may look forward to the day when first one, and finally numbers, will be brought under the transforming influences of hybridization and selection and made amenable to general garden use. Now and again nature takes a hand at adapting her offspring to meet new and different conditions, and in any lot of bulbs may appear one that survives and prospers while its fellows perish. Such a marked individual is to be treasured as a pearl of great price by the gardener whose understanding eye detects it, and the utmost thought and effort given its preservation and increase. This is the primary commission to those who grow *Calochortus.* For in strange climates and in strange soils may new adaptive characters best be observed and tested, and doubtless there also will this aloof and many-starred race be wholly fitted to stand alongside present favorites.

Claude Barr lived on a ranch in South Dakota. He was the pioneer horticulturist for the Plains and Rocky Mountain regions, the original xeriscaper, and one of the greatest early voices of the North American Rock Garden Society. His *Jewels of the Plains* is a classic of horticultural literature.

This article was found (with the help of Prof. Ronald Weedon, Director of the Chadron State College Herbarium) in the Claude Barr archives in Chadron, Nebraska. Written in 1939, it was accompanied by a folder containing a decade of notes and correspondence on growing *Calochortus.* The last entry in the folder was a 1940 rejection by *Flower and Garden.* This was early in Barr's writing career, and it appears that Barr was devastated by the rebuff, and in any case, he put the manuscript and the folder aside forever.

—Tom Stuart

[Carl Purdy was a plant collector of note who sold many wild-dug bulbs of *Calochortus* in the 1930s. He died in 1945. Current sources of *Calochortus* include Robinett Bulb Farm, PO Box 1306, Sebastopol, CA 95473. There is now an American Calochortus Society. Write: ACS, 260 Alden Road, Hayward, CA 94541. —Ed.]

Harmony with Nature

by Jaroslav Faiferlik

Everyone is part of Nature. We all depend on her, our vital functions, including mental ones, yielding to her laws. There is an instinct in us that lets us sense and emotionally live through Nature's various scenes and stages. We find an inner harmony and healing for our souls in her.

Country scenery has its *genius loci*, the spirit of each place, which impresses and excites our emotions—whether in a joyful, beautiful, sad, or unpleasant way. The impact of a particular landscape depends on the sensibilities and mood of the individual.

We look to Nature for ways to put ourselves at ease again in the world after the hustle and bustle of human trade and interaction. This could perhaps be gained by arranging our gardens in a natural style. Having dreamed of a desirable garden scene, we try to obtain the best flowers and natural materials to in order to bring it in to being. Some plants, for example, require the company of rocks or pebbles, while others prefer decaying wood, and so on.

If we really want to cooperate with Nature, we should take advantage of local ecological conditions. Of course, we *can* change the final face of the landscape—artificially—but where there is a desert, we often find ourselves modelless in ridding ourselves of that bleak scenery, in completely converting it to something else. And how hard it would be not to plant riverine growth next to a rich supply of water! True cooperation between Nature and the gardener suggests that we refrain from inventing artificial vegetation inconsistent with the original conditions of natural reality.

By respecting the original composition of the ground and choosing the right plants and other natural elements, the desired psychological effect may be acheived. The larger the garden, the more variety we may grant it. An undulating landscape with clumps of trees and shrubs offers us a great chance to add a variety of habitats. Then each small area just waits for us to arrange it well and finally be rewarded by a wonderful magic of light and shadow.

A garden's shady groves, for example, perfectly complement an inconspicuous footpath. The path brings up mystery likely to strengthen and develop our interest and imagination.

Beyond each visual obstacle appears a surprise hidden in the very next scene. Such a path may astonish us with graceful changes caused by the progression of Nature through the seasons. In such scenes we find the original models of the paintings of the masters, including spring buds tensed with maximum vitality as well as the tranquillity of winter rising through snow and hoarfrost. Thanks to the infinite variability of weather, the continual shifting of day to night, and the alternating beauty of the seasons, the atmosphere of the landscape is at one moment stimulating or at another subdued, always of interest, always new.

Beauty and holiness call to us from the softly undulating grassy ground and from the proud semicircular crowns of trees and shrubs. Connected by the simple "S" pattern curve of a trodden footpath, a creek's meander, or the edge of a planting, the effect of such a landscape is certainly deepened. A feeling of pleasant satisfaction is found in various green hues and light-colored petals. Such harmonious scenery moves our thoughts, most powerfully in the corners of a shadowed, mysterious garden. Where there are dark pines and overhanging woody plants, one might even become a bit nostalgic and sad.

Let's create optimism then! The sunny parts of the landscape planted with tiny and bright plants, as in real wildflower meadows, are the very best places for that! Trembling tiny leaves, sparkling half shadows, the soft movements in the rapids of brooks are joyful as well.

Nobility is another emotion that may be evoked by natural scenes. If there is, however, no view of mountains, of giant trees nor of powerful rivers from our window, one of the quickest ways to evoke a feeling of grandeur is to plant large and staturesque species, such as *Miscanthus, Heracleum, Rheum, Polygonum.* These may succeed in growing to an admirable height in a short time. Flowers with large and colorful petals have a similar effect.

Dreary scenery where the development of plant life is limited troubles the human mind. During hot summer days our gardens may remind us of such landscapes. Similarly, people may find the dead remains of organisms ugly and useless. But Mother Nature values all of these as bearers of picturesque shades. Doesn't this push us to borrow them from her and find a place for them in our gardens? Strongly impressive scenery will be produced in this way. Among these gifts of Nature belong crumbling rocks, the dead trunks of trees, and so on. "The symbol of mortal life," one would add. But actually we are going to express the *cycle* of life in our gardens. As soon as first plant takes root from an old stump, we realize there are no cemeteries in Nature. The decaying tree just carries on with another task—the one parents go through.

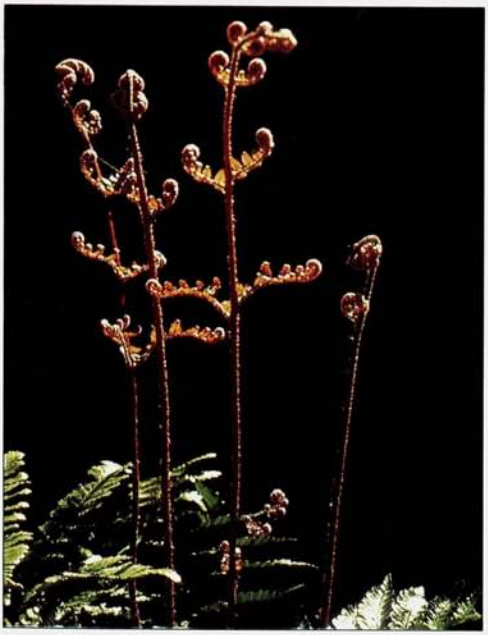
Thoughts, born of Nature's spirit, have constantly led us to the gate of optimism. We should never forget that this is a mission of our gardens, too. Let's create our favorite scenery, no matter what it actually consists of—rockery, grove, heath. Only we must remember, it is not for cheap decoration that we build, but rather to truly charm, to stimulate sensitivity and happiness by obeying and understanding Nature's effects and laws.

Jaroslav Faiferlik gardens in Plzen, in the Czech Republic, and strives to create his gardens in harmony with Nature, to live through natural activities, and to make the workings of Nature available also to other people.

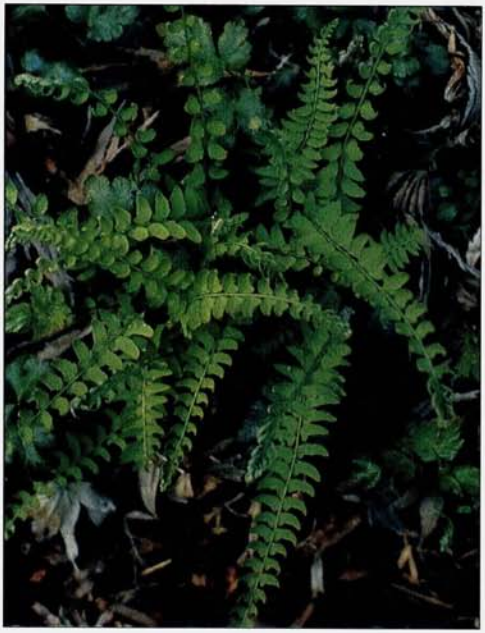
Blechnum penna-marina (p. 183)

photos by Sue Olsen

Dryopteris erythrosora (pp. 182-183)



Woodsia polystichoides (p. 183)



Adiantum venustum (p. 182)

Polystichum polyblepharum (p. 182)

photos by Sue Olsen

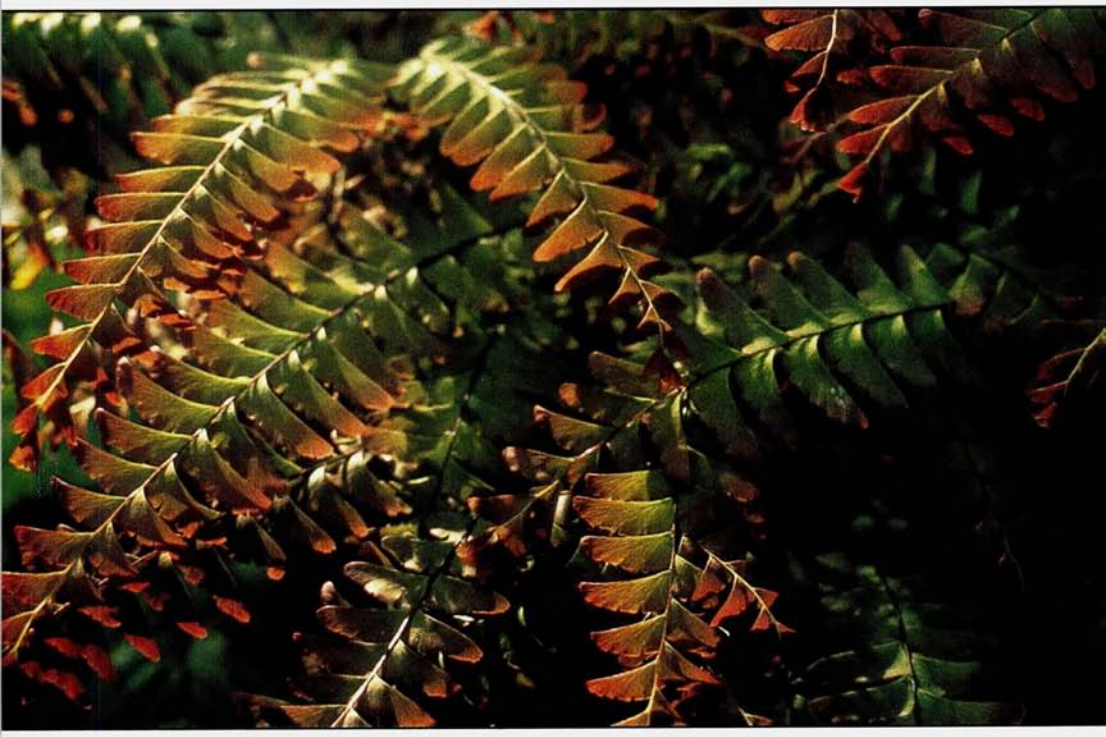
Athyrium niponicum var. *pictum* (pp. 181-2)

Athyrium otophorum (p. 183)

Dryopteris polylepis (p. 184)

Adiantum pedatum 'Japonicum' (p. 183)

Sue Olsen



Pacific Treasures

for the Temperate Fern Garden

by Sue Olsen

The ferns of nature's wonderland were first cultivated for both ornamental and medicinal purposes. Some are still in use as herbal remedies today, especially in the Orient. However, ferns, with their monochromatic hues, are primarily used in the contemporary landscape to give coherence to garden design. Victorian Britain enjoyed its fern craze, but for most of this century the only selections available for the North American gardener/horticulturist were our natives (which were regrettably mostly wild collected, and unfortunately in some cases still are), and several of the select British cultivars and European species. It was not until relatively recently that the abundance of mostly evergreen material native to Pacific Rim countries has been researched, imported and introduced. And what wonderful introductions they are. Colorful *Dryopteris*, creeping blechnums, and an evergreen maidenhair are but a few of the delights now available for cultivation. With today's increasing horticultural exchange with China and more diverse spores arriving from Japan and the Himalayas, the prospect for discovering future treasures is very high.

Not all of these imports are small plants, however. In fact, there's not a rock garden "cushion" in the crowd. But, as I've seen 3'-plus. *Osmunda* is in perfect scale in such places as the rock garden at England's Sizergh Castle, I guess it all depends on your site (and perspective)!

Meanwhile, at least four prize imports in the flowerless category have made their way into mainstream garden design in the '90s. These once rare plants are here presented, admired, and promoted for their beauty and adaptability. They are followed in the text by newcomers that can compete for the gardener's attention and, in time, for priority in the landscape structure. Unless noted, all of the ferns described are hardy and suitable subjects for at least Zones 6-9.

Athyrium niponicum var. *pictum* is the overall best-selling fern in North America today (photo, p. 179). I have been in gardens where (lamentably) it is the only fern in the plant community—the token fern of choice. Commonly known as the Japanese painted fern, its deciduous foliage is indeed painted with gray, blue, and pink-to-burgundy tints in varying

intensity. Normally, this exceptionally hardy variety grows to 15-18" in the garden; however I have been given plants that vary widely from this norm—stately knockouts that approach 3'! There is some speculation that genes of the lady fern, *Athyrium filix-femina*, may be involved with these giants; however, further research is desperately needed before the variations can be defined with scientific accuracy. Meanwhile, it is a beautiful plant that serves well as a tidy ground cover under the burgundy foliage of Japanese maples, or in the company of any shade-loving foliar or floral blues. Over time it has been in the trade as *Athyrium goeringianum* var. *pictum*, and as *Athryium iseanum* var. *pictum*,— neither of which it is. *Athyrium iseanum*, a delicately lacy but untested species, is just now becoming commercially available. *Athyrium iseanum* combines well with *A. niponicum* var. *pictum* or with typical plants of the species *A. niponicum*, which, while less flamboyant, are in themselves worthy plants for subtle color in the sylvan scene.

