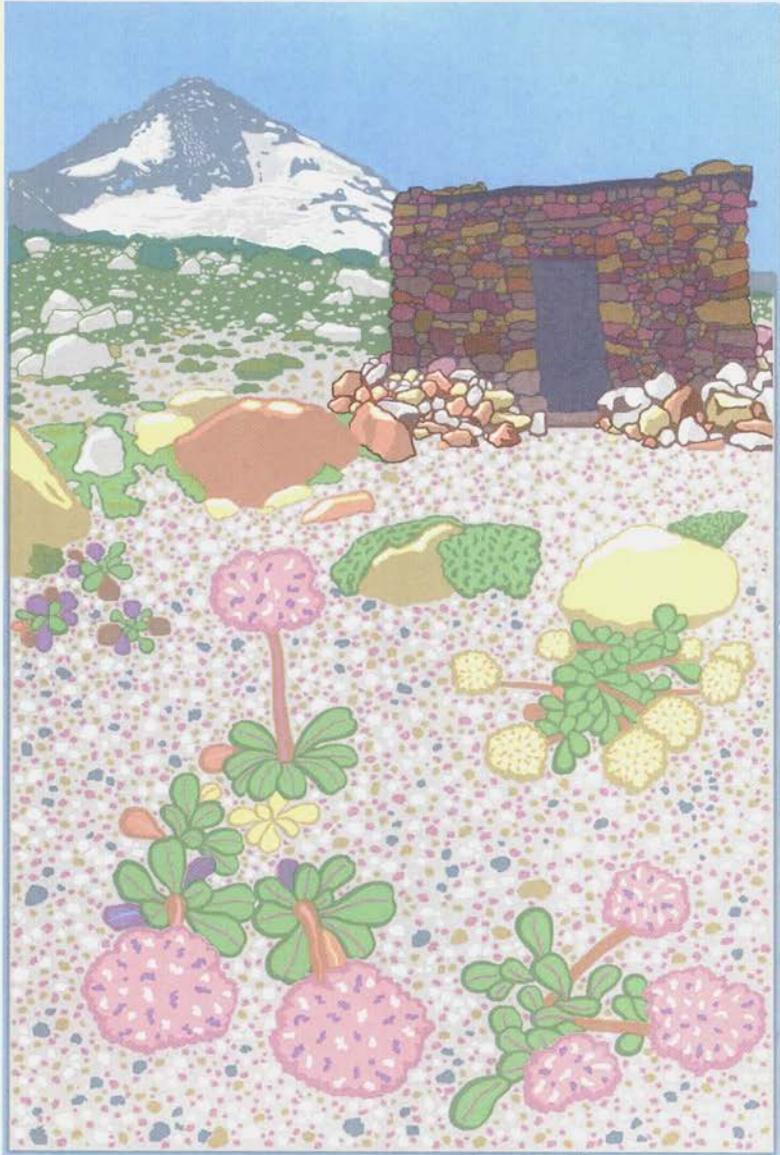


ROCK GARDEN *Quarterly*



Volume 68 Number 1

Winter 2010

Front cover: *Cistanthe umbellata* (*Calyptridium umbellatum*) on Mt. Hood, Oregon, at Cooper Spur Shelter. Original screen print by Sue Allen.

Back cover: *Telesonix jamesii* on Pikes Peak, Colorado. Photo by Malcolm McGregor.

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ROCK GARDEN

Quarterly

BULLETIN OF THE NORTH AMERICAN ROCK GARDEN SOCIETY

Volume 68 Number 1 Winter 2010

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From the Editor

This issue, like many other winter issues through the years, features a preview of the current year's Annual General Meeting. In 2010 this is "Romancing the Rockies," hosted by the Rocky Mountain chapter and held in and around Salida, Colorado, with ancillary events in Denver. The first article describes the field trips that will be offered to participants, and when an annual meeting occurs in the Rockies, this is a tremendous opportunity for NARGS members. Next, Panayoti Kelaidis, one of the deans of Colorado horticulture and botany, describes some of the special plants to be seen in and near the meeting area, as well as in the Denver Botanic Gardens, where participants are invited to a special event. Finally, we are fortunate to have received Charles Hipkin's article on the San Juan Mountains in time for this issue; this area is adjacent to that of the annual meeting and should tempt meeting participants to extend their visit to these tempting sites.

Additional information on the meeting, including an explanation of the innovative arrangements, appears in the *Bulletin Board* newsletter section toward the back of this issue. The official conference brochure and a tear-out registration form are included in the advertising section immediately following the *BB*. You can also register online.

The rest of this issue focuses on practical gardening. Tim Ingram reports on his success with sand beds in England. Maurice Farrier instructs us how to recycle plastic soft-drink bottles into effective pots for growing plants from seed and cuttings.

This issue also reprints a chapter from the indispensable NARGS/Timber Press book *Rock Garden Design and Construction*, in honor of author Larry Thomas's receiving the first Lincoln and Timmy Foster Garden Award for "Special Gardens." His special garden is eleven floors up in a Manhattan apartment building and has inspired urban gardeners for years. We hope that this sample chapter will encourage all who don't yet have this book to buy it, for it includes equally useful information on many aspects of rock gardening in chapters by a range of experts.

As we prepare for press, we don't yet have the results of the 2009 Photo Contest, but we'd like to thank all who participated. It was better than ever, and we'll publish the results and the winning photos in the spring 2010 issue.

Romancing the Rockies: The Field Trips

Kay Galvan

For the 2010 NARGS Annual General Meeting, “Romancing the Rockies,” the Rocky Mountain chapter has scouted some hikes that will give attendees a wide sample of alpine and delightful high-mountain panoramas. The trails vary in difficulty, but they are all above 10,000 feet, so acclimation beforehand is recommended. You can arrive a few days early to do just that, as there is no shortage of magnificent places to see in the Colorado Rocky Mountains.

The trails were abundant with alpine life in 2009. They offer not only good plant hunting but also good walks—walks that people long before us have taken. Native Americans laid down paths now hidden under most of our modern roads and trails. The first Rocky Mountain industry, mining, expanded these so that gold and silver could be sought and supplies ferried. Now tourists travel the same pathways, often by vehicle, not considering those who first made these alpine havens accessible. [Some additional photographs of plants seen on the hikes but not mentioned in these notes appear in the color section. For information on sites and plants of the nearby San Juan Mountains, see Charles Hipkin’s article later in this issue. —*ed.*]

Monarch Pass

The road from Independence, Missouri to Santa Fe, New Mexico stretched for mile after dry mile. Mule trains compacted the highway; freight wagons’ embedded wheel tracks still visible in places. In 1825 the Osage tribe signed a treaty with the U.S. government that displaced them and turned over yet another ancient passageway to European commerce. Fur-trading posts were established along the route, including Bent’s Fort on the upper Arkansas. Goods traveled away from Independence, and furs returned on the same wagons. The Cimarron route was established as the shorter and less steep of two ways over the Rocky Mountains. A railroad was completed to the Colorado border, and the Santa Fe Trail’s heyday ended in 1872, about 50 years after it was founded.

Monarch Pass was along the Cimarron route. Now it is part of U.S. Highway 50, a 3,073-mile road that begins in Ocean City, Maryland and ends in Sacramento,

California. Two brothers named Boone reconstructed it as a toll road, charging traders who carried supplies for silver mining in the mountains.

The day our hike leaders scouted Monarch Pass, Andrew Pierce recalls, “The wind was so strong . . . you couldn’t open a book, but the forget-me-nots (*Eritrichium nanum* var. *elongatum*) were just fabulous as was the moss campion (*Silene acaulis*),” and “a great bunnery lay just twenty feet from the top of the tram,” where fantastic views can be seen in every direction. Drifts of *Saxifraga bronchialis*, some 3 feet across, carpeted meadows and basked in the sun along Old Monarch Pass road a few miles away, but 1,000 feet lower.

Riding the chair lift up gives the unacclimated a chance to get their heads on straight. Going immediately to 11,000 feet can cause dizziness, headache, and the feeling that your legs weigh more than they used to. This ride gets you into alpineland, but easily. You might also use it to get accustomed to the feeling of height and expanse and to become used to drinking enough water—another requirement in the arid West.

Mt. Sherman and the Dauntless Mine

I remember a midsummer morning when I sat eating a snack while watching a crow deftly removing the lid from a fast-food drink cup in Buena Vista’s city park. At 8:30 in the morning I was halfway through my second pint of water, and still feeling a twinge of sun in my scalp, reminders of the good previous day, when our 2010 conference scouting troop arrived near Sherman Pass. Now at year’s end, I can still recall vignettes of the day and am anxious to return.

Crumbling timber buildings up ahead are sad in one sense—relics of hope and labor in the thin air, of fortunes won and lost, of miners’ monotony and the cacophony of mill machinery, shouts, ore cars, and high country wind. In another way, the vacated sites call with voices of mystery, and the surrounding landscape of alpine plants erases the foot traffic and debris heaps of a hardship-filled era.

The hike begins in a friendly, green spot below the mine. A wetland lies adjacent to the parking area, where *Noccaea montana* (syn. *Thlaspi fendleri*) mingles with *Rhodiola integrifolia* among sedges. The saturated ground still receives snowfall water in July, making a sopping and unique microhabitat at the base of the dry, gravelly peak. This site offers plenty to botanize and will occupy visitors for a long while.

The walk explores the ground up to and around the Dauntless mine: road cuts, rivulets recently relieved of snow, and fellfields beneath the large scoop of Horseshoe Cirque. *Cardamine cordifolia* mingles there with *Mertensia ciliata* (photo, p. 17), and *Oreoxis* changes from species to species scattered among other vegetation up the road and trail beyond. Bicolor *Trifolium dasyphyllum* lies next to its punchier purple cousin, *T. parryi*, and *Rydbergia grandiflora* faces shine out like the sun in a child’s painting. The last of *Primula parryi* and a mass of *Caltha leptosepala* watch the last snowmelt trickle down slope. Above, *Sibbaldia procumbens*

reveals itself on moist ground just clear of snow, while *Claytonia lanceolata* and *Chionophila jamesii* rove through a jagged boulder field, tripping occasionally over the puffed tails of *Besseyia alpina* (photo, p. 17). A special clear blue, the spherical heads of endemic *Polemonium confertum* dot the roadside.

Cottonwood Pass

My midsummer, high-altitude sunburn had subsided overnight. It always sneaks up on me in the cool alpine air, and by day's end I can feel its claws digging into my scalp and my forearms tickling with red. "More protection today," I lecture myself. We drive west out of Buena Vista up to Cottonwood Pass (photo, p. 18) on a route laid out during 1879, when silver was found near Taylor Park on the west side of the pass. The pass road was made over an established Ute trail previously used for hunting to the west and to reach a hot spring to the east. The Utes were not accommodating to White prospectors during the 1859 gold rush, but 20 years later they were overrun by settlers, wagon roads, and a prospective railroad as silver prospectors mobbed the mountains, hoping to duplicate the bonanza of Leadville.

I watch while carload after carload of tourists, reminiscent of those scrambling prospectors, park, jump out, and arrange themselves around the Continental Divide sign for photos. Just as quickly, they reload, slam doors, and motor down the other side of the pass. Meanwhile, we rock gardeners creep around on the tundra, looking, admiring, and identifying the delights we find there. A tarn lies just below, surrounded by a trio of willow species: *Salix planifolia*, *S. reticulata*, and *S. arctica*.

Miniature gardens of *Lloydia serotina*, *Veronica wormskjoldii*, and several *Senecio* species; punctuated by vivid, regal *Rhodiola integrifolia*, pink-polka-dot *Silene acaulis*, and *Erigeron simplex* and *E. melanocephalus* keep us busy. *Arenaria fendleri*, *Heuchera parvifolia*, *Saxifraga bronchialis* var. *austromontana* and *S. flagellaris* var. *crandallii*, *Paronychia pulvinata*, and tousled gray clumps of *Smelowskia calycina* var. *americana* (photo, p. 18) grow along the trail above. An unusual find is *Gentianopsis thermalis*. Not having really looked at alpine plants in their homeland for a number of years, all this makes my head spin. The wind rises throughout the day, as it often does on the passes; the tourists continue to jump in and out with cameras at the ready; the hours pass as we build our plant lists on the pinnacle of the Ute trail.

Independence Pass

A miner is traveling to the town of Independence, 3 miles west of the pass recently renamed for it. He'd known it as Hunter's Pass when it was a steep and tenuous trail. Now he pays 25 cents for his horse to pass along this widened version, and another 25 for the pack mule, soon to be loaded with the supplies he

needs to return to his stake. The wagon driver passing in the opposite direction pays 50 cents for his rig. The year is shortly after 1881, when this toll road was completed, chipped out of the mountains by hand tools and manual labor as the gateway to the Roaring Fork valley, another victim of silver fever. Aspen is now more easily accessible, with rest stops and inns along the way. As the miners invade, the Ute Indians are being removed from this, another one of their hunting lands, to a reservation.

Independence (photo, p. 19) is a steep pass with sharp switchbacks that lead to its 12,095-foot summit. Scars of the old toll road are still visible, crisscrossing the highway near the top. The highway ribbons through the montane zone of moist slopes where *Pseudotsuga menziesii*, *Populus tremuloides*, and *Picea pungens* (Douglas fir, quaking aspen, and Colorado blue spruce) thrive. *Aquilegia caerulea*, *Castilleja integra*, and *Aconitum columbianum* grow under the trees, as well as the understory shrubs *Arctostaphylos uva-ursi*, *Amelanchier alnifolia*, and *Rubus parviflora*.