Color, by definition, is part of the glamour of another cosmopolitan workhorse, the autumn fern, *Dryopteris erythrosora* (photo, p. 177), although in reality the "autumn" color display takes place in April! It is hard to believe that this fern was virtually unheard of in cultivation in the United States 25 years ago. It was the very unavailability of this ornamental that led me to venture into the wonders of propagating from spores...a subsequently addictive activity! Autumn fern is a tall, broad evergreen that furnishes a colorful complement in a bed of epimediums. Both plants prefer dappled, deciduous shade, although when established both perform admirably well in almost full sun. A little kindness by way of shade in the midday helps, however. *Dryopteris erythrosora* var. *prolifica* is a smaller counterpart, again rosy and evergreen, but with a more finely cut profile and propagable bulbils along the frond's midrib. It is openly elegant and distinquished in effect.

Polystichum polyblepharum, the tassel fern, is a lustrous, evergreen staple for any woodsy planting (photo, p. 178). At 18" the shiny foliage gives life and light in shady somber or, for that matter, in the flower vase. It must not be allowed to dry out. It looks especially nice with low-growing, rustic woodland wildflowers...trilliums, hepaticas, violets, but nothing too boisterous.

The fourth in the category of better-known Asian ferns is *Adiantum venustum*, the Himalayan maidenhair (photo, p. 178). This evergreen garden extrovert creeps about in partial shade, giving an airy elegance to any planting, without overwhelming its companions. The pale new growth sprouts surprisingly early in the spring and at 12" is a refreshing understory carpet for heavyweight evergreens, especially rhododendrons, azaleas, and kalmias. Unfortunately, it is most inconsistent as a spore crop, one year producing in quantity, and never progressing beyond the prothallia stage the next. Flooding a spore culture often resolves this problem by encouraging fertilization, but results have been erratic at best.

The following species tend to be less familiar than the above selections, but as they become increasingly available, they should indeed be future standards for fern collections or be used as embellishments in the mixed bed.

Amongst the lower growing species there are several species of *Asplenium—A. incisum*, *A. sarelii*, and *A. tenuicaule*, all of which are delicate and lacy. But unless you have better-mannered slugs than I do, all must be culti-

vated with every precaution available. *Woodsia polystichoides* is a more reliable choice in the dwarf category (photo, p. 177). As the name implies, the fronds hint of *Polystichum* in outline, but unlike *Polystichum,* the foliage is soft and deciduous. I like it in a casual setting with shiny ground covers such as *Coptis, Vancouveria* or *Asarum.* Be sure to note its location so that you don't accidentally plant something on top of it during dormancy—or am I the only one who does this?

Another deciduous beauty is *Adiantum pedatum* 'Japonicum' (*Adiantum japonicum,* in ed., photo, p. 180) Tissue-thin fans of sunset reds radiate from brittle stipes (stems) as the garden comes to life in the spring. In time the color fades to a more traditional green, but the grace of the typical maidenhair silhouette remains beloved and unchanged. This surprisingly sturdy one-footer is an outstanding choice in soft shade at water's edge.

Athyrium otophorum has been on the market for just over a decade and bears uniquely colored fronds of lime and raspberry (photo, p. 179). This 2' species retains its foliage in frost-free winters but can be more wisely handled as a deciduous specimen. The sherbet shades associate harmoniously with dark greens and wine-reds. However, unless you're into screaming combinations (say *Houttuynia* and variegated ajuga), it should be well removed from anything even vaguely blue or yellow.

Phegopteris decursive-pinnata is my final suggestion in the deciduous category. This is a refined ground cover with stiffly erect, apple-green 15" fronds. It is very hardy and adaptable and an excellent cover for maintaining a tidy appearance in neglected areas or to dress up the formal shade border. It will wither with the first frost so should not be used as a focal point in the winter view. While most ferns must be propagated from spores, this species can easily be divided once several crowns have formed—fall is the preferred season.

Two species of *Blechnum* add diversity to the garden design. New Zealand's *Blechnum penna-marina* is a fairly well-known evergreen ground cover that once established will colonize in poor soil and sunshine (photo, p. 177). A sunny exposure is recommended for keeping the planting compact and tidy. New growth is a mixture of holiday reds and greens, which will be maintained throughout the season in a sunny location. *Blechnum niponicum,* by contrast, grows as a single rosette of sterile fronds with a fountain of fertile fronds at its center. Like many species of *Blechnum,* this too has colorful new growth. Unlike many species, however, this is quite cold tolerant. My own spores came from a good friend who rock gardens in Connecticut. Blechnums in general want a lime-free soil and resent pot culture. This latter must be taken into consideration when propagating, or potting for a show. Let them share root space with a fellow plant.

Dryopteris bissetiana and *Dryopteris purpurella,* which may very well be confused in the trade, are offered as alternatives to (or in addition to) *D. erythrosora.* They, too, are evergreen, have autumn colors in their new growth and are reputed to be even hardier than *D. erythrosora.* They are bushy and like shuttlecocks in form and can perform the landscape duties of a small shrub. In their company *Dryopteris decipiens* makes an excellent foreground plant or edging species. The foliage has a satiny, metallic patina that plays delightfully with varying angles and degrees of light. At one foot in height, it is a quiet evergreen partner in the fern composition.

Mickel lists it as Zone 5 in his new book.

Another *Dryopteris, D. championii,* has survived cold winters with class. This Japanese evergreen saves its beauty for maturity. As a youngster it could be any of several attractive species. However, in established plants the 2'-plus fronds unfurl with a dusting of silver and when fully expanded are a rich, dark, velvet green. It is especially handsome as a guardian of white and pastel primroses.

Dryopteris polylepis, introduced to American horticulture by NARGS legend Roy Davidson, stands out in the spring garden by virtue of the crozier's dense cloak of prominent nigrescent scales (photo, p. 180). These are in bold contrast to the warm green tones of the fern's emerging foliage. Plant it under your *Acer shirasawanum* 'Aureum' (formerly *A. japonicum*), where the fern will anchor the color of the tree. In the Zone 8 Pacific Northwest *Dryopteris wallichiana* has long been admired, yet it has been totally unpredictable in cold winters, sometimes surviving Zone 6 weather while at other times expiring in Zone 8 termperatures. Although smaller, *D. polylepis* is clearly the better choice. Treat it with patience, however, as it is both slow-growing and resentful of transplanting.

A trio of polystichums round out this brief portfolio of fern delicacies from Pacific populations. *Polystichum makinoi, P. neolobatum,* and *P. rigens* are all excellent evergreens for general purpose landscaping, specialty fern plantings, and green unity in the colorful bed. All appear to be more cold tolerant and less moisture dependent than the attractive *P. polyblepharum,* which they resemble in shape and gloss. They are rigid, toothy species of medium height that best display their individuality when planted in combination with each other. Or, try combining them with various textures and colors of hostas for a visual feast.

While this is but a sampling of the bounty of recent imports, hopefully it includes a new fern or two for *your* garden. The introductions of the past 25 years have indeed extended the options and increased enthusiasm in the fern world, whether for the collector's appetite, the beginner's woodlands, or the shady rock garden. Enjoy!!!!

For the fern lover, horticulturally adventurous, or the botanical enthusiast, a new non-profit organization, The Hardy Fern Foundation, is working to expand these introductions by testing ferns for hardiness and ornamental value in the Northwest and at numerous satellite gardens throughout the USA. There should, in time, be one near you. Members receive quarterly newsletters with reports and observations on fern culture in North America and throughout the world, have access to a spore exchange and are offered plants as they become available. YOU can help this program and your fern garden as well. For further information send a SASE to The Hardy Fern Foundation, 12921 Ave. DuBois S.W., Tacoma, WA 98498. Thanks and good growing!!

Sue Olsen has been growing ferns for many years in her garden in Bellevue, Washington. She has travelled to China and England studying ferns and has introduced many new species and forms through her specialty nursery Foliage Gardens.

South African Journal

Karroo to the Drakensberg

by Panayoti Kelaidis

Recent years have seen a flood of germplasm from the Andes, Turkey, Central Asia and the Western United States into horticulture. Rock garden journals are filled with pictures of exotic plants from these locales, and more and more plants are showing up from these areas—mostly in pot culture and plant sales. With a few notable exceptions, much of this material appears to be more exacting, and certainly more challenging to grow for long periods of time in the garden than more familiar, traditional European alpines.

I remember reading an article, once, that spoke of plants that "paid rent"—which is to say plants that bloomed for an extraordinarily long period of time, or else plants that had such beautiful foliage throughout the year that they hardly needed to bloom. *Viola cornuta* is an example of a plant that blooms virtually the entire growing season in my climate at least, while *Sempervivum* cultivars in their infinite variety are the classic example of foliage alpines. Year after year I discover that practically any African alpine I acquire fits neatly into one or both of these categories. I began to notice that the African alpines grew very quickly from seed or cuttings, often blooming the first year. They seemed to be unparticular with regard to soil and culture; a large proportion of plants from the southern part of Africa apparently approximate that holy grail of nurserymen—the Ever-Blooming Perennial.

One of the first African plants I ever grew was *Euryops acraeus*, the epitome of silver leaved shrubs. Assuming that such shimmering foliage properly belonged to a dryland plant, I placed the *Euryops* on a rather dry scree, where it proceeded to grow—eventually attaining a foot in height and almost two across. It smothered itself year after year with golden flowers. Marty Jones from 8000' at Vail, Colorado, asked to try a few cuttings once, and I blush as I remember my rather grudgingly agreeing to his having one or two, thinking why send a poor African to certain doom? Of course, this *bona fide* alpine from 10,000' cliffs felt right at home in Vail where it grew more luxuriantly than it ever did in Denver. This exemplifies the cultural versatility of South African plants.

Then there was *Oxalis depressa*, known for so long as *O. inops*. This spread its underground bulbils though many square feet of rock garden before I realized that even the harshest Colorado winter wouldn't faze it. The leaves don't appear until early June, but the cheerful, pink, cup-like blooms on 3" stems last for much of the early summer. Place it where it can spread with wild abandon, and enjoy. So much for the myth of tenderness in Southern Hemisphere plants! Now that a host of bulbs and succulent herbs, including *Anacampseros*, four species of *Lithops* and almost 50 species of Aizoaceae, have come through Colorado winters unscathed, it is apparent that not just high alpine South African plants possess tremendous genetic tolerance to cold. One cannot make pat judgments based on the much warmer isotherms of the Southern Hemisphere.

In the early 1980s I visited Vancouver Island in midsummer. A highlight of that trip was visiting Albert DeMezey's remarkable garden on Foul Bay Road in Victoria. A steep bank carpeted with *Echeveria* spp. next to the house alerted me to how mild Victoria can be in the winter. Peat banks covered with the foliage of *Pleione* were a further sign. But the open, sunny screes were dotted with innumerable plants of *Helichrysum marginatum*—a simply stunning midsummer bloomer. (This has been confused with the woolly leaved *H. milfordiae* with crimson buds that blooms much earlier in the season, but the real *H. marginatum* is a deep blue-green, leathery-leaved plant with a silver stripe on the margins of leaves borne in lax rosettes; the 2"-wide, white strawflowers are displayed on stems 4-8" tall. I have subsequently obtained this plant from several sources and find that it does much better in a peat bed with some shade in Colorado.) Only a few helichrysums are being grown in rock gardens, but like so many plants from the Drakensberg they bloom in our gardens from July onward, making them invaluable for extending bloom in rock gardens. African plants are fulfilling the dream of year around gardening.

Many more helichrysums have joined *H. marginatum* to enliven the summer doldrums with pink, white and yellow. A myriad of other South African daisies—white, purple, and lavender *Osteospermum*, yellow *Gazania*, and black-and-white *Hirpicium*, to name a few—will often bloom for three months on end. Three species of *Diascia* have thus far proved to be hardy, and suddenly there are available more and more species of *Kniphofia* and *Crocosmia*, and the first hardy *Moraea*.

The plant that most quickened our enthusiasm, however, was the mysterious ice plant that had made the circles of rock gardeners for years labelled simply "*Othonna* sp. Basutoland," or "*Mesembryanthemum* sp. Basutoland." I remember accepting three such plants from Bob Putnam in the spring of 1980 with considerable trepidation—surely no ice plant would grow in Colorado. Like so many people who first grew this plant, I was astonished as I watched it spread with such gusto that first summer. I took a few cuttings in the autumn, since surely anything so lush, so green, so vigorous couldn't possibly be hardy. When it turned that remarkable ruby-purple color in the winter, I hardly knew what to make of the plant! But when it cleverly turned back to Irish green with the first warm days the next spring, I was completely charmed by this chameleon of a plant. Each spring since I think I fully recapture the shock and delight I first experienced when for a few weeks this ice

plant completely covers its much-branched stems with such cheerful, inch-wide, shimmering, daisy-like yellow blooms. And to think, at first I didn't even have a clue to what it was. You can imagine how pleased I was when I found out that Bruce Bayer, the leading authority on plants of the South African karroo was to come to Denver and give a lecture. People in the know assured me that no one knew South African succulents better than Bruce. I grew impatient as this wise scholar lingered over every bit of vegetation the quarter mile or so it takes to get down to the Rock Garden from the entrance gate. Upon arriving at our specimen, Bruce proclaimed "A *Delosperma*, of course," and I heaved a sigh of relief—it would be no problem to determine a species once we'd gotten it down to genus. "Don't be so sure," he went on, "The genus has several hundred names, and it's never been properly monographed, and I, for one, have never seen anything like this specimen in the karroo."

Although I have subsequently investigated major American herbaria trying to find out more about *Delosperma* in general and this species in particular, I have never seen a specimen of *Delosperma nubigenum* taken in the wild. And almost 15 years later, I was stunned to find no specimens of this species or its close allies in the Compton Herbarium at Kirstenbosch in Cape Town. John Wurdack, of the US National Herbarium in Washington, DC, took the initiative to write leading workers on the family Mesembryanthaceae, and I will never forget receiving from him copies of the correspondence—three different scholars had given him three different names! *Delosperma nubigenum* seemed to fit our plant the best. What does this plant look like in the wild? Since no one has ever seen a capsule on the cultivated clone, is it self sterile? How does it compare with wild germplasm? These are some of the questions that nagged at me for years and spurred me on in the desire to visit the high mountains to seek out this remarkable mysterious mesemb.

Johannesburg may be the principal administrative capital of South Africa, but Cape Town will always be the point of departure for the botanically inclined. Not only is Kirstenbosch one of the most exquisite public gardens in the world, but the fynbos floristic region, where Cape Town is situated, is generally acknowledged by botanists to be the richest floral domain on earth in terms of plant speciation, relative to its total area. From a distance, in midsummer the mountains of the Cape look rather barren, but from close-up I had to agree with Kuus Roux, an African botanist who felt that fynbos with its proteas, plumy restios, and a welter of shrubby, bulbous, and succulent plants really does resemble a dusty Victorian parlor when viewed at close range. Species density approaches the equatorial rainforests in number and variety. Even though I arrived in early January, after the summer solstice, I was amazed to find ericas, restios, proteas, and numerous bulbs still in full bloom every time I visited a patch of fynbos. It was only toward the end of my trip that I realized that the high mountains both north and east of Cape Town rise to sufficient heights that a great range of fynbos plants might well prove hardy one day in Colorado: after all, we grow a good many alpines from the hills surrounding the Mediterranean Sea from a latitude with climatic parameters closely approximating the higher parts of the Cedarberg and the Swartberg. If this prove true, bar the door, Katy; our gardens will never be the same.

Careening through the Karroo

My first destination for a field trip lay but a hundred and fifty miles from Cape Town, beyond the first few ranges in the heart of the karroo. Karroo is a term used in South Africa to characterize the drier interior portions of the country. Karroo generally has richer soil substrates than the nutrient-poor quartzitic sands one finds in fynbos. Karroo is nearly as species rich as fynbos—and might be compared to the desert/steppe vegetation of central Anatolia or the Iberian peninsula contrasted to the macchie one finds in these same regions, or the karroo-like Great Basin desert or Mojave contrasted with coastal California chaparral.

I had managed to grow quite a number of plants from the karroo and wanted particularly to investigate the escarpment of the Roggeveld mountains near Sutherland in the heart of the Great Karroo, an area renowned in South Africa for its harsh winter climate. I was fortunate to be accompanied by Fiona Powrie, Kirstenbosch horticulturist specializing in *Pelargonium*, who has explored extensively in the mountains of South Africa and has a tremendous grasp of the native vegetation—both as a botanist and horticulturist. There is a stark contrast between the coastal mountains, with their magnificent protea forests, and the lowland karroo, reminiscent at times of madroños on the American Pacific coast, and then again of olive groves in Greece—until one notices the gigantic flowers! But soon we descended to an even sparser scene, with tan soils and even more burned up vegetation, a setting that obviously had not seen rain in many months. When we finally stopped to look around, the variety and density of plants growing on the karroo astonished me: giant *Tylocodon* shrubs with muscular trunks and an almost solid ground cover of herbaceous plants like pelargoniums, dried stalks of who knows how many kinds of bulbs, and tiny crassulas, mesembryanthemums and other succulents intertwined. Time and again I was struck by this dichotomy—a seemingly barren vista transforming to incredibly rich vegetation on close inspection.

Of course, large stretches of the karroo have been terribly overgrazed, reducing species diversity drastically. It is inevitable that agriculture will prosper on these rich soils, and large stretches of karroo vegetation near Worcester have been turned into table grape plantations to satisfy Europe in the winter and spring. Saddest of all were the acres that had been plowed and planted to an exogenous *Atriplex*, which must be thought to produce fodder more efficiently than the native vegetation. Even so, there is still quite a bit of karroo left to enjoy—and I believe that the floral bounty in this region has barely been touched by rock gardeners.

Our base camp in the karroo was the town of Sutherland—renowned in South Africa for its cold winter weather. The vegetation in the town was virtually identical to what one might find in the lower Rio Grande Valley—the little town of Truth-or-Consequences, for instance. I am quite sure that the rainfall and temperature patterns are very close to some of the mountains around El Paso or Roswell. And, of course, plants from these parts of the United States are proving to be quite hardy, so when I saw giant *Agave americana* in Sutherland, or *Eucalyptus* in valleys not far away, I didn't lose heart altogether. Even colder weather must occur in the escarpments 1000' or more above the town.

The landscape felt utterly familiar—

from a distance the mesas and land forms could have been Utah or northern Arizona. The soils are mostly derived from shales and are apparently circumneutral or even acid, which surprised me. Unlike Western America, there seems to be relatively little calcium in the rocks of the karroo. Both landscapes are dominated by gnarled, dwarf shrubs—almost entirely *Artemisia* and *Atriplex* in the dry West, but in Africa the variety of shrubs was bewildering. Mostly Compositae, they were almost all beautiful ornamentals: dark-green-leaved *Pteronia* with large yellow flowers; *Eriocephalus* in a number of species, all with small white flowers transforming into woolly seedheads; many species of *Euryops*—some with waxy, succulent leaves, others with tiny, raspy leaves. At many stops, we saw neat mounds of *Osteospermum cuneatum* with habit and dusty gray leaves resembling *Atriplex cuneata* somewhat, only with 3" cream and yellow flowers. There are also unexpected families, such as gnarled shrubs in the Campanulaceae called *Lightfootia*, which had tiny stars, sometimes yellow, sometimes pale lavender. There were frequent groves of dwarf, desert persimmon in a number of species, forming dense colonies. Unlike the West where the same two or three shrubs can dominate for thousands of square miles, the species composition changed at every stop, and new genera and even families kept cropping up.

And the ground layer is a rock gardeners dream! There are a few familiar genera—*Dianthus*, for instance. At every stop there were pinks rather similar to the European species we already grow. At one place near Fraserburg I found a cushion with a trunk of a root that would be the envy of any bonsai enthusiast—at least an inch and a half across: decades old for certain. A few species of familiar genera of mints, *Stachys* forming billowing silvery mats among rocks on many cliffs with large pink flowers and a powerful smell that justified the common name "Dead man's mint," a wonderful, tiny gray *Ballota africana* with much larger flowers than its European cousins. There were dried remains of bulbs everywhere, *Albuca, Galaxia, Homeria, Lapeirousia, Moraea, Ornithogalum* and who knows what else. There was even an *Allium* that must have been native along one stretch of lonely highway.

Of course, there were succulents everywhere—primarily mesembryanthemum but also large cushions of *Drosanthemum* from deep pink to white; spiny *Eberlanzia* looking like some Mediterranean *Sarcopoterium* on steroids; *Malephora* and *Ruschia* and *Delosperma* in many species that seemed to vary significantly from one hilltop to another; and smaller clumps of annuals—true *Mesembryanthemum* and the famous local *Pherolobus*. We finally even found *Aloinopsis*, one of the true specialties of the colder, central karroo. This was the only pink one, *A. spathulata*, which by midsummer had retreated into the dusty clay, leaving only a few leaf tips visible.

It was surprising to find plants that I associate with gaudy annuals, such as *Nemesia*, forming dense and very perennial mounds several places along the Roggeveld. At least three kinds of these have germinated well and come into full bloom less than a half year from the time I first saw them. It remains to be seen how perennial they prove in Colorado—but even as annuals they are attractive.

I had seen pictures of *Selago* in various picture books on South African plants, so I immediately recognized the first of these I saw in the wild. Imagine a veronica with billowy, puffy flowers as if it had studied posture

from a baby's breath. Sometimes the starry flowers are pink, and often white, but most often they are a variety of lavender shades or even a range of blues from powder and lavender to cobalt blue.

For rock gardeners the genus *Aptosimum,* commonly called karroo violets in Africa, will undoubtedly become a major new pinnacle to conquer. There are several dozen species of *Aptosimum,* one occurring on practically any roadside in the karroo. These may be tiny tuffets, like *A. procumbens* studded with bright blue flowers (photo, p. 197). Imagine a lax rosette of a compact, glossy-leaved penstemon such as *P. humilis.* Now imagine that flowers are stemless, an inch or more across in thick clusters of true blue. I doubt that I will ever forget a thunderstorm that punctuated the drive between Sutherland and Fraserburg early this year. As we tried to speed as quickly as possible over the slick tarmac, I noticed dark mounds along the road. Stop the car! It looked as if some jokester had planted innumerable giant cushions of *Vitaliana primuliflora* ssp. *canescens* randomly across the desert pavement among prickly mounds of *Eberlanzia*—an acanthamnoid succulent with powdery gray leaves and pink flowers. The *Vitaliana* look-alike turned out to be much stiffer to the touch—almost spiny. Eventually we determined that this was either *Aptosimum spinescens* (photo, p. 197) or something quite close to it. We were to see this again and again throughout the Roggeveld, but never as densely pulvinate as at our first stop. The cushions were studded with hard, round seed capsules that were almost—but not yet—ripe. Finally we found a fresh bloom—identical to *Aptosimum procumbens* and pure blue. A mound in full bloom would be quite a picture—and a delightful plant pun to put along *Vitaliana.*

Of course, it is more than a little presumptuous to write about the karroo on the basis of a week's travel in the middle of the summer heat there. So varied is the flora in this extraordinarily rich, vast region that the local botanists find it necessary to specialize, and few pretend to know the flora comprehensively. From a few dozen strolls and hikes over the period of a week I know I saw more fascinating and attractive mats, cushions and tuffets than I have seen in months in the Northern Hemisphere.

My final day spent exploring in the karroo was on top of a broad table mountain just north of Calvinia called Ham Tam Mountain—Hamtamberg in Afrikaans. It is privately owned by ranchers who are sensitive to overgrazing, and the flora appeared to be quite pristine on top. The tableland was perhaps 15 miles across with 1000' cliffs all the way around. We were given keys to go through several stock gates, and we wound up a narrow path to the top, where broad slabs of naked stone were exposed on much of the surface. A dizzying assortment of shrubs and herbaceous plants grew across the top—which was considerably cooler than the dry desert below. There were *Nemesia* still blooming, and many of the dozen or so species of *Helichrysum* were at the peak of bloom.

All of a sudden we began to see giant, symmetrical mounds with a very alpine look to them. They were of a densely pulvinate *Ruschia,* one of the largest genera of mesembs. You could probably walk upon it and not make any dents in the cushion. Only a few pink flowers persisted on a few individual specimens, but the plants were simply stunning in their vegetative state—studded with hundreds of deep

maroon capsules. Some of the barren rocks where this grew in thick flocks must have looked as if they were covered by giant scoops of raspberry ice cream in early December.

I left the karroo behind me wistfully—so much like my native Western landscape, only filled with endless novelties. What would the Drakensberg hold?

The Drakensberg

I was very lucky to be accompanied by Kuus Roux—a botanist from the Compton Herbarium at Kirstenbosch. Kuus is the leading authority on South African ferns (many species of which he has named, and genera as well.) Our plan was to circumnavigate the principal ranges of the Drakensberg—visiting strategic sites on the west side first, then to the north, next to the famous Sani Pass half-way down the Drakensberg on its east face, with several days devoted to exploring the East Cape Drakensberg at the southwestern terminus of the range toward the end of the trip.

There were a few species of plants we saw again and again, such as *Euryops tysonii* (photo, p. 198), *Passerina montana* and *Felicia filifolia*, all three of which were common throughout the karroo as well, although they lagged by many weeks and even months in blooming cycle from the desert species up there. *Felicia filifolia* is a deep blue-green leaved shrub that was completely covered with deep lavender-blue daisies in spring. I was surprised to see it in fynbos as well, making it one of the most universal and abundant plants of South Africa.

The first day we drove into the Drakensberg on the peaks just east of the large and bustling metropolis of Maseru, capital of Lesotho. The lowland vegetation of that country is very lush and subtropical, and has been largely displaced by agriculture and free-ranging livestock of all kinds. But as you climb higher onto passes and the mountains, shepherds find it harder and harder to watch their flocks and get them back to safe haven for the night. Consequently much of the high country was still pristine.

As we ascended to the rather overstated "God Help Me Pass," I was extremely agitated to have spotted my first *Dierama* (7' tall and lavender), and *Zantedeschia albimaculata* in all the moist swales. We again dropped back into the steamy lowlands, where giant eucalypts make me question just how cold it could get here. Throngs of little children pursued our car through villages. With considerable relief we climbed out of this lowland and saw before us broad patches of color staining the hillsides on the next pass. Blue Mountain Pass is one of the better known places in Lesotho for alpines, and the density of plant species there, the extraordinary beauty of the massed flowers and their vibrant shades compare with the most beautiful meadows I have seen anywhere in the Alps or Western America (photo, p. 201).

Shrubby mounds of *Geranium pulchrum* with silver leaves and mauve faces grew in drifts everywhere, contrasting dramatically with nearby scarlet patches of *Phygelius capensis*. One charred hillside was punctuated with the gaunt black carcasses of *Buddleia loricata* and the commonest native shrub, the rosaceous *Leucosidea*, marking a burn of an earlier year. But underneath these and between them a dozen or more species of just one genus, *Helichrysum*, grew as tiny, white-flowered tuffets, large shrubby mounds

with yellow flowers, and ground covers. In places, deep violet-blue *Senecio speciosus* formed thick colonies alongside glowing salmon *Diascia anastrepta,* which itself formed mounds 3' or more across and over 2' tall (photo, p. 200).