The upper valleys, shaped by glaciers 10,000 years ago, are structured by the conifers *Picea englemannii*, *Abies lasiocarpa*, and *Pinus contorta*. These subalpine woodlands and their open, wet meadows display *Primula parryi*, *Caltha leptosepala*, *Rosa woodsii*, and *Epilobium angustifolium* (syn. *Chamerion*). The plants flowering in July are similar to those on Cottonwood Pass, but the views at this elevation are beyond compare.

On the pass you'll likely see a mass of tourists milling about, as this is one of the most popular scenic stops in Colorado. Asphalt paths from the starting point encourage visitors to stay on track and off tundra, but "about a quarter of a mile up, we reached a break in the buck fence and a trail leading off up a ridge. This is where we began botanizing," recalls Marilyn Moore, our hike advisor this year.

Off that approved tundra trail, "we saw *Podistera eastwoodiae*, endemic, but described by [the Colorado botanist William] Weber as being found in subalpine meadows rather than above treeline." Further along our high-country walk were some particularly tall *Pedicularis scopulorum* under a stand of willows, with *Gentianopsis thermalis* nearby. "We identified six species of *Erigeron* (*E. compositus*, *E. melanocephalus*, *E. peregrinus* ssp. *calianthemis*, *E. pinnatisectus* (photo, p. 22), and *E. simplex*), including the sometimes disputed separate species *E. grandiflorus*." The plants were rewarding at the end of "an exciting ride" up this very high pass.

Weston Pass

Fields of *Ipomopsis aggregata*, *Castilleja integra*, and *Penstemon strictus* sprawl between highway and foothills. Cattle graze among the blooms, searching for grass. Human passersby are smitten by the fields ablaze with blossoms, as late afternoon sunlight flickers through the pasture, intensifying its hues. Driving Highway 285 to the Weston Pass turnoff was a painterly joy last year, a year with above-average rainfall.

You may pass mining sites on your way up Weston Pass (photo, p. 19). This, too, was a toll road during the silver rush and a supply route from Leadville to

Fairplay, busiest between 1878 and 1880. On the pass were *Heterotheca pumila*, *Packera cana*, *Tetraneuris brevifolia*, and *Boechera drummondii* (formerly *Arabis*). Below the ridge, at the bottom of a melting snowbank, were more *Chionophila jamesii* than you may ever see in one place again—worth the hike down and back up again. Some eye-popping blue *Eritrichium nanum* var. *elongatum* and their pink cushion companion *Silene acaulis* are other gems for alpine treasure hunters, finds more precious to us than the ores to the nineteenth-century prospectors.

The hikes chosen for “Romancing the Rockies” will let you sample our sterling alpine plants and glimpse a grueling industry of years long past. Owing to the relatively dry climate, the miners’ artifacts still stand. Toppling structures, tailings, and debris piles have outlasted those who made them, and the plants have carpeted their paths with gentle beauty.

American Penstemon Society Call for Grant Proposals

The American Penstemon Society offers grants of \$100 to \$800 to support projects of modest dimension that will enhance, expand, or otherwise contribute to promoting the enjoyment of penstemons. The current application period is January 1 through March 31, 2010; awards will be announced April 30, and projects must begin by July 1, 2010, and conclude by June 30, 2011.

Applicants must be current members of the APS and may join in order to apply. You may join at the APS website, www.apsdev.org, for annual dues of \$15.

For further information, please go to www.apsdev.org and click on Special Projects, or write to Barbara Lewis <lewisorders@iriscolorado.com> or Lynn Ackerman <LynnMAckerman@comcast.net>.

Rocky Mountain High

Some special plants and places in the Central Colorado Rockies

Panayoti Kelaidis

In North America (if we gently sidestep Alaska and Canada), California has a handful of peaks above 14,000 feet (4267 m), and Washington has Mt. Rainier. But Colorado boasts 54 of the 60 highest peaks of the contiguous United States. For the lover of alpine plants, the extent of Colorado's alpine tundra is almost intimidating. Moreover, much of the higher-elevation territory of the state is very accessible, thanks to the dozens of paved highways that crisscross the Colorado Rockies. You can easily drive above treeline on a dozen highways, and if you have four-wheel drive this number multiplies into the hundreds.

The very vastness of the Colorado Rockies—there are hundreds of peaks above 13,000 feet (3862 m) and probably thousands that rise above the tree line—is something of an obstacle to the visiting plant enthusiast. Where does one begin to explore? Where are the best places? If you turn to the rock gardening literature, you will be surprised how little has really been published. Only a few articles appeared in the *Bulletin of the ARGS* (predecessor to the *Rock Garden Quarterly*) before the 1986 Interim International Rock Garden Plant Conference, which was staged in Boulder and produced *Rocky Mountain Alpines*, the first book to address the subject of alpinism growing in this vast region. Kathleen Marriage, a great English-born nurserywoman from Colorado Springs, and Dwight Ripley, an English-born polymath who lived in New York, both wrote luminous articles on Colorado alpinism for the Alpine Garden Society's journal in the 1940s and 1950s. Only one or two small pieces have been published there since then.

And most of these articles understandably focus on the most conspicuous and accessible mountains near the Front Range where most Coloradans live: Pikes Peak above Colorado Springs is especially prominent. As it was the inspiration for the song "America the Beautiful," it's practically a patriotic duty to drive to the summit and admire the "purple mountain majesty," though most of us rock gardeners think this trope applies better to purple-flowered *Telesonix jamesii* (photo, back cover), which features prominently on cliffs at tree line towering above the "fruited plain."

Mt. Evans has possibly received even more attention, since it is so accessible from Denver and hosts an especially diverse alpine flora. Once you explore these

two lofty peaks, conveniently provided with excellent roads all the way to the summits, won't you have pretty much used up the state? Is there really that much more lurking on all those redundant and receding mountain ranges that you can glimpse from the top of Mt. Evans or Pikes Peak, marching relentlessly towards Utah, New Mexico, and Wyoming?

Yes: there's more to Colorado than a few peaks in the Front Range. Many of the choicest alpine plants found in Colorado do not grow there. Most of the distinctive Colorado endemic alpinines are in fact restricted to the limestone substrates found only in the central mountains of the state. Here is where the numerous strange endemic crucifers noted by Dwight Ripley are found: several species of *Braya*, as well as most of the native *Draba* species. *Penstemon harbourii* (photo, p. 26; one of only two strictly alpine penstemons in the state) grows only beyond the Front Range, and *P. hallii* (p. 20) is much commoner westward. *Physaria alpina* was described from here only in the late 1980s, and *Lesquerella alpina* (p. 20) has its only alpine race as well. A half-dozen species of strange locoweeds are restricted to these central mountains and never found in the Front Range, including bright rose-red *Oxytropis splendens* with frilly gray foliage. *Polemonium confertum* is spectacular throughout the central ranges, but almost absent from the Front Range.

Moreover, a host of disjunct species typical of the subarctic and arctic can be quite common in the central mountains and absent farther east, such as *Anemone parviflora*, *Primula incana*, and *P. egalikensis*. *Primula incana* is quite widespread in the lofty intermountain parklands of Colorado above 9000 feet (2743 m), and along streams as high as 11,000 feet (3353 m) in central Colorado: both species are in the Aleuritita section (formerly called Farinosae), with densely powdery leaves and flowers of dark or pale lavender-pink.

Although the Colorado columbine (*Aquilegia caerulea*) is universal throughout the state, the dwarf red *A. elegantula* is almost restricted to the western slope. This red-and-white Rocky Mountain cousin of the Eastern American *A. canadensis* can form large colonies in shady subalpine forests and usually stays under 8 inches (20 cm) tall.

There are a number of species in the closely allied genus *Delphinium* found over much of the state. *Delphinium nuttallii* is the local manifestation of the ephemeral dwarf delphiniums found everywhere in the West, with dazzling blue flowers in early spring, dying down to a tuber in summer drought. There are several subalpine giants, like velvety purple-blue *D. barbeyi* (photo, p. 26), common in moist meadows: very striking, but very difficult to grow at lower elevations, with the exception of 4-foot *D. ramosum*, with airy sprays of true blue flowers. This generally grows at somewhat lower elevations and has proven more durable in gardens. There is, however, one tiny alpine race found locally in southern Colorado that may be the finest American alpine delphinium: *D. alpestris* is usually only 3 inches (7.5 cm) tall, forming a compact mat. This superlative miniature from the southern Rockies is highly local, usually on volcanic substrates, although I first found it on the limestone of Hoosier Pass. Arguably one of the most stunning North American alpinines, it is easily grown in the garden. It has

been lumped with the giant *D. ramosum*, but the two are so radically different in stature and have such different ecological requirements that *D. alpestris* must be regarded as distinct.

Phlox condensata is widespread at higher elevations from Colorado through the Great Basin. Everywhere this makes a dense green cushion with sharp scaly leaves and intensely fragrant white flowers. Although strictly alpine in elevation (usually over 12,000 feet/3658 m), it has proven quite permanent in trough gardens. In certain areas of the Mosquito Range, its flowers can have distinctive dark eyes. Closely allied to *Phlox*, the genus *Polemonium* seems to have its epicenter in the southern Rockies. The sky pilot (*Polemonium viscosum*) grows particularly robustly in high meadows here, usually flowering in deep violet-blue. *P. brandegei* is a yellow-flowered twin to *P. viscosum*, highly local but beautiful wherever it grows.

Polemonium confertum (syn. *P. grayanum*), the paler true-blue cousin of *P. viscosum*, has a taste for rough scree. The former has much larger, rounder clusters of powder-blue flowers that are showier than those of *P. viscosum*, which has fewer flowers in a distinct one-sided inflorescence. *P. confertum* is usually found in turfy meadows, often flowering best where pocket gophers have recently disturbed the soil, no doubt depositing manure as well as tilling.

Gentiana parryi is abundant throughout the southern Rockies in subalpine meadows, usually blooming in August. Rarer is *G. affinis*, of well-drained meadows in high parkland, which generally has smaller, narrower flowers. Neither is as accommodating as their Eurasian kin, in my experience. *Gentianopsis barbellata* is found in the Front Range but seems to be especially abundant in the Mosquitos, blooming in September with its beautifully fringed, four-part flowers. This is the only one of the hundreds of species of gentians that has a sweet scent.

Oxytropis is a huge genus, particularly common in the steppes of Eurasia, with many very showy, usually compact perennial species. In North America the epicenter of the genus is definitely the Rockies. *Oxytropis campestris* var. *gracilis* has fine silver, pinnate foliage and small, light greenish-yellow clusters of flowers. *O. sericea* has dense clusters of white flowers that resemble hyacinths when seen from a distance, and silvery, fern-like foliage. For dry gardens there is *O. splendens*, with silky spires of hot pink and feathery, whorled leaflets that make it a dramatic element of subalpine meadows. *O. viscida* has bright blue and violet pea flowers on 8-inch (20-cm) stems over sticky mats of foliage. These are all extremely abundant in Middle Park and the surrounding limestone mountains, where they paint great pastel canvases of color in high summer.

Here and there in the clearings of montane woodlands, *Oxytropis multiceps* forms dense, flat rosettes of woolly foliage, topped by bright pink-purple flowers with woolly pink and white calyxes that inflate as the seed develops. This is not difficult to grow in a trough or well-drained scree. Not so, however, is *O. podocarpa*, with satiny purple flowers on ferny cushions and mottled, inflated seedpods—a great and challenging high-alpine cushion plant that resents hot conditions.

No family of plants is more widespread or abundant in the Rockies than the composites. *Machaeranthera coloradoensis* is a miniature aster that starts to bloom

in May, with repeated flushes of bright pink blossoms all the way to frost. Its dusty gray foliage is very attractive too. This does well in a scree, trough, or choice crevice in the rock garden. Clear pink daisies grow atop blue-green, toothed, curved leaves to 3 inches (7.5 cm).

Closely allied, the fleabanes (*Erigeron*) are amazingly abundant and diverse throughout the West, and nowhere more so than in the high Colorado mountains. Possibly the commonest, most widespread species is *Erigeron compositus* (photo, p. 22): compact silvery to green clumps of cut leaves, 1–3 inches (2.5–7.5 cm) tall and up to a foot (30 cm) across in vigorous lowland forms. You will find this everywhere in Colorado, extremely variable in leaf and flower. *E. compositus* ‘Red Desert’ is a tiny fleabane Bill Adams of Sunscapes Nursery introduced from seed I collected in crevices in isolated buttes of the Red Desert of Wyoming near Baggs, just north of the Colorado line. It is the most densely pulvinate and restrained selection of this extremely variable and widespread western daisy, and is superb in troughs. *E. pinnatisectus* (p. 22) has pinnate leaves and deep blue flowers, and is universal in tundra throughout the state, as is the huge-flowered *E. grandiflorus*. The very similar and much commoner *E. simplex* has become one of my favorites—a showy miniature from the Rockies with compact tufts of leaves and huge lavender blossoms up to 2 inches (5 cm) across, very adaptable in the rock garden. *E. vagus*, a compact cousin to *E. compositus*, is restricted in nature to high, moving scree in the Rockies and the Intermountain ranges; its foliage is densely hairy, and a constant succession of daisies is produced on low stems through the summer. It is easily grown in troughs. *Erigeron peregrinus* forms deep green mats and is extremely hardy and long-lived in the garden. It is seen everywhere in the lower alpine zones of Colorado, usually growing 8 inches (20 cm) tall and wide. It has bright lavender flowers throughout the summer months. *E. leiomerus* and the somewhat similar *E. ursinus* (p. 22) form dense mats of narrow leaves with a heavy show of lavender or bluish flowers in early summer. In nature they are restricted to the alpine meadows and scree of the Rockies, but both adapt well to rock gardens and troughs.