No wonder *Delosperma cooperi* is so hardy; here at almost 7500' it makes dense mats on a wet cliff (photo, p. 200). Many, many species of ferns grow on steep cliffs. Orchids are tucked away among rocks, and different orchid species grow in wet meadows. Here I became acquainted with a dozen or more exotic plant genera. Two of the most widespread were Scrophulariaceae: intensely aromatic *Sutera* in every color imaginable, and *Zaluzianskya* with bright scarlet stripes along lower surface of the corollas. Grassy knolls were lit up with innumerable pale yellow flowers of *Scabiosa drakensbergensis* and numerous stately clumps of *Berkheya,* the Drakensberg specialty that looks like a hybrid between a very choice thistle and a sunflower.

I lost count of what was blooming after nearly a hundred different kinds—but I was never to see such a magnificent meadow of solid, cardinal colors again on the trip.

A half-mile or so farther along brought us to the summit of Blue Mountain Pass with its endless views in all directions across the deep green Lesotho countryside. An altogether different group of plants arrayed themselves across the top of the mountain, beginning with a new assortment of *Helichrysum.* Many years before I had received *Helichrysum bellum* and *H. marginatum* from this very spot; they are now indispensible July-blooming everlastings for the Rock Alpine Garden. And here they were in the wild, looking just like my plants in the garden! Nearby, *Helichrysum aureum,* the only large-flowered yellow strawflower in this part of the Drakensberg, grew in a vast colony that was in full, puffy seed. The large, yellow-bracted flowers should make superb everlasting bouquets.

Soon I began to notice tight cushions on some rocks—*Helichrysum sessiloides*!—the tiniest and most abundant saxatile everlasting. A number of species of white-, pink-, and purple-flowered forms of *Erica* grew densely in low spots among the grasses. A giant patch of blue *Selago* grew tight against the ground.

Amazing numbers of succulents were everywhere. *Crassula* ranged from sedum-like tufts in the rocks to the shrubby *C. sarcocaulis,* which grew 3" or more in height and breadth and was covered with waxy, ivory flowers. Pale pink and white *Delosperma* dominated this hill, along with rather congested mounds of yet another *Ruschia, R. putterillii,* surely the highest altitude Mesembryanthemum. There, in the distance, was a flash of scarlet. The closer I got the less likely it seemed—and then I realized that this was the highest elevation *Cotyledon orbiculatum* (photo, p. 198) I could imagine. This is perhaps the most widespread succulent I saw in Africa. It grew on cliffs near the sea in fynbos, on open slopes in the karroo and here near freshets on top of the Drakensberg! Very reluctantly I returned to the car, knowing that every few feet there were yet more intensely beautiful ornamentals completely new to me.

The very next day we had established ourselves in Sir Harry's Hotel in Harrismith, a bustling and picturesque town nestled at the base of yet another Table Mountain (this time called Platberg), some 30 miles

north of the main Drakensberg escarpment. Kuus was surprised I wanted to spend a day on top of this mountain that was a thousand feet or so lower than the main ranges of the Drakensberg. The entire Platberg is a preserve and well fenced, and I was fortunate to have his guidance. The cliffs responsible for the table-like shape are largely sheer and unscalable by casual hikers, but Kuus quickly led us up "One Man Pass"—which might have been appropriately named "Screaming Baboon Pass" that morning, for our distant cousins managed to curdle my blood when they launched into a vigorous family squabble a few dozen feet from me.

Views of Harrismith and the blue and distant high berg would have made this hike memorable even if I hadn't noticed a single flower. Here again, an extraordinary number of ornamentals came into view every few feet: There was a deep blue *Streptocarpus gardenii* in pockets on the rocks in the woodlands; several *Pelargonium* species including the gigantic, peachy yellow *P. lurida* along the road. An *Ipomoea* with 5" flowers of velvety purple-maroon formed a deep-green-leaved mat (photo, p. 198).

Superficially *Barliera monticola* looks like some sort of brooding, violet blue penstemon, but closer inspection reveals the *Ruellia*-like structure of the flowers and the stiff *Acanthus*-like pose of the flower stems. Once we reached the top of the mountain an incredible array of flowers wove a veritable tapestry of color everywhere. On rock outcrops around a pond near the edge a particularly exciting assortment of plants appeared: *Hebenstreitia,* wand-like scrophs with speckled white or yellow flowers, formed wide drifts everywhere on the top. Several *Crassula species* made big patches of creamy white on rocky ground, often interspersed with bright blue or violet *Nemesia capensis.* One of the most congested mats of *Helichrysum* I have ever seen, sprinkled with stemless, pink buds, grew among over an outcrop. When will I ever see it in bloom? Nothing seems to match its form in Hilliard and Burtt's magnificent monograph of the genus. And then, there was another dream! A delightful, clump-forming race of *Helichrysum chionosphaerum* with small mats of linear leaves and 6" stems with bubble-like white and yellow blooms on top.

Bulbs were everywhere, the odd *Albuca,* an occasional *Gladiolus,* hot pink *Hesperantha* on cliffs and speckling a meadow. Then the exotic, whorled flowers of a *Bulbine* on stems less than 1' high really captured my imagination—no seed, darn it! Kuus summoned me over some hundred feet ahead. On a gentle south-facing slope, among three or four species of tangled rock ferns he found a huge plant of *Aloe aristata* in full bloom, with dozens of giant racemes. The bent scarlet trumpets were beautiful. The deciduous-leaved *Aloe ecklonis* grew nearby in a pure yellow phase—a delightful rock plant barely a foot high.

Among patches of *Gazania linearis* studded with nosegays of yellow bloomed a hot pink *Delosperma* of the *ashtonii* group, the two forming a rather disturbing contrast. And then, another marvel—a dense mound of tiny, blue-green heads, on *Euphorbia pulvinata.* This is rather smaller, making a flatter mound than the magnificent *E. clavarioides* that I saw on practically every hot slope of the Drakensberg.

As we gradually worked our way

to the edge again and found one of the few descents over the cliffs, a whole new vista and assortment of plants appeared. *Dianthus basuticus* made big masses of wide-petalled pink flowers over dense tufts of foliage—incredible! Hundreds of husky plants of *Hirpicium armerioides* grew coarsely on 8" stems in the tall grass—very different from the utterly prostrate and nearly stemless species from Blue Mountain Pass.

How carefully we picked through rocky areas, for *Agapanthus campanulatus* ssp. *patens* grew in such dizzying numbers everywhere (photo, p. 203). The stark cliffs even had a misty blue tinge from a distance due to these lilies of the Platberg, which emerge out of every crevice, redefining the meaning of rock plant. Platberg must be one of the most inspiring hikes a gardener could dream of on a toasty January day.

Mont-aux-Sources

The second highest peak of the Drakensberg forms the divide between Lesotho, Kwa-Zulu/Natal and the Orange Free State. The classic approach is via Witziehoek, an elegant subalpine resort in what used to be the QwaQwa homeland. Fantastically rich subalpine meadows filled with color climb toward the escarpment, and for many miles the cliffs drip with ferns, several mat-forming *Helichrysum* species, and airy sprays of *Wahlenbergia undulata.*

The car was quite secure in a barbed-wire enclosure at almost 8000' at the base of the Sentinel, an immense block of basalt that has drifted, so to speak, a mile or so north of the main escarpment. A wonderful, wide path snakes up the steep cliffs for several miles, and an extraordinary assortment of alpines crowd the edges, distracting you from the dizzying vistas off toward Platberg and the rolling plains of the Orange Free State.

In the morning we were greeted with a number of delightful *Moraea species* drooping gracefully from cliffs: I could identify *Moraea trifida* and *M. modesta*—willowy-stemmed plants with pale blue-and-white-speckled flowers. Dense clumps of *Moraea alticola* did a good job of mimicking *Iris pseudacorus* in steep gorges on the way up the mountain—only with gigantic pale yellow flowers 6" or so across. What a contrast to *Moraea alpina* a few miles higher on the summit plateau, barely an inch or two high with prismatic flowers an inch across. Late in the afternoon as I scampered down the mountain a little worried that evening might descend before I did, all these were closed, but in their place there were tremendous drifts of *Moraea inclinata*—a vivid-blue-flowered plant with four or more flowers on each stem a foot or so high (photo, p. 203). Kuus told me of finding *Moraea carnea* in the gorge below us. And who knows what might have been blooming a few weeks later in the season in just this one genus.

Other bulbs included at least two species of shockingly blue *Aristea*: who would have dreamed they'd be up here at 9000'! Several kinds of *Dierama* grew on the mountain—a giant one (*D. cooperi*?) on top, but the queen of the mountain that day had to be *Dierama dracomontana,* growing in dense colonies with thousands of tomato-red bells swaying. Whole cliff faces were dotted with the tiny cones of a dwarf pineapple lily, *Eucomis humilis,* and ghostly colonies of *Galtonia viridiflora* often grew out of mossy beds on the way up (photo, p. 203). I was particularly

startled to find large mounds of *Nerine bowdenii* in full bloom in the equivalent of July. This is obviously a different form from that in cultivation, and at 9000' it may be hardier as well.

One other bulbous plant cannot be omitted: *Crocosmia pearcei*, apparently named only recently. A colony of this giant-flowered alpine with stems barely a foot high startles visitors as they depart the parking lot.

For over 50 years English growers have propagated a vivid purple *Osteospermum* under the name *O. barberiae* var. *compactum*. *Osteospermum barberiae* is an intensely aromatic plant from low altitudes. The would-be variety *compactum* is *O. jucundum*, the purple daisy of the Drakensberg. I found dozens of mats identical to the deep magenta-purple forms sold as var. *compactum* growing almost a yard across. No wonder it's considered so much hardier than *O. barberiae*—this is a *bona fide* alpine that probably experiences frost most any month of the year in nature, and it will not condescend to grow in Cape Town, because it needs a long cold winter. On Sani Pass I found it again, only a much pinker color and dwarfer habit. But on Platberg it was an icy-cool white. Rock gardeners must enjoy this everblooming gem as long as we can, for it undoubtedly has a glorious horticultural future as an edging to borders or even as a ground cover.

Mont-aux-Sources possesses a palette of plants entirely different from those of the Platberg and Blue Mountain, and so very different from what I was to see farther south! I was practically feverish from the extraordinary panorama, the lush, dripping tundra on either side of the path, pulling out camera, taking notes, looking first at a plant close-up, then gazing out to the melting distance. Soon Kuus was far out of sight, and I found myself at the foot of a chain ladder, the only way to scale the last hundred feet onto the top of the plateau.

I hadn't noticed the wind blowing before I began to climb up the clinking, clanging rungs. Better not look down. Higher and higher I climbed. Suddenly I saw up above me two rather fierce looking warriors with Zulu style shields and spears—without a stitch of clothes, despite a stiff alpine breeze. This unofficial welcoming committee has probably startled quite a few visitors. The men gestured "smoke a cigarette" in a universal sign, and I paused—I hoped anything I said or gestured in return won't mean "Please throw me off this cliff" in Sotho. I smiled and shrugged sort of vaguely and walked off quickly. Looking back, I realized that the welcoming committee are probably two shepherds playing hookey, enjoying a few hours of tourist viewing. I'd never thought of myself as Sotho television before. Incidentally, all this transpired in view of a colony of *Delosperma nubigenum* growing on the cliff right along the chain ladder. Kuus luckily picked a tiny sprig from this spot and showed it to me once we met again back at the car that evening. I never noticed it—for some reason!

The summit plateau at the base of Mont-aux-Sources constitutes a huge, gentle, rolling bowl a mile or so wide, sheer cliffs falling off toward the Northwest and Northeast. In January practically every plant in the bowl is in full bloom, including solid carpets of several species of *Rhodohypoxis* in wetter areas and dense mats of *Helichrysum flanaganii* yards across, completely hidden under yellow pussytoe blooms.

There are mottled-leaved *Disa* orchids with pink or purple flowers, and a shaggy white-leaved shrub, *Eumorphia sericea,* with almost waxy white daisies mimicing the way shrubby potentilla grows in the Northern Hemisphere. The composites are abundantly represented, with bright purple senecios, white helichrysums of a dozen species, bright yellow flowers like the cutleaf, trim *Ursinia alpina.* There are densely packed mounds of *Macowania sororis*, growing a foot or two high along the cliff edge, incredibly wooly *Helichrysum trilineatum,* and *H. splendidum* blanketing the area.

As far as I can tell, the only plant on the entire summit plateau *not* blooming was *Helichrysum retortoides.* This remarkable miniature shrub is only an inch or so tall, branching and spreading along the ground, with glossy, dark green leaves reminiscent of a tiny willow. Only a few blossoms were fresh—pinky-white everlastings 2" across, but hundreds and hundreds were filled with fluffy, blowing seed.

The vista was utterly exotic, speckled with mounds of white and yellow, violet and red flowers. These festive colors are so much more vivid than those usually seen in the Northern Hemisphere.

Here on the Mont-aux-Sources would be a good place to set up camp and spend a week or two. If Heaven isn't this floriferous, this rich in species, this colorful, I imagine I will be disappointed. Assuming, that is, that I'm even admitted!