There are numerous lower-altitude fleabanes that have proven to be good garden plants, each with distinctive characteristics: *E. caespitosus*, *E. pumilus*, *E. nematophyllus*, and *E. vetensis* are all compact, xeric, white, pink or lavender daisies with narrow gray leaves with distinctive glandular hairs. They occur from low to mid altitudes in the southern Rockies. And there are many more flashy fleabanes wherever you look: as Tony Hall once observed, the Rocky Mountains should have been called the Daisy Chain!

Anyone who has seen “old man of the mountain” in the high tundra is not apt to forget the spectacle. *Hymenoxys grandiflora* (photo, p. 21) has 3-inch-wide (7.5 cm) yellow sunflowers on 6-inch (15-cm) stems that turn to follow the sun. It is monocarpic and sometimes a bit temperamental in the garden. *H. brandegei*, essentially a perennial *H. grandiflora*, comes from southern Colorado tundra and has only slightly smaller flowers, although a number can be produced on a single stem.

There are even a few shrubby composites found at high elevations, such as *Macronema discoideum* (syn. *Haplopappus macronema*), a low-growing shrub with

narrow grayish leaves and interesting soft yellow fringed disc flowers and a sweet, spicy scent. Likewise aromatic, orange-yellow *Tonestus pygmaeus* is one of the last daisies of the alpine summer; this Colorado endemic is rarely seen on seed lists. Deep green mats of short leaves develop quickly in our long growing season at lower altitudes. *Tonestus lyallii* seems commoner in the central mountains, a somewhat larger and showier plant. *Senecio* is one of the largest and most widespread genera of composites. *Senecio soldanella* is a glorious high alpine with deep purple leaves. A scree dweller with nearly sessile golden sunflowers, it is a challenge to grow, and harder to keep. *S. holmii* is related, but has toothed green leaves and nodding flowers that have a faint resemblance to daffodils.

Another dramatic native of this region, *Corydalis caseana* may be the largest plant in its genus. I have seen some that are well over 5 feet (1.6 m) tall, with masses of pink or white *Dicentra*-like flowers. It grows beside the cold subalpine streams of the West Elk Mountains, on Grand Mesa and along Wolf Creek Pass. It is virtually impossible to grow in hot-summer climates, however. Considering its size, most rock gardeners are probably relieved to hear that, although it would make a statement in the border.

The genus *Heuchera* has become extremely popular in shade gardens. There are a wealth of tiny species, however, that insist on growing among rocks. *Heuchera hallii* is a lovely alpine with creamy white bells to 8 inches tall (20 cm) above scalloped leaves in a bunched crown; it is found only on the Pikes Peak massif and southward. *H. parvifolia*, *H. bracteata* (photo, p. 21), and *H. nivale* are three tiny, chartreuse-flowered species that are rather less showy, but still very graceful wildlings worth growing in a collection. In western Colorado *H. rubescens* (p. 21) makes a striking appearance, with its frilly, pink bells. Closely related is *Telesonix jamesii* (back cover), a deep rose-red flowering saxifrage seen in its best form in Colorado. The form from the Middle Rockies has much smaller, more purple flowers. Also featuring super fall color, it is best cultivated in a crevice or container.

Every year for over a half-century I have explored more and more corners of my native state, and I never cease to be surprised by novelties. In 1975 Paul Maslin and I first found the brilliant scarlet miniature *Mimulus eastwoodiae* dangling from red cliffs near Delta, and another cliff out on the plains garlanded with 2-foot-long sprays of *Adiantum capillus-veneris*. I treasure memories of wandering through miles and miles of meadows and woodlands carpeted everywhere in June with millions of glacier lilies (*Erythronium montanum*) on Rabbit Ear's Pass.

But the richest store of memories by far is on the high ridges of the Collegiate peaks and the Mosquito Range that cradle Salida, where this summer's NARGS meeting will take place. High above Cottonwood Pass I first saw the minute alpine form of *Eriogonum umbellatum* var. *porteri*, and on nearby Cumberland Pass I found my first masses of bright purple alpine wallflower *Erysimum amoenum*. Weston Pass and Mt. Sherman continue to amaze me with their diverse floras; I have marveled at the abundance of alpine forget-me-not (*Eritrichium aretioides*) everywhere in these ranges, at the dense mats of *Draba*

oligosperma crowding the road to Horseshoe Mountain, and the tapestries of bright purple *Astragalus podocarpa* and hot orange-yellow *Physaria alpina* throughout these ranges. The intensely fragrant *Ipomopsis globularis* and the purple tufts of *Saussurea weberi* never cease to amaze me throughout these limestone ranges. Weston Pass is where I first found *Townsendia leptotes*. On the flanks of Hoosier Pass I first saw our local alpine poppy *Papaver kluanense*, the highly local Siberian thrift *Armeria scabra* ssp. *sibirica*, and the largest cushions I have ever seen of our glorious endemic alpine buckwheat, *Eriogonum flavum* var. *xanthum*—and much much more. I remember the orchids lurking along the streams, and occasionally stumbling upon the bright orange cups of *Lilium philadelphicum* in the woodlands.

I have been blessed to hike in mountains on five continents, but I have never seen floral spectacles to surpass the high tundra in Colorado in early July, with the kaleidoscopic blues of lupine, penstemon, and polemonium, the reds of castilleja and oxytropis, the myriad yellow and white tones of a dozen composites and cresses, all blended into a shimmering tapestry as far as the eye can see. You will not regret joining me and dozens of experienced guides from the Rocky Mountain chapter next summer as we glory in alpines on America's rooftop.

Panayoti Kelaidis is Senior Curator at the Denver Botanic Gardens and current president of the NARGS Rocky Mountain Chapter. He has introduced countless plants to the attention of rock gardeners and is a popular speaker in North America and abroad.

The Summer Flora of the San Juan Mountains

Charles Hipkin

Colorado is a lofty state, with huge areas of alpine tundra that support a distinctive mountain flora equal to any other in North America. Its borders enclose the heart of the Southern Rocky Mountains, where no fewer than 54 towering alpine peaks exceed 14,000 feet (4270 meters), making up the largest collection of sky-scraping mountains in the United States outside Alaska. The San Juan Mountains of southwestern Colorado contain about one-fifth of these “fourteeners” and comprise the largest regional mountain range in the U.S. Rocky Mountains. With over 10,000 square miles of mountain terrain and an average elevation of 10,000 feet, the San Juans offer a wilderness experience amidst a beautiful alpine flora. However, these rugged mountains, built of volcanic rock carved by ice, wind, and water, are not won easily, and they have been the subjects of few accounts in the alpine gardening literature. Gaining access to trailheads that take you into the range often involves traveling on rough, unsurfaced roads that require four-wheel drive and/or high clearance vehicles. Yet many people manage to penetrate far enough, even in passenger cars, to get a good start. Comfortable accommodation in mountain resorts such as Ouray, Silverton, Telluride, and Lake City will put you in the heart of these mountains and allow you to plan your hikes; and you can hire a jeep for the day if you’re concerned about taking your own vehicle to the trailheads.

In this account I describe some relatively easy excursions that can be made in the vicinity of Ouray and Lake City. Susan Komarek’s *Flora of the San Juans* is a very useful guide for the plant hunter here, but a copy of *Colorado Flora* by William Weber and Ronald Wittmann is essential if you want to get to grips with the region’s flora [though some of the plant names are idiosyncratic and not used by more recent authorities; *ed.*]. Volume 3 of the popular series *Colorado’s Best Wildflower Hikes*, by Pamela Irwin, describes 46 easy hikes in the San Juan Mountains for wildflower enthusiasts, but it is neither a flora nor an identification guide to the scientific names of plants. The names of plant species in the present article are, wherever possible, those given in the still incomplete *Flora of North America*. For species not yet covered there, I have used names given by Weber and Wittmann in the 3rd edition of *Colorado Flora (Western Slope)*. Since some of the

new names will be unfamiliar, sometimes I give older, more familiar ones in parentheses.

Ouray (elevation 7,800 feet), a town once famed for its lucrative silver mines, sits in the cool shadows of a box canyon, hemmed in by mountainous walls. From here the Million Dollar Highway (U.S. 550) climbs southward, up and over Red Mountain Pass to Silverton. The pass is a 14-mile drive from Ouray and offers a number of accessible opportunities for botanical exploration. A relatively short walk (about 4.25 miles round trip) along a jeep trail takes off from the west side of the highway about 0.5 miles below the pass and leads you above tree line to Bullion King Lake at 12,600 feet (3843 m) (photo, p. 23). In a jeep, you can drive a long way along the trail, but hiking is much more enjoyable and allows you to see much more. The best time to do it is probably in the second half of July, when most of the snow has melted into swollen creeks and marshy meadows. This hike is also included in Irwin's guide.

Even before you start hiking the trail, roadside meadows with little sunflower (*Helianthella quinquenervis*) and a distinctive, rayless butterweed with drooping, turban-like heads (*Senecio bigelovii*) will attract your attention. But once on the easy trail you'll be in a typical tall-herb subalpine community replete with distinctive umbellifers such as the yellow-flowered mountain parsley (*Pseudocymopterus montanus*) and the larger, white-flowered lovage (*Ligusticum porteri*) in the company of *Hymenoxys* (*Dugaldia*) *hoopesii*, *Veratrum californicum*, *Potentilla pulcherrima*, and *Zigadenus elegans*. The wetter meadow areas nearby support colorful populations of *Pedicularis groenlandica*, *Senecio triangularis*, and *Cardamine cordifolia*. There is also a bog orchid here with whitish-green flowers that identifies with *Limnorchis stricta* (or *Limnorchis saccata*) in the keys given by Weber and Whittmann or Komarek, but on reflection it may be closer to *Platanthera huronensis* as described in the *Flora of North America*.

As you get to timberline, the wet flushes are dominated by large expanses of the white marsh marigold, *Caltha leptosepala*, and creeks are bordered with clumps of *Primula parryi*. Pink-flowered *Allium geyeri* (photo, p. 24) is plentiful here, and little rock outcrops close to the trail are good places to look for the sprawling, white-flowered mats of *Arenaria lanuginosa* and the common Rocky Mountain wallflower, *Erysimum capitatum* (p. 24), which occurs here in both yellow- and lavender-flowered forms.

One of the special plants of these mountains is *Besseya ritteriana* (photo, p. 17), a distinctive species with creamy-yellow flowers, which is endemic to timberline areas in the San Juan Mountains. It's a larger plant than the much more widespread *Besseya alpina* (p. 17), and if it's in flower, you'll have no trouble finding it in meadow communities near the trail. You'll also be drawn to the outstanding clumps of *Castilleja rhexifolia* in contrasting white and magenta-pink forms, and in the vicinity of melting snow patches you'll find *Ranunculus macauleyi* (p. 25), a compact alpine buttercup, easily identified by the long dark hairs that clothe the underside of its sepals.

The rocky alpine tundra near Bullion King Lake is easy to explore. White, starry-flowered mats of *Minuartia macrantha* are found scattered here among tiny

clumps of *Draba crassifolia* and *Androsace septentrionalis*, along with other distinctive Southern Rocky Mountain species such as *Micranthes (Saxifraga) rhomboidea*, *Noccaea montana* (syn. *Thlaspi montanum*), *Oreoxis bakeri*, and *Chionophila jamesii*. The much rarer San Juan endemic *Draba graminea* (photo, p. 25) is also found here.

A trip to Yankee-Boy Basin is an opportunity to experience a more remote area of the San Juans. To get there you have to take county road 361 off U.S. 550 just south of Ouray. This dirt road degenerates severely after about 6 miles and, depending on your vehicle, common sense will usually tell you when to stop! Most vehicles will at least manage to get to an elevation of about 10,500 feet. Yankee-Boy Basin is famed for its wildflower displays and its access to Mt. Sneffels (14,150 feet), the highest fourteener in the San Juans. It also provides access to Blue Lake Pass, an area of truly outstanding beauty. Once again you'll find *Besseyia ritteriana* and *Draba graminea* in these areas, along with photogenic mixtures of tall-herb meadow species such as *Aquilegia caerulea*, *Delphinium barbeyi* (photo, p. 26), *Geranium richardsonii*, *Erigeron glacialis*, *Hymenoxys hoopesii*, and *Helianthella quinquenervis*. In the vicinity of Blue Lake Pass, old-man-of-the-mountains (*Hymenoxys grandiflora*; photo, p. 21) occurs in spectacular drifts of shaggy yellow sunflowers in short-grass alpine meadows set in an inspirational mountain landscape.

The Blue Lakes area can be accessed more easily from the little town of Ridgeway, about 11 miles north of Ouray. Head west on CO 62 from Ridgeway for about 5 miles, then south on county road 7 (Dallas Creek Road). After about 2 miles, take Forest Road 851 for about 9 miles and stop in the parking area (bring insect repellent!). Along the way you'll get some nice views of Mt. Sneffels. Take the Blue Lakes Trail through the forest, where you'll see white violets belonging to the *Viola canadensis* group; in the *Colorado Flora* key, they identify with *Viola rydbergii*. Amid a plethora of other common montane species you'll also see elegant *Mertensia franciscana* with *Mitella stauropetala* and *Draba halleriana*, while *Arnica cordifolia* and white-flowered *Erigeron coulteri* saturate woodland glades dappled with sunshine. After about 3 miles, as you approach Lower Blue Lake, wet meadow areas with abundant *Trollius albiflorus* will draw your attention. As the trail climbs up above the lake, the beautiful, flower-rich tall-herb meadow on your right with conspicuous stands of *Lupinus argenteus*, *Valeriana capitata*, *Delphinium barbeyi* (photo, p. 26) and *Geranium richardsonii* will compete for your attention with the compelling population of *Penstemon harbourii* (photo, p. 26) in the boulder scree on your left. *Penstemon whippleanus* and *Penstemon hallii* (p. 20) are far more common in these mountains.