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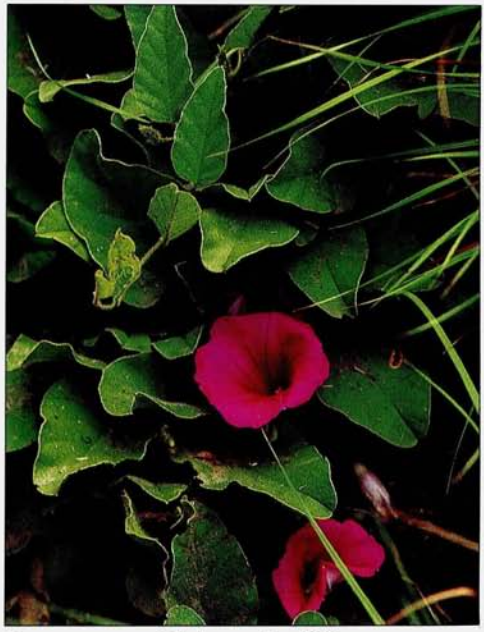
Aptosimum procumbens at Sutherland Observatory (p. 190)

Aptosimum spinescens (p. 190) photos by Panayoti Kelaidis

Cotyledon orbiculatum
on Blue Mt. Pass, Lesotho (p. 192)

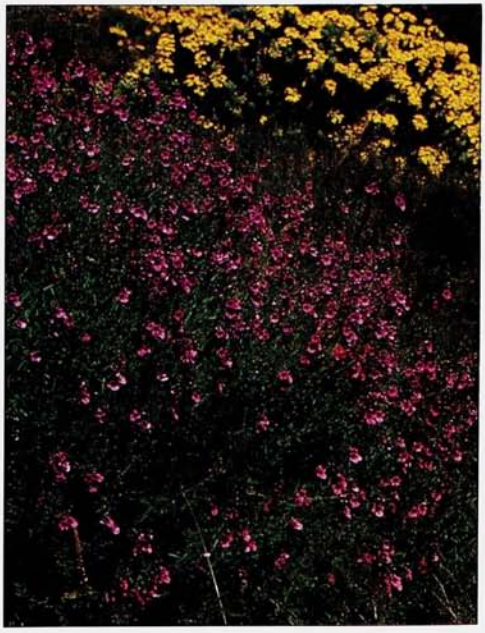


Ipomoea sp. on Platberg (p. 193)

photos by Panayoti Kelaidis

Delosperma sp. 10 miles north of Sani Pass

Diascia integerrima, Euryops tysonii
at Sani Pass (p. 191)



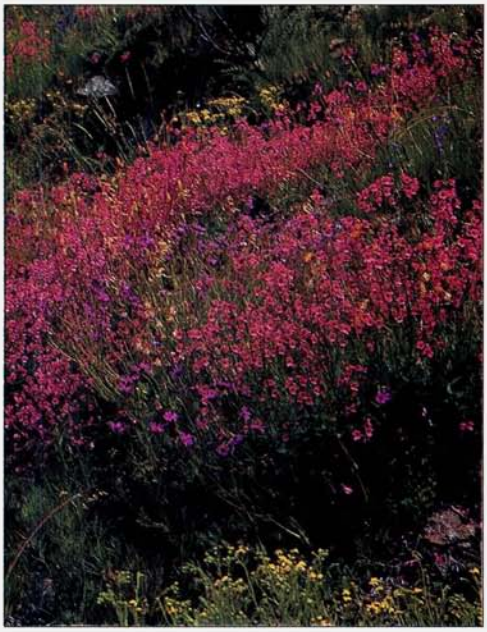
Hermannia cf. *stricta*, on Hamtamberg

Crassula sp. at Blue Mt. Pass

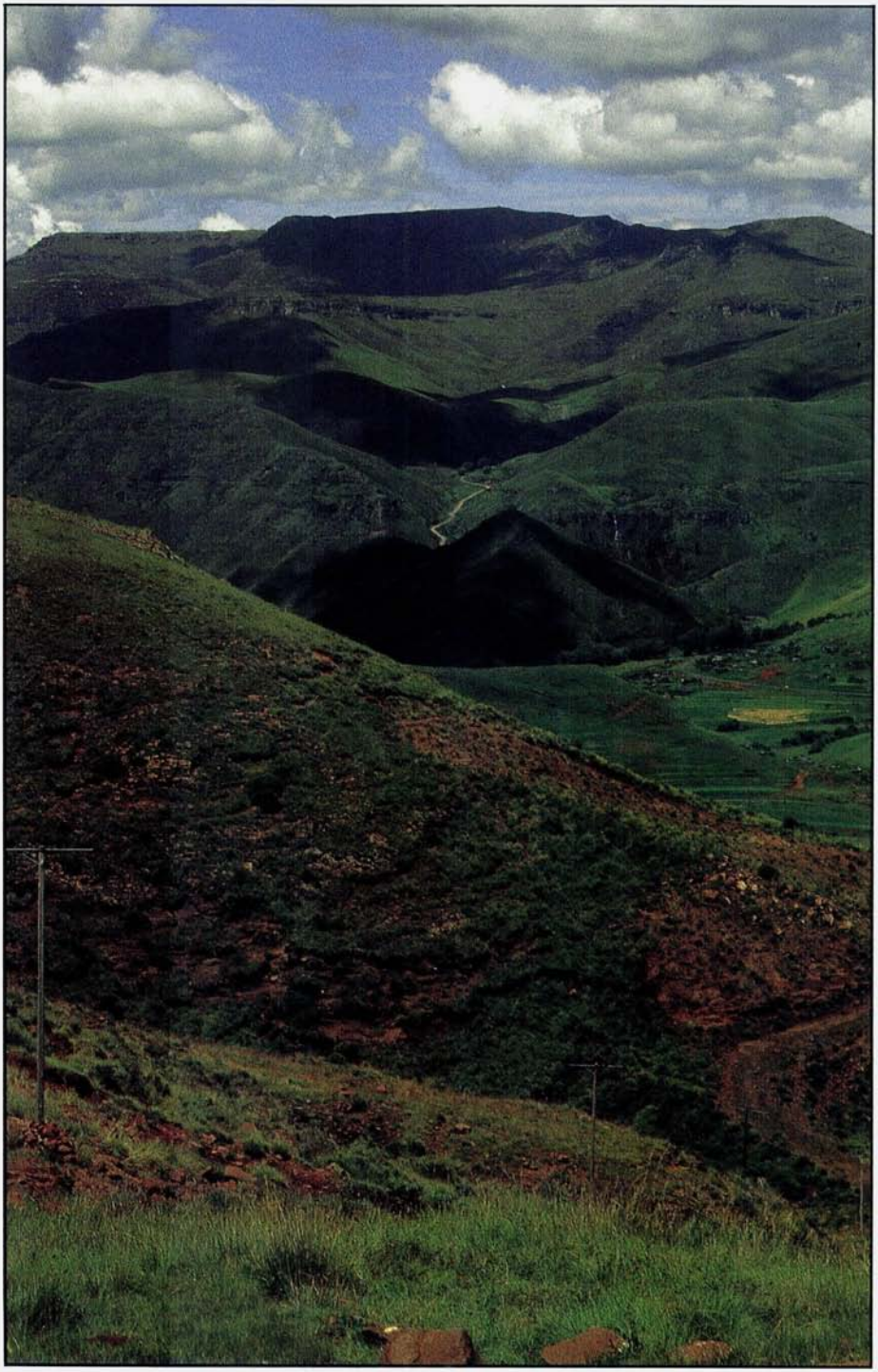
Delosperma cooperi at Blue Mt. Pass, p. 192

photos, Panayoti Kelaidis

Diascia anastrepta at Blue Mt. Pass, p. 191



Delosperma sp., Blue Mt. Pass



Blue Mountain Pass, South Africa (pp. 191-192)

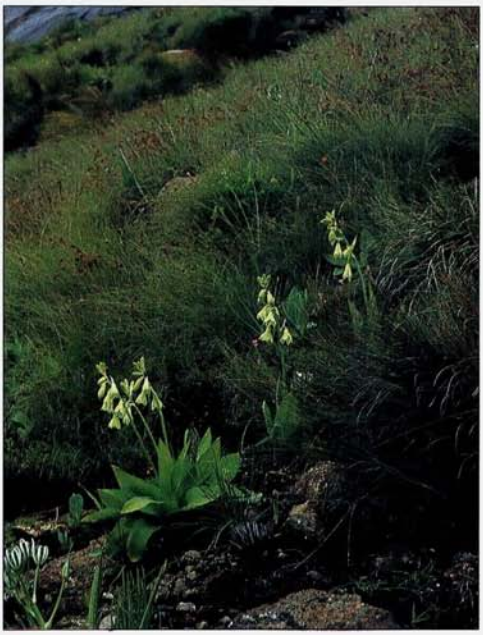
Mont-aux-Sources, South Africa photos, Panayoti Kelaidis

Macowania glandulosa

Agapanthus campanulatus ssp. *patens* on Platberg (p. 194) photos, Panayoti Kelaidis

Moraea inclinata on Mont-aux-Sources (p. 194)

Galtonia viridiflora, Mont-aux-Sources (p. 194)



Faiferlik garden, Czech Republic. "A small lake dominates this garden. The universe isreflected in its surface at night, the neighboring rich vegetation during the day." *Butomus umbellatus, Lysimachia punctata,* above. Below, a more autere part of the garden, with *Physaria didymocarpa, Yucca baccata.*. Photos by Jaroslav Faiferlik

Troughs

A Few More Comments

by Waid Vanderpoel

I've been asked to comment on any points missed in the wonderful last issue of the ARGS *Bulletin* on troughs. What can I add to the marvelous assemblage of information, expertise and tips set forth in the six excellent articles which collectively covered troughs—would that we could mulch as completely as this topic was covered. My good spouse read those articles and informed me I'd be writing a very short piece. Nevertheless, I'll give it a try.

Regional troughs

More rock gardeners are utilizing this concept. It is one I have always enjoyed, partly because it provides interesting contrasts of foliage. Regional trough themes allow us to create miniature landscapes aimed at simulating nature—a goal towards which we strive.

How long do troughs hold up?

After fifteen to seventeen years I do observe serious deterioration of the structure of my oldest troughs. However, the modern acrylic bonding agents and fibers mentioned in Michael Slater's articles should extend trough life, possibly dramatically.

Evergreens in troughs

While Anita Kistler would disagree, and her reason is based on solid, successful experience, I do not feel my own experience would support the use of evergreens in troughs over a long period of time. I have two small troughs each containing a handsome little *Picea abies* 'Echiniformis'. However, the roots are so dominant that only one faithful *Erigeron pinnatisectus* survives as a companion in one trough after a dozen years, while nothing else remains in the second trough.

What do you do with a trough now dominated by only a very few faithful old plants?

This is not an easy question, and it is probably best decided by each individual rock gardener. However, most gardeners will enjoy their troughs most if

they own at least containers boasting some relatively young plant communities. Life's greatest expectations come to the young—troughs or people. If a dominating but still interesting plant can be replicated by seed, cuttings, or division and planted elsewhere, the decision to relenquish it in the trough is simplified.

Is there an ideal trough age?

Rock gardeners strive to group plants such that neighbors mature on a complementary scale. Young plants can be introduced into obvious spots, but I find I enjoy troughs where most of the space is occupied by plants of fairly similar maturity. A trough can look mature in three years; in fact, many plants look wonderful after two years. Conversely, some troughs look enchanting a decade or more after the original planting, though by then a number of the first inhabitants are only a memory. Matching trough plants is always challenging, always fascinating.

Troughs in water

Troughs, by variations in size, shape, soil mix, location, and plant material, lend themselves to experimentation. I've had my share of failures. However, I would like to share a winner with you.

I've always enjoyed growing little Aleuritia primroses, particularly *P. farinosa*, *P. frondosa*, and *P. halleri*. The books say they like "damp meadows." On our visits to the Alps, they could usually be discovered, and often by the hundreds, even thousands, near the tiny little brooks and rivulets that drain sunny meadows. However in my garden in the sun, in our intense Midwestern heat, they often wilted and needed near constant attention. I established some primulas in complete shade, where they have thrived to this day, though perhaps they are not as compact as one might like.

I consigned some *P. farinosa* to a small trough and placed it in our fishpool in an inch or inch and a half of water (photo, last issue, p. 120, center left). This was to be the equivalent of a wet, sunny meadow. Since hypertufa is water porous, the soil, even though the surface was 3-4" above the water, wasn't wet—it was soggy! At first the primroses thrived—I kept waiting for them to rot out in the autumn. They looked remarkably healthy for plants about to perish. The little trough wintered in a cold frame and in spring exploded into growth, then into bloom. The tight little plants had considerably shorter stems than those in the shade—but produced a mass of dainty little flowers.

Over the years these little sun lovers have thrived with precious little attention. Every year, there is a surge of bloom, never a sign of wilt no matter how intense the sun, how high the temperature. I've added troughs, tried other species. I later planted several species of *Dodecatheon*, a genus notorious for its tendency to wilt when it is hot and dry. All three species have thrived for five or six years. If you have a pool and like little primroses and shooting stars, give the technique a try.

Species for troughs

After Geoffrey Charlesworth's masterful exposition on species for troughs, there isn't much I can add. Despite the differences in our climates and rainfall, Geoffrey's observations on certain short-lived plants closely parallel my own experience. I'll simply provide observations on plants based on my experience.

Androsace—would be ideal except most small ones succumb in my garden to the combination of summer heat and wet. *Androsace chamaejasme* and *A. villosa* have both persisted as species though with casualties among individual plants. Certainly a premier genus for trial and error.

Aquilegia saximontana—is trough-sized, miniature, pretty, neat, easy, persistent as a species. Has never produced strange gawky hybrids.

Arenaria obtusiloba—seldom mentioned in our literature, but a winner for me. Makes a persistent, attractive, tight mat—even deigns to bloom now and then.

Dianthus—only wee, tight ones which appear at home in a trough.

Draba—lots of potential material, American, European, Asian—but choose the tiniest species.

Erigeron—any small, neat ones are trough material. *Erigeron pinnatisectus*, though larger than many, rates a description such as "particularly nice foliage, faithful, tops in bloom."

Gentiana verna —far from immortal; consider growing more every two years.

Lesquerella arizonica—rather new to me. Tiny, neat, gray foliage, colorful in bloom and easily grown, but expect casualties. Grow a few every year—a small charmer.

Myosotis alpestris, an alpine forget-me-not you can grow. Persistent and trough-sized. Overlooked since it isn't its glamorous cousin.

Petrocallis pyrenaica—a tiny gem from the European Mountains. For me, difficult to get past seedling state—BUT the three I own which met this challenge have been with me for a number of years. Give it a try—with special attention at time of first transplanting.

Penstemon—any attractive, smaller, low member of this vast race can be considered good trough material. *Penstemon aridus* has faired very well for 15 years in my troughs. *Penstemon hallii, P. eriantherus* (those big, exotic blooms display wonderfully in a trough) and *P. teucrioides* are ones I've particularly enjoyed. Experiment to the hilt.

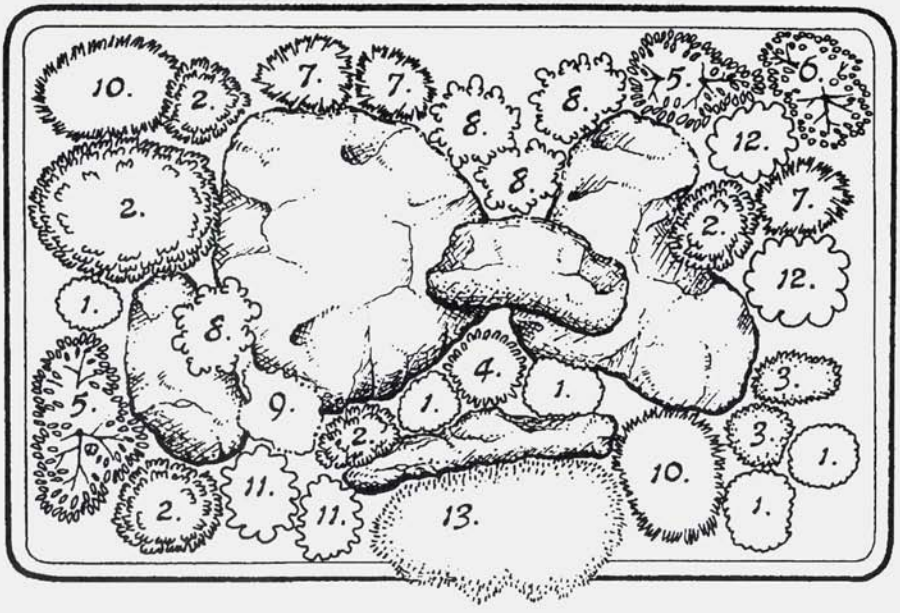
Primula—in mountain-setting troughs I enjoy species auriculas, *P. auricula, P. clusiana, P. daonensis, P. hirsuta, P. marginata* (obtain a good form—quality varies widely) and certain Bernina Pass hybrids, particularly *P.* 'Windrush'. I find *P. villosa* too large, while *P. glaucescens, P. minima, P. tyrolensis*, and *P. wulfeniana* have all shared one characteristic in my garden—they have a death wish. Hybrid auriculas should be small, compact and floriferous.

Saxifrages—You will try them in your troughs, and you should. They are even more appealing when you can see them up close.

Silene acaulis—One of my top favorites, as much for foliage as its bloom, and can often overcome damage.

Townsendias—ideal for troughs, but given to sudden death. Since they are easily grown, a solution is to have a stream of young plants in our "farm systems."

Waid Vanderpoel has a large garden near Barrington, Illinois. He has been gardening in troughs since 1976. Many of photographs of his troughs appeared in the last issue.



Colorado Rockies

Waid Vanderpoel, Barrington, Illinois

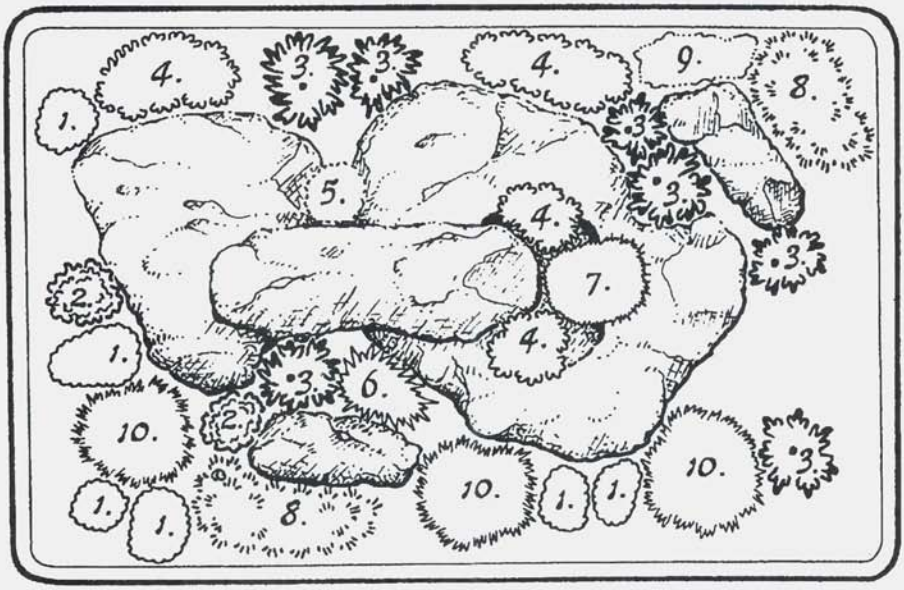
SIZE: Length 36" Width 24" Height 8" (all outside dimensions)

EXPOSURE: east-southeast, but slightly more sun than Alps trough

SOIL MIX: 2 parts sharp, coarse sand; 1 part gravel, 1 part humus (peat and leaf mold)

TOP DRESSING: stones and coarse gravel

1. *Draba*
2. *Erigeron* sp. and *Erigeron pinnatisectus*
3. *Androsace chamaejasme*
4. *Myosotis alpestris*
5. *Penstemon aridus*
6. *Penstemon* (small)
7. *Townsendia* sp.
8. *Aquilegia saximontana*
9. *Sedum lanceolatum*
10. *Silene acaulis*
11. *Hymenoxys acaulis*
12. *Hymenoxys grandiflora*
13. *Arenaria obtusiloba*



Alps

Waid Vanderpoel, Barrington, Illinois

SIZE: Length 36" Width 24" Height 8" (all outside dimensions)

EXPOSURE: Facing east-southeast

SOIL MIX: 2 parts sharp, coarse sand; 1 part gravel, 1 part humus (peat and leaf mold)

TOP DRESSING: stones and coarse gravel

—Strive to attain vertical effect with rock placement

1. *Draba*
2. *Petrocallis pyrenaica*
3. *Primula*
4. Encrusted saxifrages, set into holes drilled in rock
5. *Thlaspi rotundifolium*
6. *Gentiana verna*
7. Kabschia saxifrages, set into holes drilled in rock
8. *Vitaliana primuliflora*
9. small cultivars of *Sempervivum*
10. *Silene acaulis*

Hypertufa Rocks

by Wayne Kittredge

Among the memorable events of my rock garden career was the ungrateful upbraiding I received from those to whom I had generously given samples of my latest batch of homemade hypertufa rocks. Winter had turned the soft "rock" into mush, leaving the plants my friends had so lovingly planted sitting atop heaps of ashy mud. Instead of a showy home for a treasured specimen, there was now a mess to clean up. My own rock had suffered the same fate—what to do but apologize?

But my need for tufa was undiminished, so I have continued undaunted to experiment with my hypertufa rock recipe, having as my goal a product that not only looks like real tufa but behaves like real tufa. This year I built a walled garden using my most recent recipe, and shortly after completion visitors claimed to have mistaken the rocks for real tufa.

My first hypertufa rocks—not the ones I gave to friends, but the first batch— used 6 parts peatmoss to one part cement. I built a mound of this in whatever shape the fancy ran to and covered the whole with standard hypertufa mix of 3 parts peat, 3 parts perlite, and 2 parts cement. I cut holes through the layer of standard mix for planting and holes on the bottom for drainage. While the surface was still wet, but after it had set slightly, a culinary fork was used to poke holes shallowly and densely over the entire upper surface to give the rock some semblance of real tufa (photo, p. 224). Over the years, rocks made of that recipe have proven durable. Encrusted saxifrages grow elegantly on them, while *Lysimachia japonica* var. *minutissima* believes it owns every available growing hole. *Dianthus alpinus* submits to life in a planting hole and occasionally spends a few flowers, while *Draba aizoides* flourishes and flowers with its usual abandon, although it does not seed into the fake tufa.

Because the original artificial rocks were performing well, I began reading about the chemical character of cement and other ingredients, hoping to improve on the mix. I got sidetracked on the matter of the cosmetic appearance of the surface of the rocks, trying acrylic paints, waterproof cements, cement pigments, even pottery pigments; none of these were much use, and the kitchen fork

method, while very labor intensive, produced the most satisfactory appearance.

I tried more ingredients—perlite for lightness; vermiculite and long-fiber sphagnum for moisture retention; wood chips for their ability to decompose eventually, leaving air gaps as well as humus in the rock; and diatomaceous earth because of its reputation for deterring bugs.

After the mush incident, I overreacted by using waterproof cement as the outer layer over a softer core, hoping for greater strength and better moisture retention. Waterproof cement is, however, pure white and pure ugly, *and* it cracks over winter, although the rocks do not usually actually fall apart. Many plants dislike this very hard and very alkaline white cement, yet others like *Gypsophila nana* and *Dianthus gallicus* have taken to it without complaint, and *Symphyandra wanneri* has sown itself into the cracks and made very neat, healthy rosettes.

The next year I added play sand (a dolomitic limestone available as sand-size grit, used primarily to fill children's sand boxes), an expanded clay product (designed to absorb liquid floor spills), and grass clippings (or other organic material which would break down fairly quickly, unlike wood chips). When organic matter breaks down, it leaves channels for roots to penetrate, similar to the channels caused in real tufa by water movement during the formation of the rock.

The ratio of ingredients in hypertufa is inexact and is apt to change according to availability or whim. However, if the ingredients are used in the ratio of 6 parts non-cements to one part cement, then the rocks are likely to be durable. Even though the soft core is covered by standard hypertufa, it must be able to retain its own integrity and not go to mush. A recipe I now favor might be: 4 parts Portland cement: 16 parts peat moss: 1 part diatomaceous earth: 1 part play sand: 1 part expanded clay: 1 part vermiculite: 1 part perlite: 1 part long-fiber sphagnum peat: 1 part grass clippings: 1 part a serendipitous ingredient of your own choosing.

Over time, hypertufa weathers and becomes quite handsome, but that can

take years. It's worth spending some effort in applying the surface to have it look natural. The most irregular, lumpy surface looks most like real tufa. The kitchen-fork method previously mentioned has its merits, but I've found a neat and efficient short cut. Apply diatomaceous earth to the very wet to slightly set outer surface. Diatomaceous earth can be shaken or thrown onto the surface by hand (use gloves), resulting in somewhat spotty coverage, or blown on with a rubber ear syringe. Complete coverage of the surface is the goal. Diatomaceous earth gives the surface a grainy appearance instead of the glossy surface of cement. Excess diatomaceous earth may be washed off after the cement has set for a day. Spraying the wet surface with a solution of chelated iron after washing imparts an uneven tan stain. The finished color is a combination of the gray of the cement, the grainy white of the diatomaceous earth, and the tan stain, the whole bearing a remarkable resemblance to real tufa. The kitchen fork method can be used in addition, but I feel it is unnecessary.

Plants already occupying the August 1993 wall built of these hypertufa rocks include: *Acantholimon araxanum* on top of the sunniest, windiest part of the wall, *Aethionema armena* in the hottest, windiest planting hole, and in crevices: *Campanula andrewsii* v. *hirsuta* in shade, *C. cashmeriana* beneath the *Aethionema armena*, *C. hakkiarica* in shade, and *C. waldsteiniana* in sun, *Convolvulus cantabricus* on top, *Draba acaulis*, *Draba paysonii* on top and out of the wind. *Hypericum athoum* has positively filled a vertical crevice with its cute, fuzzy, rounded leaves below the *Acantholimon araxanum*. *Primula marginata* (named clone) has a shady crevice away from the wind and is kept purposely very moist; it is flourishing. *Saxifraga* is already creeping out over the hypertufa surrounding its planting hole, *Thymus* 'Elfin' peeks out at the sun from a deeply overhung crevice. *Teucrium subspinosum* and *Verbascum dumulosum* have escaped their pot prisons into sunny crevices, which I am hoping will provide enough protection for them to survive zone 5 winters. This spring, potted plants of *Campanula zoysii* and *Physoplexis comosa* were planted in the wall. I still have ample room to sow seed and put in plants. The hypertufa rock wall provides an attractive setting for plants that prefer crevices.

Readers might think the alkalinity of the hypertufa could be a liability. However, in my experience, the peat moss neutralizes the alkalinity of the other ingredients adequately. I don't expect to be able to grow the entire range of plants one can grow in real tufa, but I am encouraged by the successes I have had to date.

Wayne Kittredge gardens in North Reading, Massachusetts.

What Do They Want?

by Bob Nold

A few years ago I had the opportunity to visit what is probably the most unusual rock garden I have ever seen. Not that I get around much, and not that I enjoy finding my innate and entrenched snobbery revealing itself in a variety of uncontrolled gestures (walking hurriedly around the garden), but here was a garden, a rock garden, shockingly devoid of anything I considered "appropriate," consisting almost entirely of hundreds of miniature roses. I don't like miniature roses. Miniatures, in my opinion, have no place in the rock garden, and there are plenty of people who will agree with me. Of course, there are plenty of alpine roses that are small and suitable for the rock garden, but they're species and not lilliputian hybrid teas. I mentally made comparisons with another garden I knew, featuring every known lawn ornament highlighted with matching colored gravel—and hurried home to tend my androsaces.

Snobbery is a strange state of mind, usually a sign of an inability to think for oneself, a mind too ready unthinkingly to receive codified, narrow opinions. There are certain plants that simply have no place in rock gardens—it says so right here. Look, "no miniature roses under any circumstances." And earlier it said—I had skipped this part—"no cacti."