By now, you may be thinking "It doesn't get better than this," but you haven't been to American Basin yet. The most convenient base for that would be Lake City or the nearby resort at Lake San Cristobal. First, call into the Lake City Visitor Center and get yourself a copy of Lyndon Lampert's little book *Lake City Hiking* (a compilation of hike descriptions first published in *The Lake City Outdoor Journal*), which describes 18 trails of varying difficulty that you can take in the vicinity. To get to American Basin from Lake City, you have to drive along the



A snow-fed rivulet on Mt. Sherman is lined with moisture-loving plants including white *Cardamine cordifolia* and blue *Mertensia ciliata*. (p. 4; photo, Connie Olson)

Besseya is a characteristic genus of the Colorado Rockies.

Left, *B. alpina* (pp. 5, 15; Panayoti Kelaidis); right, *B. ritteriana* (p. 15; Charles Hipkin)





View at Cottonwood Pass, one of the hikes offered at the 2010 annual meeting. (p. 5; photos, Connie Olson)

Smelowskia calycina var. *americana* at Cottonwood Pass (p. 5, 34).





Independence Pass rises above 12,000 feet and will host another 2010 field trip. (p. 5; photos, Connie Olson)

On the way to Weston Pass and its alpine gems (p. 7).





Penstemon hallii will be seen on the 2010 field trips. (p. 9; photos, Connie Olson)

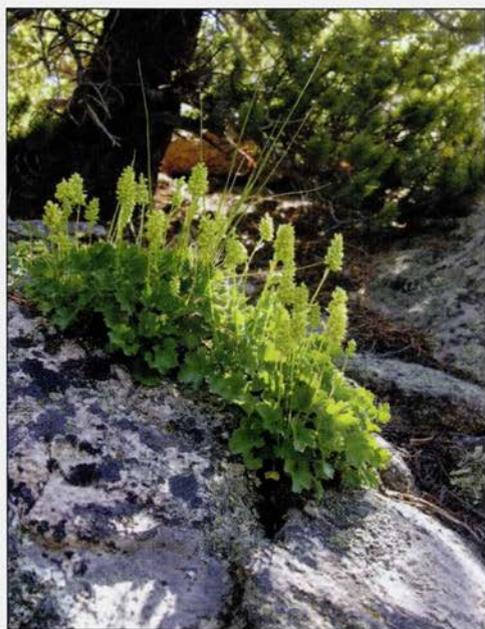
Lesquerella alpina is a showy crucifer restricted to limestone substrates in the Rockies. (p. 9; photo, Panayoti Kelaidis)





Hymenoxys grandiflora, the “old man of the mountains,” is a brilliant favorite with Colorado visitors. (p. 11, 16; photo, Cathy King)

More subtle beauties of the Colorado mountains include *Heuchera bracteata* (left; p. 12) and *Heuchera rubescens* (right; p. 12). (photos, Malcolm McGregor)





Fleabanes are widespread and varied in Colorado. Above, *Erigeron pinnatisectus* (pp. 6, 11, 33; photo, Connie Olson); below left, a ray-flowered form of *E. compositus* at the Denver Botanic Gardens (p. 11; P. Kelaidis); below right, *E. ursinus* (p. 11; P. Kelaidis).





Bullion King Lake lies at 12,600 feet elevation in the San Juan Mountains.
(p. 15; photo, Charles Hipkin)

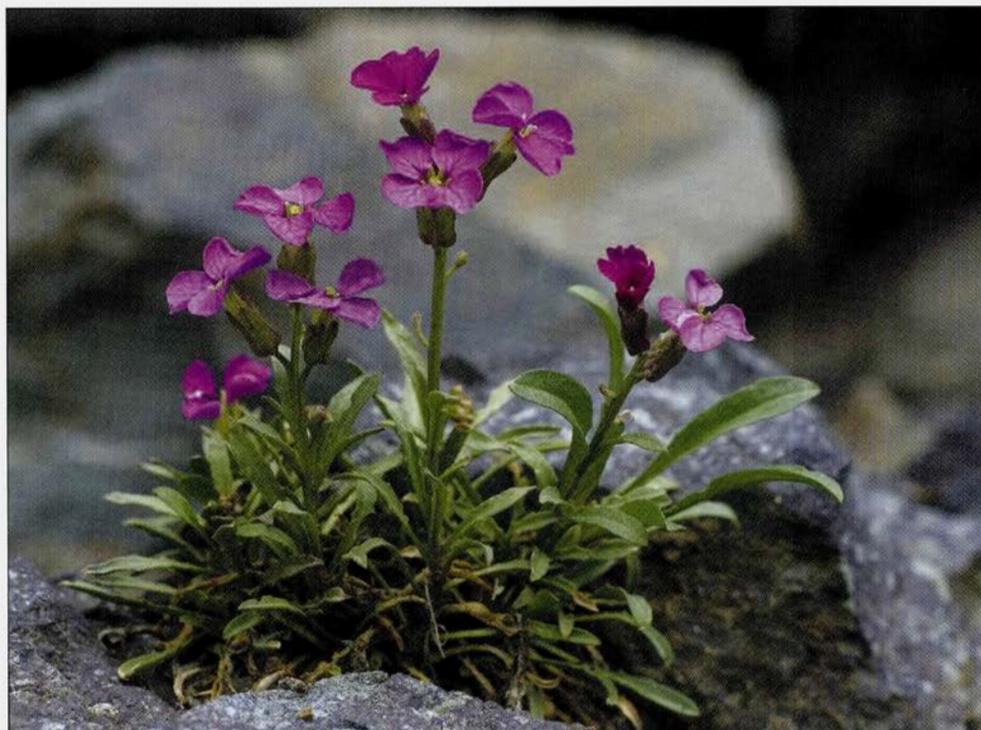
Mimulus tilingii can be found by streams and lakes in the Rockies. (photo, Connie Olson)





Allium geyeri near the Bullion Lake trail, San Juan Mountains. (p. 15; photos, C. Hipkin)

Lavender form of the alpine race of *Erysimum capitatum* near the Bullion Lake trail. (p. 15)





Ranunculus macauleyi near the Bullion Lake trail, one of several brilliant Rocky Mountain buttercups that flower at snowmelt. (p. 15; photos, C. Hipkin)

Draba graminea, an endemic species in the San Juan Mountains. (p. 16)





Delphinium barbeyi in Yankee Boy Basin, San Juan Mountains.
(pp. 9, 16; photos, C. Hipkin)

Penstemon harbourii near Lower Blue Lake, San Juan Mountains. (p. 9, 16)





American Basin in the San Juan Mountains holds unsurpassed alpine meadow displays, dominated here by *Aquilegia caerulea*. (p. 33; photos, C. Hipkin)

Phacelia glandulosa by Cinnamon Pass Road near American Basin. (p. 33)





This trough at the Denver Botanic Gardens was planted by Gwen Moore Kelaidis with species from the San Juan Mountains. The DBG trough garden will be on display at a reception preceding the 2010 annual meeting. (photo, Panayoti Kelaidis)

A raised sand bed constructed and planted by Tim Ingram in Kent, England. (p. 35; photo, T. Ingram)





A *Dasyliion* species combines well with an *Origanum* decked with rosy bracts in the dry sand bed. (p. 36; photos, Tim Ingram)

Two irises that flourish in the dry sand bed are 'Clairette', a *reticulata* hybrid (left), and the Juno species *Iris aucheri* (right; p. 37).





Choice plants in an English sand bed include brilliant *Polygala calcarea* 'Lillet', (above; p. 36), and *Campanula* cultivars 'Hilltop Snow' (left; p. 35) and 'Puck' (right; p. 35). (T. Ingram)





Views of Larry Thomas's balcony garden high above Manhattan (p. 39; photos provided by members of the Manhattan Chapter).





Larry Thomas's balcony garden is hospitable to both plants and plant-lovers (p. 39).



perimeter of Lake San Cristobal and take the road to Cinnamon Pass. I've seen passenger cars on this road, but most sane people would take an SUV with reasonable clearance or a jeep. After about 10 miles the road becomes quite rough, but tolerable at low speed. En route, you have to drive along what Lampert describes as "the notorious Shelf Road," which is not as bad as it sounds but is an interesting experience. After about 4 miles you'll reach the Grizzly Gulch/Silver Creek trailheads, which give access to Handies Peak (14,048 feet), Redcloud Peak (14,034 feet), and Sunshine Peak (14,001 feet). There's a relatively large parking area here, and exploration along the attractive Grizzly Gulch Trail is well worth your while. Even a short excursion here will reward you with a good collection of attractive subalpine fleabanes, such as the beautiful *Erigeron formosissimus*, *Erigeron speciosus*, *Erigeron elatior*, *Erigeron ursinus* (photo, p. 22) and *Erigeron glacialis* (*E. peregrinus* subsp. *callianthemus*), and two rayless species, *Erigeron compositus* and *Erigeron acris* var. *kamtschaticus*. Many people pass these by as generic "daisies," but they are all distinctive species and important contributors to the diversity of these mountain meadows. *Erigeron leiomerus*, *Erigeron pinnatisectus* (p. 22), and *Erigeron vagus*, none of which would look out of place in any rock garden, are also found in these mountains at higher altitudes on rocky ridges and alpine tundra.

One of the best early summer hikes in the San Juan Mountains is to walk the Grizzly Gulch trail to the summit of Handies Peak and then descend the other side into American Basin. Your reward would be a comprehensive taste of the San Juan flora and some awesome scenery. Otherwise, you'll take the more popular option and drive further along the Cinnamon Pass Road to get closer to American Basin. Although this section of the journey is not for the faint-hearted, with care most people get to within a reasonable hiking distance to the basin. Look out for the attractive (but unpleasantly scented), purple-flowered *Phacelia glandulosa* (photo, p. 27) at the side of the road, a magnet for pollinating bees.

Whether you're on foot or in your vehicle, you will reach a fork in the road where you leave the Cinnamon Pass Road and go left into American Basin (photo, p. 27). Assuming you're there at the right time, draw breath as you gaze upon one of the most amazing mountain meadow floral communities in North America. Listing the flora almost seems irrelevant: there's not much more in the way of names that you won't have seen elsewhere in these mountains. It's the sheer spectacle of vibrant color and abundance that will knock you out, like acres of Victorian perennial border: the yellows of *Arnica mollis*, *Senecio triangularis* and *Hymenoxys hoopesii*, dark blue spires of *Delphinium barbeyi*, red *Castilleja*, white and pastel pink *Geranium richardsonii*, white umbrellas of *Ligusticum porteri*, the occasional saffron-orange heads of *Packeria crocea*—and if you've ever seen a bigger and better display of Colorado columbine (*Aquilegia caerulea*) in a single span of human eyesight, you've been very lucky.

If you can drag yourself away from this, follow the trail up into the basin and beyond. As you climb further, the magenta blooms of subalpine *Castilleja rhexifolia* are replaced by the more alpine *Castilleja haydenii* and yellow *Castilleja occidentalis* at about 12,000 feet. One of the sky pilots, *Polemonium confertum*, will also be

seen here. It's very similar to the more familiar *Polemonium viscosum*, which is abundant further along the trail near the summit of Handies Peak, but the tubular portion of its flower (the corolla) is much longer than the green sepals that enclose the flower, and the mouth of the flower flares out much more. The two species will hybridize with each other, but populations in this part of the San Juan Mountains do seem to be distinctive. Higher still, large amounts of *Rhodiola (Sedum) integrifolia* and the ubiquitous *Geum (Acomatstylis) rossii* and *Bistorta bistortoides* are conspicuous, but above 12,500 feet, natural rock gardens with species such as *Chionophila jamesii*, *Claytonia megarhiza*, *Erigeron melanocephalus*, *Erigeron grandiflorus*, *Minuartia (Lidia) obtusiloba*, *Potentilla subjugens*, *Saxifraga adscendens*, *Saxifraga flagellaris*, *Silene acaulis*, and an attractive pink-flowered form of wild candytuft (*Noccaea montana*) become more evident. The parsley-like Colorado endemic *Podistera eastwoodiae* also occurs here in distinctive snowmelt communities. Approaching the summit of Handies Peak, you'll find the apparently barren, scree-dominated terrain to be populated with scattered plants of *Draba crassa*, *Polemonium viscosum*, and *Smelowskia calycina* (photo, p. 18). And from the summit, a panoramic view will fill you with awe and wonder at the alpine wilderness around you, mostly unexplored for all the botanical treasures it contains.

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An English Sand Bed

Tim Ingram

I first read about sand beds as a way of growing more choice alpinists in the illuminating book *Rocky Mountain Alpines* (the proceedings of the conference “Alpines ’86”). Here was such a simple and economical way of providing conditions for plants that prosper less well in the traditional alpine bed that it firmly lodged in the back of my mind. Few ideas are new, and references to sand gardening can be found in early editions of the *Alpine Garden Society Bulletin*. However, it has never been widely taken up as a way of growing choice alpinists, and it is difficult to see why not. Of course, the various ways of growing alpinists are often very similar. Thus, sand beds in many ways resemble screes, though the former are much lower in nutrients and more uniform in texture. The latter are more sophisticated and visually attractive, and very often are associated with rocks and more extensive alpine gardens. The increasingly popular crevice gardening style, so wonderfully expressed in the Czech Republic, is almost the perfect way of growing many alpinists but for the cost and skill involved. Sand gardening, though, is first and foremost economical—and second, easy! For less financially advantaged gardeners who want to make the most of their resources it has great appeal, and for certain groups of plants it provides the most effective means of cultivation.

My first sand bed occupied the end of a shallow raised bed and used a mix of sand and stones (“builder’s ballast” for preparing concrete), with a little peat mixed in, and ashes from the bonfire to add inorganic nutrient. This was only some 10 by 5 feet (3 by 1.5 m) in extent but grew an exciting range of plants. The other end of the bed was more traditionally made with loam, peat, and coarse grit, and the whole structure was covered from the end of October to March.

Into the sand went plants from dry mountain ranges such as the Rockies, parts of Turkey, the Balkans, and elsewhere (photos, p. 28–30). As others have found, many plants such as eriogonums grew tight and in character; a particular success was the Mediterranean *Convolvulus boissieri* with its shining silvered leaves. From South America comes the diminutive *Alstroemeria hookeri*, which readily produced its disproportionately large pink flowerheads on stems only a few inches high. Unusual shrublets like the cruciferous *Vella spinosa* from Spain

made an excellent show. Deeply tap-rooted alpinines such as *Catananche caespitosa* with short-stemmed yellow flowers are well suited to sand, as is *Asphodelus acaulis*, which in richer soil can hide its early pink flowers within its leafage. Both of these plants hail from the Atlas Mountains in Morocco, a fascinating Mediterranean outpost of choice plants for the dry rock garden. Other plants in the bed included several of the Mexican phloxes (for a short time), several lewisias (though these really needed richer fare), and *Silene hookeri* and a number of penstemons; these last did less well than I expected, often suffering from partial dieback in our uncertain and sometimes humid summers.

A larger-scale bed was clearly indicated. I made the new bed at ground level after excavating a good spade's depth of soil, to create something more akin to a scree. Our climate in southeast England is relatively dry (c. 25 inches / 60 cm annual rainfall) and warm, and my hope was that the sand would maintain reasonable levels of summer moisture by translocation from the surrounding soil, a well-drained but rather heavy loam. Even so, in long dry spells some irrigation was needed, especially for the shallow-rooting plants. This bed was initially left uncovered over winter. However, a number of plants "went back" in long, cold, wet spells, and so I now cover the bed for the winter months; I'd advise this with any sand bed unless the climate provides persistent snow cover or is winter-dry. In my case the "sand" used was a very fine crushed flint, and in retrospect this may have been less suitable than sharp sand or ballast, the latter holding more summer moisture by capillary action. However, many plants have done well, even though often establishing slowly and showing their true worth only after a season or two.

The bed is dominated by a number of specimens of *Dasylyrion* (photo, p. 29; obtained from Yucca Do Nursery) and a magnificent clump of the Californian *Yucca whipplei*, which has just sailed through one of the coldest winters we have had for decades. Though not traditionally plants you might associate with alpinines, they suit the conditions very well. A few dwarf daphnes have done less well, and I think they need a much deeper top-dressing of coarse gravel and more nutrition. The New Zealander *Raoulia australis* has spread strongly, rather swamping a number of smaller and choicer plants. In the wild some of these "scabweeds" grow in fine gravel in relatively dry mountain valleys, unlike many other New Zealanders that require much moister conditions. Surprisingly, various forms of the Himalayan *Androsace studiosorum* also grow well, despite their shallow "strawberry" rooting habit. A number of other androsaces have settled down, though they probably prosper better in cooler and moister parts of Britain. *Dianthus* are particularly well suited to dry sandy soils, and species such as *D. erimaceus* and *D. haematocalyx* make tight clumps. The beautiful blue *Polygala calcarea* 'Lillet' (photo, p. 30) grows slowly and flowers very well. Alpine campanulas, so ably championed by Graham Nicholls, are mostly very well adapted to poor sandy soils and much less at risk therein from attack by slugs and snails. Their relatives in the genus *Edraianthus* also make nice plants in sand. Many crucifers are well adapted to these conditions, the finest probably being *Degenia velebitica*, a rare plant of the Velebit Mountains in the Balkans, which has short-

stemmed and relatively large flowers of soft yellow. I am also trying species of *Lesquerella* and *Physaria* from the Rockies.

The Ranunculus family, a clan of many moisture lovers, also provides a number of much more drought-tolerant plants that do well in sand. The choice *Callianthemum anemonoides* has settled down, flowering early in the year followed by a compact clump of finely cut leaves. Dwarf columbines like *Aquilegia scopulorum* and *A. bertolonii* have deep-questing roots and adapt well to sand, often self-sowing freely. The beautiful *Clematis tenuiloba* (now included in *C. columbiana*), so highly praised by Claude Barr, has begun to run around and flower gently. Its foliage contrasts nicely with many of the cushion plants. However, *C. hirsutissima*, despite growing happily, refuses to flower for me. Possibly it requires more summer heat to set flower buds, and the same may be true for the fascinating Turkish *Pelargonium endlicherianum* and *Acantholimon* species, both of which otherwise are ideal for sand beds. The former flowers freely and sets seed in the alpine house. I would like to establish some of the choice Turkish species of *Veronica* such as *V. caespitosa*, though so far have not found these easy. The problem can sometimes lie in the type of compost nursery plants are grown in (especially if rather peaty), though I do not normally wash the roots before planting, reasoning that the fine sand will facilitate transfer of moisture to the rootball of the plants. The underlying loam of the bed was not separated from the sand by a membrane during construction and will slowly be incorporated into the sand by earthworms, providing nutrients particularly to the deeper-rooting plants.

Most commonly cultivated bulbs are adapted to more fertile soils. However, I have tried a few in the sand bed to provide contrast with the carpeting and cushion plants. In general these have been chosen for their diminutive stature in order to associate sensibly with the other plants. A lovely variety of *Iris reticulata* called 'Clairette' (photo, p. 29) has done well and flowers very early in the year. This form has pale blue falls, tipped dark violet, and I have not found it persistent elsewhere in the garden. Among the Juno irises, which have a storage bulb and roots, *Iris aucheri* (photo, p. 29) is especially showy. Several dwarf *Muscari* species, including *M. discolor* and *M. mcbeathianum*, have settled down and are infinitely better behaved than their common garden cousins. I like them for their very different form. A number of dwarf narcissi also flower early in the year, and some *Calochortus* have been tried for later summer color, with mixed success. From South Africa comes the diminutive *Eucomis schiffii*, a delightful species from the Drakensberg, KwaZulu-Natal and Lesotho. This forms flat rosettes of blue-gray leaves and short 4–6 inch (10–15 cm) spikes of of purplish flowers late into summer, providing interest when many of the other plants have finished flowering. So far this *Eucomis* has proved reliably hardy and tolerant of winter wet in deep sand.

Having seen the rustyback fern, *Ceterach officinarum*, growing in walls so well, I have also tried this in the sand with good success. This plant is a good indicator of drought, curling its fronds when stressed but recovering well after watering, which will benefit all of the other plants in the bed too. Maidenhair spleenwort, *Asplenium trichomanes*, also prospers. I would like to try some *Cheilanthes*, but most

are borderline hardy in our climate. I shall try more xerophytic ferns as they become available or can be grown from spores; they contrast very well with the other plants in the bed.

This particular sand bed is only some 150 square feet (c. 10 square meters) in extent and yet houses some 150 different plants! There are very many other species that I would like to try and the bed is due for expansion. Cheap and easy the sand bed may be, but as others have said before, it provides endless pleasure and can be highly recommended to all alpine gardeners who would like to extend their repertoire.

Note: Sand beds are increasingly popular in North America, where Rick Lupp has created a wonderful display of them at Mt. Tahoma Nursery near Seattle. David Sellars of British Columbia wrote about his experiences with them in our fall 2008 issue (66:274–276).

Tim Ingram gardens in Faversham, Kent, England, in a climate that corresponds roughly to North American Zones 8–9.

Rock Gardening on a Balcony

Lawrence Thomas

For those who aren't blessed with the space to create an in-ground rock garden, there is an alternative: contained gardening. Think small—but in a big way. I garden on an eleventh-floor, 13 by 40-foot (3.9 by 12 m) terrace in the heart of Manhattan (photos, pp. 31–32). The long exposure faces east and the short south, which gives the terrace full sun from sunrise until mid-afternoon. This exposure effectively protects the terrace from the prevailing northwesterly winds, a major consideration for this type of gardening. Some terrace or balcony gardeners, particularly those with southern or western exposures, find heat build-up to be a problem. Late-afternoon sunshine can both overheat and burn plants. Makeshift shade of some sort, usually a canopy, is then a necessity. Other gardeners with exposures similar to mine have trouble with wind. This must be dealt with, usually with hedge windbreaks to deflect strong prevailing winds. If you know you want a balcony garden, try to find an apartment with an eastern exposure and in the lee of the building.

The flooring of my terrace consists of 1-foot (30-cm) square concrete blocks mounted at each corner on plastic supports that elevate the blocks off the underlying waterproof membrane. Although the building is constructed of steel and concrete, there are restrictions that require that the weight of any large planter box be spread evenly over several blocks. Because all large containers must be elevated 2 inches (5 cm) above the deck, sections of 2×4 lumber serve well. Elevating the containers also protects the underlying roof from invasive roots. Don't forget, you are responsible for any leaks below. (If that doesn't cause a shudder or two, you're not cut out to be a terrace gardener.)

Everything I grow is in planter boxes, troughs, pans, or pots. There are virtues as well as drawbacks in such gardening constraints. Many choice alpine plants, once taken away from their rigorous native habitats, adapt better to life in containers than in the open ground. You can customize the growing situation to cater to each plant's basic needs, manipulating the size and depth of the container and specifics such as soils and microclimates. You can also protect vulnerable gems such as *Campanula zoyzii* from the predators that bedevil ground-level gardeners. No deer, and few slugs and other critters! Landed gardening friends will envy the apartment dweller for that.

Alpines are tough little high-mountain plants that have adapted to rigors of wind, solar radiation, and exposure that would kill many other plants; yet, if you can meet their basic needs, many alpines adjust readily to lowland conditions—slumming, as it were, with their lowland kin. Knowledge of the plant's growth habit and native conditions is essential, requiring some homework on your part. Choosing the proper container requires some thought. Some plants have very small, shallow root systems; others have long, fibrous roots that can run several feet in rocky crevices. Hence, the size of the container is important. Overpot an alpine primula, for instance, and it simply will sit and sulk, whereas choice campanulas require deeper pots (the English call them “long toms”) for their extensive root runs, and they still need to be repotted every other year.

Don't crock your pots with shards as older books often recommend: this merely encourages ants, slugs, sowbugs, and similar pests to take up residence. Instead, use wire or plastic screen mesh, which keeps the pests at bay and also ensures the good drainage crucial to success with these “miffy” plants.

A standard soil mix should incorporate at least 50% grit (such as poultry grit or aquarium gravel) to promote quick drainage and allow sufficient oxygen to reach the roots. This is critical: alpines drown quickly in soggy soil. Most lime-loving plants adjust to acid soil, but the converse is not true. Acid-lovers such as rhododendrons are likely to fail in alkaline soil, so be sure your grit is not limestone. Once again, container gardening provides an easy solution. Simply tailor the soil to the plant's needs. Check your pots periodically and renew the soil as needed, adding compost, leafmold, or peat to rejuvenate it. Most campanulas respond to this, because they exhaust the soil after a year or so.

When planting, it is wise to bare-root most new plants by dipping them repeatedly in water, rolling the roots in sand, and replanting in your own soil medium. They'll establish more quickly, and removing the soil prevents the introduction of slug eggs, grubs, and weevils that sometimes arrive in nursery soil. Top-dressing with gravel, turkey grit, or a fired clay product such as Turface benefits the plant by keeping its crown dry, something many alpines appreciate; it also adds a decorative touch.

Establish a regular watering and fertilizing schedule. Learn to tell when a plant needs water by hefting the pot and feeling its weight. In a terrace or balcony situation, most clay pots require daily watering, particularly in summer; plastic pots are less likely to need such frequent watering. Fertilize regularly (every two or three weeks) during the active growth season with a quarter-strength dose of soluble fertilizer. I normally use a popular chemical fertilizer with a 20-20-20 formula, and sometimes I supplement this with a smelly but highly effective organic fermented fish fertilizer in a 1.4-0.2-0.2 formula. (An exception is penstemons in pots, which need only one weak dose early in the growing season.) Stop fertilizing in late summer to give the plants an opportunity to harden their new growth before the onset of frost.

When I first began terrace gardening 40 years ago, soft coal and oil with high sulfur content were the main fuels for our power plants. This made city gardening—even city living—a particularly dirty business. Because these fuels have been

phased out in favor of natural gas, the situation has changed dramatically. Still, as part of my daily watering routine, I spray all my plants, giving them a daily shower. Besides minimizing pollution effects, this helps cut down on insect predation.

Some plants need a bit of winter protection—not from the cold, but from moisture. Plants such as dryland ferns or *Campanula raineri* should be kept dry from first hard frost until they break into active growth in the spring. Putting them under a potting bench, shelf, or table should suffice.