In fact, I even came across a brief article practically condemning the very existence of cacti, as though they were some horticultural abomination threatening the concept of rock gardening as practiced since the dawn of time. The next page had a picture of a woodland plant. Why are woodland plants acceptable in rock gardening circles and cacti (not to mention miniature roses) are not? No woodland plants this side of the Himalayas grow at higher altitudes than does *Pediocactus simpsonii*, an alpine if ever there was one, so whence the prejudice? There are many arguments to be made. It could be said that the majority of rock gardeners live in areas more amenable to the growing of woodland plants than to cacti, and that the sheer acquisitive nature of plantsmanship brought woodland plants into rock gardening's ambit. It could be said that, being primarily desert plants, cacti represent an unwelcome intrusion into the rainy greenery of the

average garden concept, and that miniature roses, being products of hybridization, are artificial plants having no place in what is essentially a wildflower garden, regardless of the climatic zone it represents. Well, who says so? Every book I know on the subject implicitly (at least) admits that "alpine" is a term used not as an adjective, meaning in precise terms plants come from high mountain meadows in the Alps, but as a noun, referring to plants "suitable for the rock garden." "Suitable," here, can safely be interpreted as meaning "of a certain height or character."

So you *can* have cacti—*and* miniature roses if it's absolutely necessary—in a rock garden, after all. You can even have bananas, if you want—the dwarf kind, to be sure. The purist will stand his/her ground and still insist that these are inappropriate criteria. "Let's admit nothing but plants under six inches," the suggestion might go, deriving this rule from the truth that all "high alpines" are indeed small—but this then excludes *all* woodland plants, many being small but none being "high alpines," but admits many cacti and even a few miniature roses. This definition could be carried further: only plants from certain geographical areas, only plants which bloom in spring, only plants having orange flowers with purple stripes, only plants whose names have the letter "b" in them, and so on.

I have at hand a very interesting document: a computer printout of the number of first choice requests for seed from the 1992-1993 ARGS seed exchange. More than a collection of "rules" determining what should or shouldn't be grown in rock gardens, this printout shows what it is that ARGS members want in the way of plants for their gardens. Of the first 50 most-requested plants on the list, half are woodland plants. Not "high alpines," but woodland plants. To be sure, there are no cacti or miniature roses. Of the first 25 entries, five are species of *Arisaema*. In fact *A. sikokianum* and *A. backii* were the top two most-requested seeds; six times as many requests for these as for a classic high alpine like *Androsace vandelii*. *Shortia*, another genus currently in fashion, is represented by five species totalling 369 requests. There are also *Trillium nivale, Anemonella thalictroides*, and so forth, interspersed, of course, by the usual classic choices such as *Campanula zoysii, Aquilegia jonesii*, various forms of *Lewisia tweedyi*, and the perennial favorite (if not perennial in the garden) *Eritrichium nanum*. A cynic (although there are surely none among rock gardeners) might point out that aroids are in fashion, and that ten years from now cacti or miniature roses might head the list, given enough exposure. Maybe everyone has the *Androsace*, and it's now becoming *passé*. This printout, more than any textbook on rock gardening or any rules of appropriate plant choices handed down in secret through generations, tells us what rock gardeners think should be in their gardens. All these plants are desirable, all are beautiful. Rock gardeners want their gardens, whether they are woodland gardens, high alpine gardens, cactus gardens, or miniature rose gardens, to be filled with beauty and interest. When selecting plants appropriate for a rock garden, that's all you need to know.

Bob Nold gardens in Lakewood, Colorado, specializing in dryland rock plants, but sampling all—well, almost all.

Seed Exchange 1994

1. **Seed listings will be accepted only until November 1, 1994**. Later ripening seed will be accepted *only* if an alphabetical listing has been received before that date. **Overseas members**—please mail before October 15th.

2. **Any amount of seed is appreciated.** Less than 5 seeds will **not** be listed. To receive donor privileges (10 bonus packets) send a minimum of 5 different kinds of seed suitable for the rock garden.

3. **Send *clean* dry seed as early as possible.** We appreciate several mailings as the seed ripens. You will be issued a 1994 donor number with your first submission. Please include this number with subsequent mailings.

4. **Use paper envelopes no larger than 2" x 4".** Use separate envelopes for each kind of seed. One small envelope is usually sufficient, except for such large and frequently requested items as *Arisaema sikokianum, AA. backii, candidissimum, purpureogaleatum, Glaucidium palmatum* or *Trillium*

Trillium simile. Besides the preceding, the following smaller items are always in short supply: *Campanula zoysii, Aquilegia jonesii, Eritrichium nanum, Dicentra peregrina, Lewisia tweedyi, Campanula piperi, Shortia soldanelloides, Shortia galacifolia, Paraquilegia* spp., *Jeffersonia dubia, Phlox hoodii* and *Dionysia involucrata.*

5. **Mark, legibly, each envelope with the botanical name printed in block letters.** If collected in the wild, state the location.

6. **On the Seed Donation Form provided** (as an insert in this issue of the *Bulletin*) **list the botanical name in alphabetical order,** followed by: the **class**, Annual, Biennial, Bulb, Fern, Shrub, Tree; the approximate **height,** including flower, in inches; the flower **color**, red, blue, bi-color, mixed, etc.; the **location** if collected in the wild; the reference book or **Flora** *if* this is a new listing for the seed exchange. Be sure to fill out the donor name and address.

7. **Group envelopes alphabetically. Check that seed envelopes sent match the list.** Secure the envelopes with a rubber band and enclose in a padded mailing envelope with the Seed Donation Form. Be sure your name and address are clearly written on the outside of the mailing envelope. Ask the postmaster to *hand cancel* the envelope.

8. **All members of NARGS will receive a seed list**. When you receive the list, please return your order promptly.

Mail seed early to:

Elisabeth Harmon, Director
1994 NARGS Seed Exchange
75 Middlebury Road
Watertown CT 06795, USA

Awards

Award of Merit

Given to persons of demonstrated plantsmanship who have made outstanding contributions to rock and alpine gardening and to NARGS.

Barry Yinger

We are very proud, as members of the Watnong Chapter of the North American Rock Garden Society, to be able to announce that Barry Yinger has received the Award of Merit. He has indeed made outstanding contributions to rock and alpine gardening and to the NARGS and is unquestionably a person of demonstrated plantsmanship.

His career interests were set from an early age, when he graduated with high honors earning an interdisciplinary degree in botany, horticulture, and Asian languages. He served a term as Curator of Asian Collections at the US National Arboretum, where he designed and developed Asian Valley and led the first of many plant expeditions to Korea. Since then, he has organized and carried out more than 30 explorations to Japan, Korea, Taiwan, and England. His ability to speak Japanese and Korean has been an important asset.

From 1988 until recently, he has been Director of Horticulture for the Somerset County Parks, in charge of ornamental horticulture for a 6,000-acre park system. A primary focus of interest was the Leonard J. Buck garden, 33 acres of alpine and woodland gardens. Here he improved the plantings and increased the educational value of this beautiful landscape, by careful labeling of plants and by issuing weekly lists of what to look for in the garden as the bloom season progressed.

His contagious enthusiasm, his can-do attitude, and his really extraordinary knowledge of plant material have been major influences on gardeners in our area. Membership in the Watnong Chapter greatly increased, and he frequently attracted outstanding speakers and programs. His Obsession Weekend, the 1993 Eastern Winter Study Weekend he organized as chapter chair, was a sell-out and genuinely enjoyed by many people. His personal obsession is asarums, and he certainly seems to know all there is to know about this genus.

Barry has introduced many new plants into this country and several have been named for him, e.g., *Hosta yingeri.* Some of the best nursery catalogs mention him as the source of special offerings. He is always willing to share a cutting or rooted plant of something unusual.

He has presented programs to many groups, including the NARGS, the International Plant Propagators' Society, the New York Botanical Garden, the Perennial Plant Association, Longwood Gardens, the Missouri Botanical Garden, and garden clubs too numerous to mention. In addition, he has published articles in *Arnoldia, Plants and Gardens*, the *American Conifer Society Bulletin*, the *Bulletin of the American Rock Garden Society*, and many other journals. Barry maintains an active membership in many horticultural organizations, including the International Dendrology Society and the Hortus Club of New York.

Late last year, Barry moved back to his family farm in Pennsylvania, where he tends a significant garden. He is an advisor on new plants in the nursery industry and continues to serve as consultant to several organizations.

Barry has been honored by the Japanese government for service to the Japanese nursery industry, and it is fitting that we be able to honor him here in North America.

—Jeanne T. Will

Ev Whittemore

Evelyn (Ev) Whittemore has been an active member and has ably served the North American Rock Garden Society at national and chapter levels for a number of years. Her term as National Board Director continues through 1995. She directed the ARGS Seed Exchange for several years and under her direction the seed list came out before Christmas. She has contributed articles to the *Bulletin of the American Rock Garden Society*, as well as to chapter newsletters. Her interest in alpine and rock garden plants may be expressed as "At the drop of a hat, Ev will travel from coast to coast to find a rare or unusual plant." She finds rocks, too!

Her garden friends are national and international, and she stays in touch through correspondence and seed and plant exchange. On many occasions she has hosted gardening friends from here and abroad.

Before moving south to North Carolina about ten years ago, Ev was a member of the New England and the Connecticut Chapters of the NARGS. In June 1986 she was instrumental in chartering the Southern Appalachian Chapter, and, largely through her efforts, the chapter has grown and prospered. She and her husband Bruce opened their home, gardens, and hearts for the chapter meeting place. Ev was elected our first Chairman, and during the past five years she has

given many programs: slides, workshops on trough making, seeds, seedlings, plants and plantings, and the basics for making a rock garden. She always provides choice plants from her gardens for our plant sales.

Ev and Bruce live in Penrose, North Carolina; their place is called Fort Courage. It is a natural beauty spot crossed by a flowing stream with a waterfall. Several years ago Ev cleared the vegetation from her mountain side and hauled in tons of rock, gravel, soil, and mulch, creating a rock garden, and adding more water features. Fort Courage is unique and interesting; it is a show place for growing and displaying rock garden and alpine plants. Ev's plantsmanship is amazing. Fort Courage has been created with toil, sweat, back-breaking work, and perseverance.

Ev abounds with energy, enthusiasm, and strength. She shares it, too! She cooperates with local garden clubs and other groups for educational purposes and tours of her gardens.

Ev was instigator, motivator, planner, and mover for the 1994 NARGS Annual meeting, Appalachian Spring. In spite of some early skepticism and negative comments about the chapter's "youthful age and inexperience," Ev forged ahead, and the meeting was a huge success.

—Jude Gregg

Marvin Black Award

Given to a member of NARGS who promotes membership in NARGS and organizes meetings. Emphasis is placed on members who have helped other people to reach their potential in the plant world.

Eleanor Brinkerhof Spingarn

The 1994 Marvin Black Award is presented to Eleanor Spingarn of Georgetown, Connecticut.

Ellie was one of the organizers of the first Eastern Study Weekend, held in Atlantic City, New Jersey, in 1969. Subsequently, she was the guiding force in the organization of Eastern Study Weekends held in Connecticut in 1974 and 1981 and served as general chairman for the 1994 Eastern Study Weekend in Stamford, Connecticut. She was also involved in the planning and organization of the 1978 Annual Meeting, held in Stamford, Connecticut.

In addition to the above activities, Ellie was responsible for organizing the Connecticut members, initially as a district within the North Atlantic Region and, after a change in the bylaws, as the

Connecticut Chapter. In the early days of the chapter, she initiated annual seedling sales for the purpose of making choice plants available to all members at modest prices. For the first several years, these sales were held at Ellie's home in Georgetown, and many of the plants were provided from her very successful propagating benches.

For many years Ellie has been an inspiration, not only to members of the Connecticut Chapter, but to members of surrounding chapters as well. She is richly deserving of this award.

—Richard Redfield

Marcel LePiniec Award

Given to a nurseryperson, propagator, hybridizer, or plant explorer currently actively engaged in extending and enriching plant material available to rock gardeners.

Panayoti Kelaidis

Panayoti Kelaidis has brought excitement, high expectations, new ideas, and new plants to Colorado gardens. Private gardeners, nursery people, landscape architects, and individuals who wish to build Western-style gardens are constantly requesting his counsel. With Panayoti's help, the rest of the world is beginning to realize that the joys of gardening in Colorado have been a well-kept secret.

Panayoti has also made outstanding national and international contributions to gardening. Few individuals have ever grown so many diverse plants so well or shared them more widely.

Panayoti is an acknowledged authority on the cultivation of alpines, with a similarly wide knowledge of native herbaceous and woody plants, as well as those from temperate climates from eastern and southern regions of the world. He is an avid reader and scholar, researching the latest floras and systematic treatments to discover new species of possible interest to rock gardeners. His enthusiasm for the unattempted, the unknown and the exotic never flags or wanes.