Hypertufa troughs are ideal containers for terraces and balconies. Their medium effectively reduces the weight of the container while strengthening it. Raised on upended cinder blocks, troughs become the focal point of any terrace garden, and most alpiners and rock garden plants thrive in them. Adding sizable chunks of tufa or other rock can simulate natural outcrops and provide the crannies and crevices many alpiners love.

A real virtue of container gardening is portability. You can stage-manage your terrace by shifting containers to display whatever has star power at the moment. You also can screen specimens that have bloomed out behind other plants, or confine those that predators have chewed to sick bay for recuperation. And in the unlikely event that something actually dies, you can quickly suppress the sad event and fill the gap.

One of my gardening friends says, with much truth, that we city folk garden in spite of the odds. Everything conspires against us, yet we labor on, determined to tame the asphalt jungle with our patches of civilized greenery. Our breed are natural-born scavengers, accustomed to making do with whatever is at hand. If that means picking it up on the street, so be it. Some of our best finds are street finds—road kill, somebody else's trash—that we just can't pass up. Some friends found a splendid antique lead planter sitting on the street waiting for the trash collector. The fact that they were on their way to a formal reception was no reason to pass up such a treasure, so, dressed to the nines, they walked home lugging what became the centerpiece of their terrace garden.

Obtaining supplies is often a problem in the city because prohibitive rents have driven most nursery or garden supply operations out to the suburbs. Without a car, the problem is compounded. Hence, suburban friends and their autos are often pressed into service to help the urban gardener truck in heavy bags of topsoil, sand, grit, peat, leafmold, and manure, containers, and plants. You name it, we covet it and we tote it up the stairs, or, if we're lucky, in a service elevator. If you're not so lucky, be prepared for neighborly sniffs and snubs when you conscript the front elevator to transport your horticultural necessities.

Soil, of course, is the backbone of gardening, and the terrace gardener quickly becomes expert at recycling precious soil again and again, repeatedly enriching it with whatever he can scrounge. One gardening friend attributes his considerable success with alpine clematis solely to the beech leafmold he gathers furtively in Manhattan's Central Park. Another hounds his neighbors into saving scraps—garbage, mind you—which he takes regularly to a local green market, where they are composted and returned to him as rich black gold, the ideal soil enhancement. A compost pile may be a given for most gardeners, but the urban terrace

gardener must improvise in any way possible. The same is true of such niceties as bulb or cold frames, for which there simply isn't room. As a substitute, I've begun using the heavy-walled Styrofoam containers in which frozen meat is shipped, covered with frosted glass salvaged from the vegetable crisper of a discarded refrigerator. This make-do cold frame has worked beautifully for wintering over tender bulbs and plants that require protection from winter wet. Such measures may amuse the in-ground gardener; for us aerial alpinists, they are a way of life.

The Broadway moppet Annie sings, "It's a hard-knock world." Any terrace gardener can respond to that, for ours often seems a strictly uphill climb. Still, the red-headed orphan also offers us the promise of "Tomorrow," to which any gardener worth his tilth would agree. The pessimists may say gloomily, "You should have seen it last week," but for us optimists, there's always next week.

Larry Thomas, a retired magazine editor, gardens in the alpine zone of New York City. Founding chairman of the Manhattan Chapter of NARGS, he has written and lectured extensively on container gardening. This article is reprinted from *Rock Garden Design and Construction*, co-published by NARGS and Timber Press in 2003, in honor of Larry's receiving the 2009 Lincoln and Timmy Foster Garden Award in the "Special Gardens" category. The photographs accompanying this article were submitted with the nominating package prepared by Michael Riley, Abbie Zabar, Lola Lloyd Horwitz, and Steve Whitesell.

A Bottle-Pot for Seed Germination and Rooting Cuttings

Maurice Farrier

A 2-liter plastic bottle can be made into an inexpensive self-watering pot helpful for amateur gardeners. I read about this in "Wicked Wonders" by Rebecca and Michael Taylor (*National Gardening* magazine, Nov.-Dec. 1992, p. 63). Since then, I improved the design by adding a second 2-liter bottle as a humidity hood and have used the devices to germinate more than 302 packets of perennial seeds from 60 genera. By replacing the seedling mix with a rooting mix, I rooted cuttings of more than a dozen species. The bottle-pot was especially helpful when starting seeds having a long germination period or requiring cold stratification. (Editor's note: Measurements in this article are in the old British system still used in the United States, and owing to the many instances have not been "translated." 1 inch = 2.5 cm.)

Supplies

Gather the following: Two-liter drink bottles (with their caps; nonmetallic window screen; synthetic (not cotton) knitting yarn; short, big-headed galvanized roofing nails (two per pot); a plastic rectangular dishpan or similar container; fluorescent light with 2 tubes (cool white, also called "Residential"); a piece of paper, about 3 inches wide, with a straight edge and at least 16 inches long to aid marking for the initial cut; a 12-inch length of 2×2 board, slightly rounded to approximate the inside curvature of the bottle, to be used as backing when drilling the holes; and masking or Scotch tape to secure the paper straight-edge to the bottle. You'll also need the following tools: a utility knife (box cutter); scissors; marking pen; brad-point drill bit ($\frac{1}{8}$ inch diameter); a twist drill bit ($\frac{1}{8}$ inch diameter); and an electric drill (reversible).

Making the Bottle-Pot

Two- or three-liter bottles may be used. The 2-liter are more readily available and six of them fit snugly in a typical plastic dishpan. Caps will be needed for the

hood but not for the pot. Soak off the label, then measure and mark the side 5 inches from the top. Wrap the straight edge of the paper around the bottle at the 5-inch mark. Tape it to the bottle and mark along the edge of the paper. Cut on the line with the utility knife. When assembled, the uncapped top of the inverted top section will mark the normal fill level for the water chamber, thus serving as a "fill-ring." Keep each top and bottom associated as bottle sizes may vary. Using the $\frac{3}{8}$ inch brad-point bit, drill (in reverse, to reduce tearing) the fill-hole 1.5 inches to the center below the top edge of the bottom section.

Invert the top section and place it snugly into the bottom section and level it. In forward (clockwise) mode, drill $\frac{1}{8}$ -inch holes approximately opposite each other through both sections and insert the nails to secure them. Should the assembly while in use be lifted without the nails holding it together, the bottom section may drop to the floor and act as a military mortar, shooting water up over the gardener!

Cut the screen fabric into 1.5-inch squares, roughly round the corners, fold each square twice and nip out the center hole for the wick. To make the wick, cut a 7-inch length of knitting yarn, knot it one inch from the end, and unravel the short end slightly to give better contact with the growing mix. Thread the long end through the screen hole and drop it through the neck of the inverted bottle. If you reuse the device, always supply a new wick.

The capacity of the upper chamber for the growing mix and the lower chamber for water (filled to the fill-ring) will be one pint each when made with 2-liter bottles. When the growing mix is filled to within $\frac{1}{2}$ inch of the top of the pot and the water is brought up to the fill-ring, the distance from the top of the growing mix to the water level will be 4.5 inches. This is within the 4- to 5-inch optimum parameters established 69 years ago by Kenneth Post in "Sub-irrigation of Seed Flats" (*Florists Exchange and Horticultural Trade World*, May 1941, p.16).

Making the Humidity Hood

Cut the second bottle at the 5-inch line as before. With scissors, make three cuts about $\frac{3}{4}$ inch upward in the bottom edge of this section, one in the back and two about $\frac{3}{4}$ inch apart in front to form a tongue with a lip on each side. Shorten one lip to ease placement of the hood over the pot. The cap should be in place for long germination periods but may be removed for conditioning the seedlings prior to complete removal of the hood.

Half-gallon milk or juice cartons made of paper may be cut and slipped over the hood if the seeds require darkness for germination or temporary protection from sun after germination. More light may be provided to the emerging seedling, if needed, by shortening the bottom section of the bottle used for the hood. With many plant species, the hood was removed when a few seedlings first appeared. Without the hood, the hazard of overheating was eliminated. The pots were then moved to the appropriate level of light. More frequent observation of the water level was necessary in more light and without the hood.

Soilless Mix for Seeds

The basic formula for germinating seeds that I have used in North Carolina is: 1 pint Metro-Mix 250, 1 pint pine bark chips, 1 ½ cups perlite. Over the period that I have used bottle-pots, bark-based soil conditioners have become coarser and more contaminated with raw, inadequately composted wood. Though more expensive, I may try half Metro-Mix 350 and half perlite when my supply of good bark chips has been used up. The perlite and bark chips regulate the water content in the mix—larger particles result in a drier mix. Most commercial potting mixes if used “straight” will become waterlogged after a while, resulting in seedlings rotting.

Rooting Mix for Cuttings

A potting mix of half perlite and half milled sphagnum (not sphagnum peat) by volume (see “Tips on Propagating Hollies” by Harold L. Elmore, in *Hollies, A Gardener’s Guide. Plants and Gardens*, Brooklyn Botanic Gardens Record 49 (2): 1-9, 1993, p. 33) has proven satisfactory so far. With the use of the hood and the consistent capillary feed, the mist system with its problems can be avoided. I keep some perlite-sphagnum mix on hand. When my wife comes home from garden club with a cutting that I am sure is crying “code blue,” I can grab an assembled bottle-pot, add the screen, wick, and rooting mix, establish capillarity and possibly save the poor thing.

Establishing Capillarity

Whether the bottle-pot is used for seeds or cuttings, a continuous capillary system must be established. At the first assembly, place the long end of the wick through the inverted bottle neck. Make sure the wick reaches to the bottom of the water chamber and that the screen will prevent the growing mix from dropping into the water chamber. Place 1 pint of soilless mix in the upper chamber. About ½ inch of the pot rim should remain above the surface of the mix. Fill the water chamber past the fill-ring to the level of the bottom of the fill-hole. This will submerge the growing mix in the neck of the bottle. Leave it to soak for about an hour or overnight. Level the surface of the mix by lightly spraying it. Slightly better results have been obtained by covering the unraveled end of the wick with pure Metro-Mix as a “bridge” between the wick and the growing mix.

The capillary system should not be permitted to dry out, especially when the seed are germinating. Should it dry out after the plants are up, sometimes capillarity can be reestablished by repeating the above procedures. Monitoring the water level periodically will prevent this. Normally, with the hood in place and no active plant growth, little attention will be needed for 2 or 3 months.

Sowing

After pouring off the excess water needed to establish capillarity and with the surface of the growing mix leveled, use a pencil point to open the “dibbles” for the seeds. I planted most kinds of seeds about $\frac{1}{4}$ inch deep, and large ones a bit deeper. When using this light seed mix and with humidity controlled, planting depth is not as critical as it would be in the open garden.

Generally, initial spacing of seeds was eight around the perimeter $\frac{1}{2}$ inch from the wall of the pot, with four in the central area. I closed the dibbles with a light spray of water and adjusted the final water level. If the seeds were very small or required light for germination, they were just pressed into the surface of the mix. For seeds requiring darkness, the bottle-pots were placed under the house or covered with cut-off inverted half-gallon milk or juice cartons.

Final Assembly

Identify the pot with a plastic label facing outward on the opposite side from the fill hole. Place the single slit of the capped hood at the label outside the pot rim and tip it forward. Then place the long lip outside with the tongue inside, and place finally the short lip outside. Set the completed pots in their pan or flat under the growing light with adequate clearance.

Pros and Cons

This system has a couple of disadvantages. When the humidity hood is in place, the pot must be shaded from direct sunlight to prevent overheating. Fluorescent lighting can be used to provide light without excessive heat. Further, a single bottle-pot is easily tipped over but can be stabilized by setting it in a square half-gallon carton base.

There are many more advantages, though. This device is relatively inexpensive and reusable, if cleaned. Little maintenance is required. The water level is visible, preventing over- or under-watering. It can be made hydroponic by adding soluble fertilizer to the water chamber. The system is particularly useful for seeds having long germination periods, or those requiring cold stratification, such as iris or roses. It's also adaptable for seed requiring darkness for germination. Water consumption is minimal after set-up. Seeds that are sensitive to pH can be germinated using rainwater or demineralized water, if tap water in your area is strongly alkaline. If the components are prepared ahead, then final assembly is quick when the seeds arrive. Finally, growing from seed can give you many plants at a small price, allowing planting in drifts or at several sites, with one or two hopeful successes.

This inexpensive gadget used in conjunction with plant society seed exchanges and patience has permitted me to view plants from around the world.

Without it, such pleasure, learning, and sharing with others would have been limited and expensive. Do not be discouraged by failures; learn by them. Enjoy.

Maurice Farrier gardens in Raleigh, North Carolina.



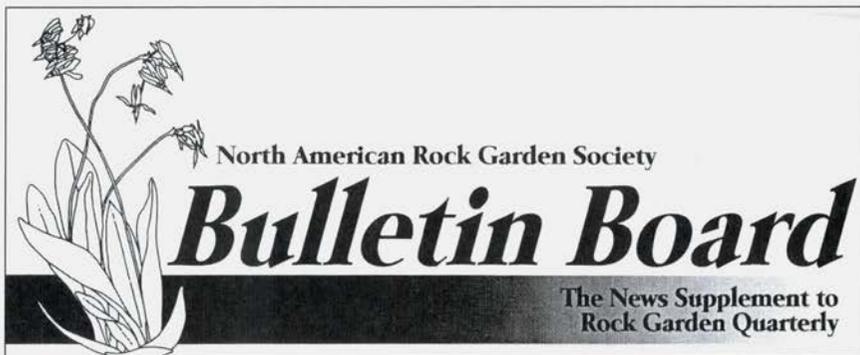
About the Artist: Sue Allen

Sue Allen has been designing and printmaking for many years, and the limited-edition screen prints she makes are distinctive and colorful, inspired by tradition, nature, and imagination. She grew up in Queens, New York, and spent happy childhood summers at camp in New Hampshire. After earning a Bachelor of Architecture degree from the Cooper Union, she made prints her main focus and livelihood. In 1981 she moved to Brightwood, a little town in the foothills of Mount Hood, Oregon, where she enjoys nature in all its seasons and can be creative and productive in her studio among the towering firs.

Sue's artistic directions range from nature and organic order to abstraction and geometry, and she veers repeatedly toward the Japanese aesthetic. A recent screen print project, "Around Mt. Hood: 12 months—12 directions," was awarded a grant from the Clackamas County Cultural Coalition and the Oregon Cultural Trust and has been on an almost continuous series of exhibits since completion. Miniature prints of the series illustrate a popular desk calendar. Another series, of 16 lanterns in the Portland Japanese Garden in four seasons, was juried into the Guild of Book Workers 100th Anniversary Exhibit 2007–08, traveling to six national venues for over a year.

Sue's work is shown in many galleries in the Pacific Northwest and beyond; she has won many awards. Examples of her refined, elegant, and unusual artworks can be seen and purchased at her website, www.suallenstudio.com.

This is her second series of covers for the *Rock Garden Quarterly*, the first having illustrated the 2001 volume.



From the President

Dear All,

It's winter. Chances are, you're not gardening unless you have a greenhouse or live in the Southern Hemisphere. Well then, give time to NARGS! There are lots of "job openings," and we'd love to have you! Choose any of these:

Membership Committee Chair and members: This is a job for a very dynamic group of people who will help us get new recruits. You won't be starting from zero: there is already a very good online document with ideas on where to begin. In addition to more traditional approaches, let's embrace new social networking methods. This group would include public relations and marketing elements in their activities. NARGS needs to publish a new membership brochure, and this would be one task of the committee.

Publications Committee Chair and members: Let's consider new technologies and start publishing in new media. Something that would appeal to beginning rock gardeners is a publication on alpine gardening in containers, an easy solution for people who don't have a rock garden but have a patio or balcony (*see article in this issue*). Another possibility is a CD on basic rock garden plants, with one-page write-ups and attractive color pictures. And can we do a very basic paper book on rock gardening for children? We need to start our members young!

Meetings Committee Chair and members: I'm convinced that chapters would be more willing to host meetings if they had good support from the national in planning them. We, the national administration, have done something about it, and now we have excellent, recently revised Meeting Planning Guidelines on the **NARGS Business** page in the Members Only area of our website; check Planning FAQ. The Meetings Committee would select chapters to host meetings and support them in the planning process. The Administrative Committee proposes that we hold only two national meetings a year: one Winter Study Weekend (Eastern or Western), and the Annual General Meeting, rotated, if possible, between the eastern and western parts of North America.

In addition to national meetings, chapters could organize regional events that might include garden visits, plant sales, workshops, and perhaps one common meal and one or two speakers. Hotel accommodations and meals would be the responsibility of participants.

Audit Committee Chair and members: The Audit Committee would be a group of people charged with making sure the NARGS audits are done properly. In the interest of transparency, we might turn to paid audits by an outside agency. Too expensive? Then these should be performed periodically, as is done, for example, for the Herb Society and the Gesneriad Society. This group will interact with the NARGS Board about how the audits should be done and will select either an outside auditor or qualified volunteers.

Fundraising Chair and Committee: There are many projects at NARGS that could benefit from an injection of money. It's time to put the NARGS fundraising program together: special campaigns, individual sponsorship of projects/events and planned giving. The first small step to that end has already been taken. The donation form is now part of the *Quarterly*. The form has also been placed on the website. Go to **About NARGS** and click on the last item on that page, **Donations**.

"Pollen to Compost" website project leader: The Pollen to Compost Project will collect and coordinate photos and written data on many categories about each plant and present this information in an easy searchable visual mode. This will include information on Seed capsules, Seeds, Seed collecting and cleaning, Germination, Seedlings, Pictures of plants in the wild and in the garden, a Text-to-speech generator that pronounces the names of the plants, Pests and Diseases, and Successful cultivation and propagation methods. This will be THE SOURCE of information for learning about the plants we want to grow. Please contact John Serowicz, Chair of the Great Lakes Chapter. Contact info is on NARGS website www.nargs.org, or through Bobby Ward, Recording Secretary <nargs@nc.rr.com>

Website News Items coordinator: I'm looking for a volunteer to head the "News" section of the NARGS website. What we need there is news from NARGS officers, chapters, individual members, and maybe other sources if it concerns NARGS or rock gardening in North America. This should be a lively and even entertaining section—the first place site visitors would go to.

Internet Committee Chair: A job for someone who likes digital technology. I've done the job for several years and now it's time to be replaced. The Internet Committee Chair will be responsible for ongoing changes on the website and employing computer-related technologies to enhance NARGS activities. Decisions about the website are currently done through the website volunteers, currently 14 of us, but the new Chair might opt for the smaller group of advisors. I'll be happy to work alongside the new Chair for a month or so, and then answer questions as needed. You'll find me on the website under President <grazynalg@sbcglobal.net>.

A new volunteer Webmaster: Last but *certainly* not least, Hugh, our terrific Webmaster (and creator of the NARGS website) is getting ready to retire, and so

we need one or more really good programmers to replace him. He, she, or they will need to know html, PHP scripting language, web design as well as web development, database backup and restores, the concept of user permissions, wysiwyg and text editors.

I hope to hear from many of you! Write: grazynalg@sbcglobal.net

*Best regards,
Grazyna*

Announcements!

Support NARGS financially! You'll find the **donation form** in this issue, or go to the website www.nargs.org, look at the news items at the top of the page—the link is right there.

The Administrative Committee, on behalf of all of NARGS members, expresses deep gratitude to **Frank Cabot** and his publishing company **Hortus Press** for the generous donation of 207 copies of *The Caucasus and Its Flowers* by Vojtech Holubec and Pavel Krivka. We sincerely appreciate Mr. Cabot's continued interest in and support of NARGS over many years. He has served as ARGs treasurer, organizer of the 50th anniversary of ARGs in Asheville in 1984, and as a historian of the organization. He received the Award of Merit in 1982 and has supported NARGS programs such as the Norman Singer Endowment Fund. In 1991, his New York state garden, Stonecrop, was open to participants at the NARGS Annual Meeting in White Plains. In national and international forums, Frank Cabot held the position of Chair of the New York Botanical Garden, founded the Garden Conservancy of North America, was made an honorary Member of the Order of Canada, received the American Horticultural Society's Liberty Hyde Bailey and Book awards, and is known for his world-famous, ever-improving garden "Les Quatre Vents" in Quebec. For his on-going support and service to NARGS, Frank Cabot has been given a Life membership to NARGS.

There is a limited number of **stipends** for NARGS members (you do need to be a member of the national) to attend NARGS Winter Study or Annual meetings. Information and a link to the application form are at www.nargs.org. You can find that info by either typing "Meeting Stipend" in the search field on the Home page, or clicking on "About NARGS" first, then "Membership", finally "Membership Policies". The stipends are described in the first column on the "Membership Policies" page. Alternatively, write to the Recording Secretary Bobby Ward, P.O. Box 18604, Raleigh, NC 27619-8604. IMPORTANT: the application needs to be signed by the Chair of the applicant's chapter.

The names of the three candidates for the Directors of the Board will be announced in the Spring 2010 *Quarterly* and voted on at the Annual Meeting in

Colorado, July 11–14, 2010. Prior to the mailing of the Quarterly on April 15, the candidates' names and short biographies will also be placed on the NARGS website in the Members Only area, and they will be e-mailed to the various NARGS constituencies. (Administrative Committee, Directors of the Board, Chapter Chairs, Editors, Webmasters) in early February by the Nominating Committee.

More Information on the Summer Meeting

The current issue includes registration information for Romancing the Rockies, next summer's NARGS annual general meeting. The forms are straightforward, but there are some things that could be underscored. This meeting is being organized somewhat differently as well, and this note might help clarify the changes. Panayoti's insider tips on the upcoming 2010 NARGS annual conference:

Romancing the Rockies will be the first NARGS foray into the very heart of the Colorado Rockies: the Mosquito and Collegiate ranges that flank Salida to the east and west respectively are both composed primarily of limestone, although the conference will traverse granite and sandstone areas as well, each harboring its own unique flora which should be in peak bloom during this conference. These are the highest peaks in the state, and the Arkansas River valley has the highest towns in the United States.

The conference fee covers a reception at Denver Botanic Gardens on Sunday, July 11, a reception at the SteamPlant in Salida on Monday, July 12, box lunches for the two days of hikes, and dinners on Tuesday and Wednesday. I recommend coming to Denver a day or two ahead of time so you can visit the open gardens on Sunday and take time to stroll around DBG. In addition to the reception at DBG on Sunday, there will be two speakers and an art show featuring alpine plants drawn by students from DBG's Botanic Illustration school.

If you want to share a rental car, check out the bulletin board on the RMC-NARGS website to see who else is interested and make arrangements with them, or you can sign up for a van ride from Denver (leaving from the Gardens) to Salida on Monday (a beautiful drive with some very interesting plant stops on the way).

Unlike other conferences, however, you must make reservations yourself at one of the full range of motels and bed-and-breakfasts in Salida. Breakfast will be on your own as well each day. I suggest you do this right away (recommended motels are on the conference website). If you don't have a vehicle and need transportation from your accommodations to the conference site, we will arrange a van to pick you up.

Those who drive to the conference can use their car to commute from motel to Conference center. The conference vans will be available to gather conferees in the morning for field trip departures. The proximity of high passes and having vans will ensure a great deal of flexibility, with lots of time to botanize and some time to unwind when we get back to town.

In summary, if you have any intention of coming, make a reservation in Salida TODAY (you can always cancel this eventually if you change your mind, or find alternatives). Plan on a few days beforehand or afterwards to enjoy some of

the great private gardens in the Front Range area, or to spend a few more days exploring in the fabulously rich Rocky Mountains. Do come join us for a romantic and thrilling time in the heart of the Rockies!

Applications accepted for grants from the Norman Singer Endowment Fund

Grants from the NARGS Norman Singer Endowment Fund are available to members of the Society to support projects that "advance the art and science of rock gardening." Both individuals and institutions may apply. For details, see the endowment guidelines on the NARGS website, www.nargs.org, under "Norman Singer Endowment Fund." Proposals for funding to be granted during the current year must be submitted before April 1, 2010, to the Endowment Committee chair, Beverly Shafer, by e-mail <lowlife@dubious.com> or post (P.O. Box 428, Etna, CA 96027). Awards will be announced at the Annual General Meeting in July.

Send in your nominations for the NARGS Awards!

This is a good time year to think about NARGS awards for 2010. Many hard-working and deserving volunteers should be recognized for their service to NARGS and to the rock garden and alpine plant community. The nomination process is straightforward and rewarding in itself. Look over the following criteria for awards, choose a worthy candidate, and compose a formal nominating letter describing how the person(s) meet the award criteria and why they deserve the award. Most awards also require additional support letters and supporting documentation. The Garden Award requires a pictorial presentation as well.

Forward the letters to the Awards Committee Chair, Lee Curtis, at buzz.curtis@netscape.com or at 1620 S. Parfet Ct., Lakewood, CO 80232. Deadline for submissions is May 8, 2010.

Award of Merit: Established in 1965, this award is given to persons who have made outstanding contributions to rock and alpine gardening and to the North American Rock Garden Society. *The recipient must be an active member of the society.* To nominate, please submit a letter stating why you feel your nominee deserves the award and what remarkable services to the Society he/she has performed. Provide at least two additional letters of support from NARGS members. It is suggested, but not required, that these supporting letters come from members in different geographic areas.

Marcel Le Piniec Award: Established in 1969, this award is given to a nursery-person, propagator, hybridizer or plant explorer who is currently actively engaged in extending and enriching the plant material available to rock gardeners. This may be a joint award if two people have worked closely together. *The recipient need not be a member of NARGS.* Nominations must be accompanied by a letter stating why this person deserves the award. Please provide a list of the specific activities, introductions, plant discoveries and/or propagations that qualify your nominee for the award. Provide at least two additional letters of support. It

is suggested, but not required, that these supporting letters be from members in different geographic areas.

Edgar T. Wherry Award: Established in 1973, this award is given from time to time to a person who has made an outstanding contribution in the dissemination of botanical and/or horticultural information about native North American plants. The works must be scientifically sound, but may be written for popular readership and do not have to be specifically about rock garden plants. Generally, the award recognizes a body of work or a lifetime of literary effort rather than a singular work. *The recipient does not have to be a member of the society.* Please include with your nomination a letter outlining the specific book(s) and/or articles written by the nominee that qualify them for the award. If possible, please give full citations: author, title, publisher, date and place. Supporting letters are helpful but are not required for the Wherry Award.

Carleton R. Worth Award: Established in 1985, this award is given to an author of distinguished writings about rock gardening and rock garden plants in a book or in magazine articles. Special preference is given to material published in the NARGS quarterly. *The recipient does not need to be a member of the society.* Please include with your nomination a letter outlining the specific books and/or articles written by the nominee that qualify him/her for the award. If possible, please give full citations: author, title, publisher, date and place. Supporting letters are helpful but not required for the Carleton R. Worth Award.