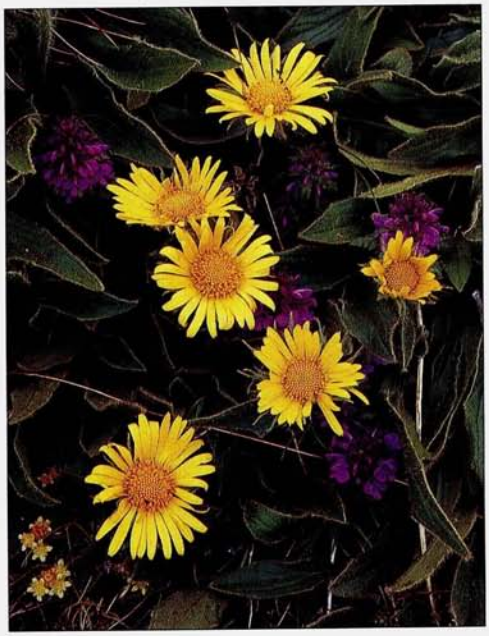
Nor is he content merely to grow thousands of kinds of plants, artistically displayed. As much as a collector of endless appetite, Panayoti is a dedicated seedsman. He can spot a novel species of *Eriogonum* in seed on a roadcut while driving 60 miles an hour on a blazing-hot afternoon when his travelling companions are wiltingly longing for the comforts of camp. He's never too tired to collect that smidgen of seed from his garden after a long day's work. And for years

Faiferlik garden

Campanula alpina (p. 166) Joann Knapp

Anemone narcissiflora (p. 166) Bob Means

Doronicum styriacea (p. 166) Joann Knapp

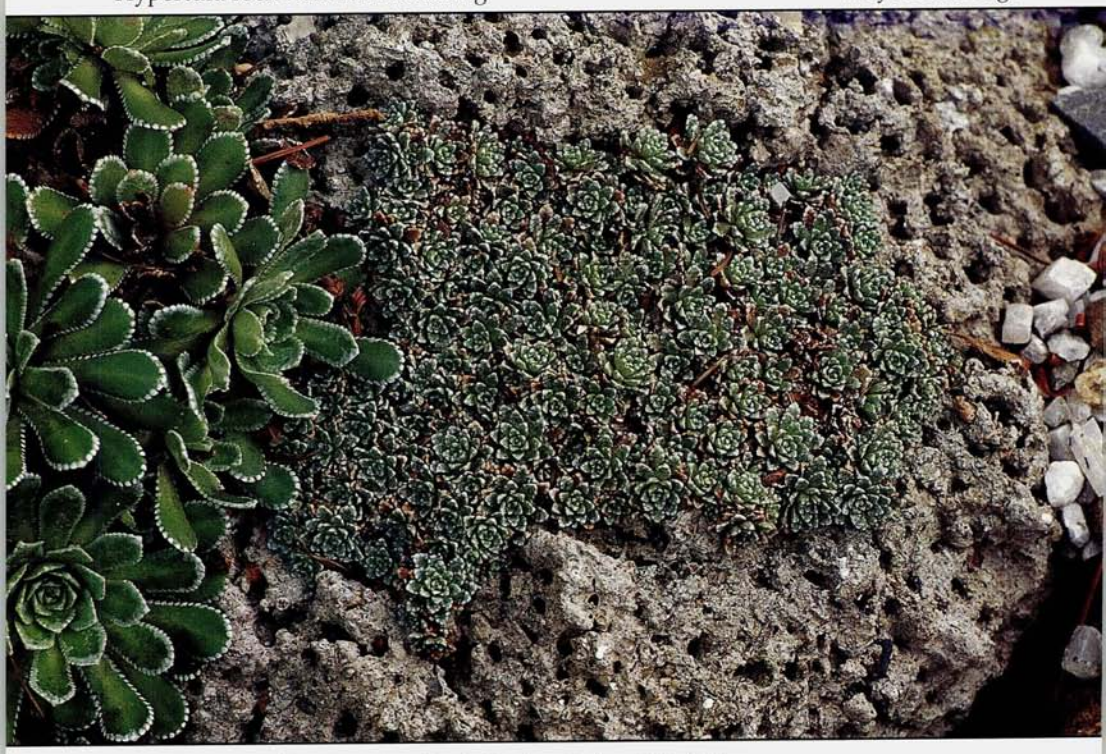


Campanula tatrae (p. 166) Bob Means

Pedicularis verticillata (p. 166) Joann Knapp

Anemone caroliniana, p. 227 Karen Schellinger

Hypertufa rock with fork texturing Wayne Kittredge



he has enlisted the enthusiastic help of his volunteers at DBG in collecting hundreds of kinds of seed for distribution to other botanic gardens, nurserymen, and interested growers. He has been a driving force in Rocky Mountain Rare Plants, his wife's commercial seedlist, which has led the way in offering seed of Western American natives not before distributed commercially.

Among plants now common in cultivation because of Panayoti's efforts are *Delosperma nubigenum, D. cooperi, Veronica liwanensis,* and *Penstemon* 'Claude Barr'.

Yet Panayoti is not a taciturn mountain man or a reclusive scholar but rather a charismatic and active participant in a wide range of horticultural organizations, continually sharing his knowledge and discoveries with others. He has lectured locally, nationally and worldwide: at the Royal Horticultural Society, the International Rock Garden Plant Conference, the National Meetings of the North American Rock Garden Society, the Perennial Plant Association, and the Western Region of the American Conifer Society. He has been active in these groups at both national and local levels. He has spoken at conferences in Canada, the United Kingdom, and Sweden.

As curator of the Denver Botanic Gardens' Rock Alpine Garden, Panayoti has collected, planted, observed, and continuously learned about how plants grow and can be grown in many different microclimates. He estimates that he has grown as many as 10,000 kinds of plants in this garden, often growing a dozen or two individuals of a new accession at a time, testing them in the many ecological and edaphic situations of the Rock Alpine Garden.

The knowledge and experience Panayoti has acquired in all his plant adventures has been shared with a wide national audience, through his writings directed both at specialists and general audiences. Some of the intriguing titles included in his list of publications are: "The Chihuahuan Phloxes," "The Tethyan Garden," "Prickly Charmers," and "Spontaneity on the Rocks."

Bob Nold, a sophisticated collector of specialized plants, credits Panayoti with making it possible to have more plants than he could have dreamed of in his life. He writes, "A luminous sky-blue *Aquilegia scopulorum,* choice townsendias, Western micro-phloxes, penstemons, cacti, dwarf parsley, *Astragalus,* Turkish salvias and androsaces, acantholimons, fuzzy and spiny things from the Mediterranean, mesembryanthemums—the range of plants is astonishing, the discrimination impeccable. Collectors of eriogonums will find their gardens infinitely enriched thanks to Panayoti's enthusiasm—I must have half a dozen varieties and forms of *Eriogonum ovalifolium* alone in my garden. The flora of central Asia now finds regular representation in our gardens, thanks to his re-thinking of the relationship of garden climates to plant choices. His recent expedition to South Africa may well prove to be the event that makes Panayoti's name holy to rock gardeners for generations to come."

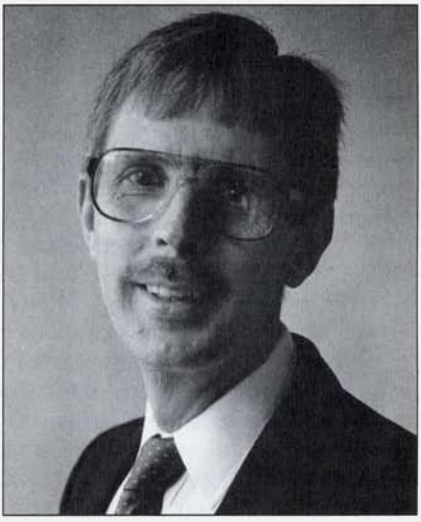
Panayoti has received three major awards from the North American Rock Garden Society, the Award of Merit, the Edgar T. Wherry Award and now the LePiniec Award. Linc Foster is the only other person to have received all of these awards. Congratulations, Panayoti.

—Sandy Snyder

Edgar T. Wherry Award

Given to a person who has made an outstanding contribution in the dissemination of botanical and/or horticultural information about native North American plants.

Noel Holmgren



It is with great pleasure and absolute certainty that I state that the description of a Wherry Award recipient is the perfect description of Dr. Noel Holmgren. No one who knows him or his extensive body of work can doubt that his noteworthy contributions have increased our knowledge of North American native plants. His writings on the Western flora are not only of high standing in the scientific community but are relevant and useful to the ardent amateur naturalist and gardener as well.

Dr. Holmgren's field experience is extensive and far-ranging, well beyond the borders of this country, to South America and Asia. His professional positions have culminated in his present ones as Curator of the Herbarium of the New York Botanical Garden and Editor-in-Chief of its scientific journal, *Brittonia*. But it is from his numerous publications that the members of our Society have most benefited. We have learned much from his descriptions of new species and his clarifications and taxonomic revisions, notably of *Castilleja* and (the current NARGS favorite) *Penstemon*. More directly, his generosity with his knowledge and his time have served those chapters that have invited him to lecture. But his most valuable contributions have been his work in the *Flora of the Great Plains* and, especially, the several volumes of the *Intermountain Flora*. As we are finally learning to value our own western American flora, his publications guide us and often ride with us as we explore the back roads of the West. They assume an added significance for us as preparations are made for the 1996 Annual Meeting in Utah.

—Joyce Fingerut

[Editor's Note: A new volume of *Intermountain Flora* has just been published, this one covering the Asteraceae of the Intermountain Region. It is available from the New York Botanical Garden for approximately $75. Write Sandi Frank, NYBG, Bronx, NY 10458-5126.]

Plant Portrait

Anemone caroliniana

The first time I saw *Anemone caroliniana* (photo, p. 224) was in Minnesota Chapter member Ed Burckhardt's garden. It was the end of April and a beautiful, sunny day. The bright blue of that wonderful patch of prairie anemone was a sight I will not soon forget. The blooms on 2-4" stems were so abundant that you couldn't see the tiny, wine-green leaves nestled close to the ground. The inch-and-a-half wide flowers with their clusters of bright yellow stamens were the stars of his garden that day as they swayed in the spring breeze.

Anemone caroliniana was a favorite of Claude Barr's, a self-trained botanist and rancher from the Black Hills of South Dakota. He spent much of his life learning about and growing the wildflowers of the Great Plains. In his book, *Jewels of the Plains*, he says this plant grows on its favorite rich loam untouched by the plow. The competitor-protectors of this anemone are low forage plants, mainly buffalo grass, blue grama, and some small sedges. The sparse turf prevents serious erosion during rains, which can be heavy at times.

Anemone caroliniana is by no means growing everywhere on the plains. It does not grow on low, wet ground. It grows in colonies rather than as single plants. Most flowers are white, but there are plants that bear blooms of a magnetic sapphire blue. Others are various lighter tones of blue, some with a white eye; rarest are the few pink flowers.

"Flowers of eight to twenty sepals in a daisy pattern, 4" or so above ground, develop from a small tuber or rhizome an inch or two down. This half-inch or shorter, delicate structure is the vital part of the plant; in the dormant period, from seed ripening until fall, all other parts, including roots, are absent. During lush spring growth, thick, short stolons are sent out horizontally from the rhizome, each to form a new rhizome at its tip, thus slowly developing a colony. Leaves return with fall moisture to remain all winter; healthy leaves ensure good flowering. *Anemone caroliniana* is surely one of the world's prime treasures." —Claude A. Barr

My dear friend Ed entrusted me with a location of this treasure, and I gave my word to keep it safe—and I keep my word. It was exciting to look for *Anemone caroliniana* that fall with Ed: I was almost run over by a train and knelt on a cactus. Of course, we did not find it, because the rains had not returned the tubers to growth. Even when leaves are present, they are so tiny and very difficult to see.

In spring of 1993 I went back to take pictures, only to be rained out and scared by huge rain storms and tornadoes—the road became impassable under a wildly flowing creek that even a cow would be afraid to set foot in, and I had to leave in a different direction.

The next morning was sunny, but there was a stiff breeze. I set off anyhow,

hoping to get some pictures. The wind was blowing so hard, the flowers were lying on the ground, and I thought all the hair had blown off my head. To top it off I kept hearing this roaring that terrified me because I thought it might be another tornado. Finally, I figured out it was jet airplanes taking off from an airport—not to worry! So I vowed to return later to collect seed, and I did. *Anemone caroliniana* listed in the 1993 ARGS seedlist was collected on that prairie, as well as listed in seedlists of other societies of which I am a member.

I have noticed that the small tubers of this plant are sometimes washed out of steep areas in the garden, so I am careful to keep good cover over them in the form of turf or a fine gravel mulch. Some growers have lost this anemone in their gardens after it slowly dwindles away. They thought that perhaps it didn't like limestone, but Barr wrote of finding the plant near limestone bluffs in nature, so that can't be the problem. I think rather that it is a matter of planting them in too lean a soil, too narrow a crevice, or of allowing other plants to grow over them and crowd them out.

—Karen Schellinger

Books

The Genus Arum, by Peter Boyce. 1993. The Royal Botanic Garden: Kew. ISBN 011-250085-4

My sister lives in Israel. A number of years ago, she wrote that she was surprised to see Jack-in-the-pulpits growing there. What she had mistaken for *Arisaema triphyllum* of our childhood days in Connecticut was some species of arum, also a member of the family Araceae.

Those of us who are bemused by aroids and their bizarre flowers will welcome the publication of Peter Boyce's book, *The Genus Arum,* published by HMSO Books in association with the Royal Botanic Garden, Kew. It has the substantial, horticulturally sound appearance one expects of such an institution. The color plates are elegant—suitable for framing—and the black-and-white illustrations of botanical details are of great assistance in distinguishing between the 25 different arum species. Of the maps, the less said the better. Perhaps a box of colored pencils should be included to allow purchasers to fill in the bare outlines.

The text is informative and scholarly without needlessly dry pedantry, even quite lively at times (how else to characterize a description of the inflorescence of *Arum italicum* as "smelling strongly of stale urine or occasionally reminiscent of pineapple and citrus."?). The nomenclature includes an extensive list of synonyms to encompass taxonomic revisions; particulars of each species and subspecies are clearly given, with anatomy lucidly described. Pollination, germination, and cultivation, both outdoors for hardy species and indoors under glass for the tender ones, are also covered.

For both botanists and gardeners, this book will be a welcome, handsome addition to the library of those interested in this genus.

Judy Glattstein

Errata

Vol. 52(2): pp. 97, 124 . Photos attributed to Michael Slater were taken by Jane Grushow. The editor apologizes.
Vol. 52(2): p. 120. Captions are reversed for top right and bottom right photos.
Vol. 52(2): Inside of back cover: The wrong address was given for Elisabeth Harmon. The correct address is 75 Middlebury Road, Watertown, CT 06795.

All the stylized drawings of troughs in this issue (p. 208, 209) and the last issue were drawn by Dick Bartlett.

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