Marvin E. Black Award: Established in 1996, this award is given to a member of the Society who excels at promoting membership in NARGS, organizing study weekends, national and international meetings. This person should also be involved in such activities as planning trips to study plants and to meet other plant people. The emphasis shall be placed on a member who has helped other people to reach their potential in the plant world. Nominations must be accompanied by a letter stating why this person deserves the award and listing the specific activities that qualify them for the award. Please provide at least two additional letters of support from NARGS members. It is suggested but not required, that these supporting letters be from members in different geographic areas.

Linc and Timmy Foster Millstream Garden Award: Established in 2006, this award is given for an outstanding contribution to the North American Rock Garden Society in the form of creating a superior garden. This is not meant to be a competition, but to recognize members' great gardens across the various styles and regions of the United States and Canada. Since there is such a wide range of possibilities in style and climate regions, it has been decided there will be four categories: Container Garden, Alpine Rock Garden, Woodland Garden and Special Garden. Any must be a private garden, to eliminate institutional advantages. This award is meant to reward the creation of gardens that meet a wide standard set by the North American Rock Garden Society and reflect well on it. For more detailed information and requirements contact the current Awards Chairperson or use the NARGS website under "Awards".

NARGS Image Gallery is now open for uploading

TODD BOLAND, Image Gallery Administrator

This past summer several NARGS volunteers have been busy doing a major revamping of our website. If you have not already done so, take a look at the website at <http://www.nargs.org/>. Our website is multipurpose, providing visitors and members with what's happening with our organization, upcoming NARGS events and links to our many chapters across North America and perhaps most important to many members, our online Seedex!

Within the main NARGS homepage you will find a link to the NARGS Wiki homepage <http://www.nargs.org/nargswiki/tiki-index.php>. This is an interactive site where members can share their knowledge about alpiners via the rock garden encyclopedia and the image galleries. To gain interactive access to this site you will have to contact Bobby Ward <nargs@ne.rr.com>, who will forward your request for a username and password to our webmaster. You will see this link on the right hand side of the NARGS Wiki homepage. If you need more explicit information on this procedure, you can click the link '**Frequently Asked Questions**'. Information about how to upload information for the encyclopedia and image galleries are also located on the NARGS Wiki homepage under the link '**How To Do It**' and '**Frequently Asked Questions**'.

As the administrator of the NARGS Wiki image gallery, I am putting out a call for members to share their digital images of alpiners and other unusual garden plants. I have created galleries devoted to most of the common alpine genera and/or families. There are also galleries for more specialized gardens such as woodland and bog gardens. While most galleries are for plant portraits, there are also more general galleries for rock garden, crevice garden or trough overviews. New galleries will be created as the need arises so check it out regularly. It is the hope that these galleries will provide members with an on-line pictorial guide to most of the plants we enjoy growing. It can be a valuable tool for members when trying to decide which seeds they wish to obtain from our Seedex. However, this gallery will not work without the support of you, the members! NARGS would be delighted if you would share your digital images by uploading some to our galleries. Every image only furthers the impact and beauty of the image galleries. The only stipulation we request is that you resize your images to about 100 kb or 500 x 500 pixels. If you are not sure how to do this, click on our '**How to do it**' link on the NARGS Wiki homepage. Once you click that link, you can read the sections 'About Photos for the Wiki', 'How to Prepare Wiki Photos' and 'How to Upload Photos'. For consistency NARGS has decided that the image administrator (me) will be the only person able to edit within the galleries so if you make any errors, please feel free to bring it to my attention. My email link is located on the NARGS homepage. I, and the rest of NARGS, look forward to seeing YOUR pictures soon!

**Persons who joined NARGS
between August 1 and October 30, 2009**

Abe, Sumiko, 36 West 20th St., New York, NY 10011
Alderton, Timothy F., 4233 Laurel Ridge Dr., Raleigh, NC 27612
Bowie, Clarke & Phyllis, 114 Meadow Rd., Bel Air, MD 21014
Caldwell, Gloria, 51237 Caldwell Rd., Wirt, MN 56688
Carlson, Chuck, 1001 Hackman Circle, Fridley, MN 55432
Dambrosi, Paul, 189-15 50th Ave., Fresh Meadows, NY 11365
Heilig, Jim, 1807 Harding, Lansing, MI 48910
Janson, Maureen, 2114 East 5th St., Washington, MO 63090
Jones, Marion, 1805 Pawnee Dr., Fort Collins, CO 80525
Kurland, Lawrence, 196 East St., Sharon, CT 06069
Lagozzino, Wendy, 2811 Queen Anne Ave., North, Seattle, WA 98109
Mounce, Holly, 4717 Densmore Ave. N, #6, Seattle, WA 98103
Mulcahy, April, 24219 15th Pl, SE, Bothell, WA 98021
Newman, Jennifer, 176 Tsuganawwi Court, Brevard, NC 28712
Nicholls, Gerald, 22 Cherry Dr., Monroe, CT 06468
Noland, Karen, Little Cedars at Table Rock, PO Box 132, Eagle Rock, MO 65641
Osborn, Patrick, 2874 East Alsea Hwy, Waldport, OR 97394
Payne, Joanna, 46 Sussex Rd., Tenafly, NJ 07670
Pilon, Holly, 1920 Dexter Ave., Ann Arbor, MI 48103
Pinsky, Roberta, 3805 Evergreen Lane N, Plymouth, MN 55441
Richardson, Tanya, 36367 Panorama Dr., Yucaipa, CA 92399
Rifkin, Gerald, 310 Valley Rd., Merion, PA 19066
Siegel, Barbara, 4424 Norton Ave., Oakland, CA 94602
Swartz, Robert E., 3601 Devonshire, Sterling Heights, MI 48310
Tkach, Michelle, 14 Cleveland Ave., York, SC 29745
Vansteen, Ferdinand, 1164 Village Dr., Chino Hills, CA 91709
Vick, Andrew, 2701 Grand St., NE, Minneapolis, MN 55418
Feher, Cynthia, 960 Bank St., Victoria, BC V8S 4B2 CANADA
Gowribai, Krishnamoorthy, 1601 Early Dr., Saskatoon, SK S7G 3K5 CANADA
Hall, Earl, PO Box 1063, Owen Sound, ON N4K 6H6 CANADA
Pavlik, Mary-Jo, 386 Tareyton Rd., Richmond Hill, ON L4C 3X7 CANADA
Fryklund, Monika, Fagerstav 6, Sala 73336 SWEDEN

The following have recently become Patrons

Patricia Highberg (Vermont)
Bonnie and David Swinford (New York)

The following recently became a Life Member

Janet Novak (Pennsylvania)



NARGS COMING EVENTS

2010 Eastern Winter Study Weekend: March 19–21, 2010
Devens, Massachusetts, hosted by the New England Chapter
Contact: Rosemary Monahan, rosemonahan@comcast.net

2010 Western Winter Study Weekend: March 4–7, 2010
Medford, Oregon, hosted by the Siskiyou Chapter
Contact: Kathleen Pyle, kmpyle2@yahoo.com

2010 Annual General Meeting: July 11–15, 2010
Salida, Colorado, hosted by the Rocky Mountain Chapter
Contact: Randy Tatroe, rltaurora@aol.com

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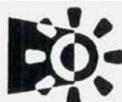


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NARGS 2010

Romancing the Rockies The Marriage of Plant and Stone

**July 11-14, 2010
Denver & Salida, Colorado**

Exploration and field study of the "edaphic factor": how does limestone or granite substrate influence the flora and biodiversity?

Join the Rocky Mountain Chapter of NARGS for a trip to the *undiscovered* Colorado that is every bit as beautiful—but somehow more pristine and authentic—as the famous resorts that grab headlines. The meeting is scheduled to coincide with the peak of the alpine season: come dance with *Eritrichium* and *Primula* on the very backbone of America! More information at www.rmcnargs.org, including about coming to high altitude (please read). Questions to Randy Tatroe, Conference Chair, at saximontana@gmail.com or 303-699-8958.

This unique conference will take place at a historic, renovated steam plant in the picturesque town of Salida (elevation: 7,083 ft [2,159 m]), near the headwaters of the Arkansas River in a broad, U-shaped, glaciated valley. Salida is poised with the Collegiate Peaks soaring to the West and to the East, the Mosquito Range, with its own cluster of 14'ers. These two ranges are comprised of Leadville Limestone, which boasts the lion's share of the Southern Rocky Mountain alpine plant endemic taxa.

Register with the Rocky Mountain Chapter for the meeting and make your own housing reservations in Salida; nowthisiscolorado.com/ has good information. (Reserve quickly, as this popular town can fill up.) There are many other local activities in the Salida region, including rafting, historic train rides, hot springs and national parks.

Day 1 (Sunday, 7/11): Outstanding rock garden visits (on own) around Denver and reception, speakers, alpine botanic art show and Henry Moore outdoor sculpture exhibit at Denver Botanic Gardens.

Day 2 (Monday, 7/12): Optional bus from Denver to Salida, with stops for guided botanizing. Evening reception, dinner on own and speakers Kirk Johnson: "The Rockies through Time: a Geological and Paleobotanical Whirlwind Tour" and Zedenek Zvolanek: "Tao of Limestone: Great Limestone Mountains and their Plants."

Day 3 (Tuesday, 7/13): Hikes, plant sale, exhibits, book sale and dinner, with speakers Wiert Nieuman: "The Recycled Rock Garden from the Lowlands to Rocky Heights" and Marcia Tatroe: "Rock Gardens of the Rockies."

Day 4 (Wednesday, 7/14): Hikes, plant sale, exhibits, book sale, closing banquet with business meeting, and speaker Vladimir Kolbintsev: "Central Asia: Lovely Steppe-Sister of the Rockies."

7/15 (Thursday): Optional buses back to Denver.

Plant Sale:

Exceptional plants from regional specialty rock garden nurseries.

Speakers:

Zedenek Zvolanek. No rock gardener has created more stunning gardens in more places: across the United States, Canada and much of Europe. He is every bit a notable plant collector who has introduced hundreds of spectacular alpine to rock gardens from Europe and Asia Minor, including *Campanula choruhensis*, *Matthiola montana* and *Centaurea achtarovii*.

Kirk Johnson. This dynamic speaker joined the Denver Museum of Nature and Science after earning his doctorate in geology and paleobotany from Yale University. He studies fossil plants, terrestrial stratigraphy, geochronology, and dinosaur extinction; and has published many popular and scientific articles on topics ranging from fossil plants and modern rainforests to the ecology of whales and walrus.

Wiert Nieuman has overseen the magnificent rock garden at Utrecht Botanic Gardens in Netherlands for nearly 30 years; this is not only one of the finest collections of rare alpine plants, but a garden of great artistic creativity filled with novel and sustainable design. Long before sustainability became a catchword, Wiert and his staff have used nothing but recycled materials for their construction.

Marcia Tatroe. As a monthly contributor to Sunset Magazine and garden columnist for the Denver Post, no gardener in the Rocky Mountain region has made a greater effort to gauge the pulse of our horticultural scene. Author of *Cutting Edge Gardening in the Intermountain West*, she has also created one of our region's more distinctive rock gardens. She and husband Randy travel widely photographing gardens.

Vladimir Kolbintsev. For over 20 years, Vladimir was research scientist at the Aksu-Dzhabagly nature reserve in Kazakhstan. As a naturalist, he has an amazing grasp of the flora, fauna, geology and ecology of Central Asia; he has led dozens of tour groups through the Tian Shan and Altai Mountains, Colorado's closest climatic correlative.

Hikes:

Monarch Pass. Take in the spectacular scenery on a ten minute gondola ride to a knob above Monarch Pass. Disembark and immediately you are strolling on a Persian carpet of alpine cushion and mat plants. *Silene acaulis*, *Eritrichum aretoides*, and *Minuartia obtusiloba* abound. *Easy half mile.*

Independence pass. From the parking lot, a nearby level trail takes you along an endless field of alpine plants. More than 60 species are to be found on this easy stroll. *Tetranuris grandiflora*, *Rhodiola integrifolia*, and many *Erigeron* are just a few of the flowers you are sure to see; colors abound! The trail on this land above the trees goes on and on. *Easy.*

Cottonwood Pass. Discover at least 40 species of alpine plants within several hundred yards of the parking lot. After lunch overlooking a small alpine pond, more energetic participants may want to hike to a knob a couple of hundred feet above, where *Aquilegia coerulea*, *Saxifraga bronchialis* and *Phacelia sericea* grow tucked into crevasses high above the Continental Divide. *Easy quarter mile or moderate three quarter mile hike.*

Weston Pass. At Weston Pass a brief, nearly level walk above treeline passes near an old mine and tailing rich in alpine flora. Among the many flowers are some Mosquito Range endemics like *Physaria alpina*, and *Astragalus molybdenus*, while *Ipomopsis spicata* ssp. *capitata* fills the air with its fragrance. The trail can be followed to a small knob which makes for a three mile round trip. *Easy to moderate.*

Mt. Sherman and the Dauntless Mine. This hike features a fine variety of alpine goodies: mesic (waterloving) plants along the creek and dry-meadow alpine. Some Mosquito Range endemics to be seen are *Astragalus kentrophyta* var. *implexus* and *Physaria alpina*. To see all the special flowers, a hike of three miles with an elevation gain of one thousand feet is necessary. *Moderate to difficult.*

NARGS 2010 Annual Meeting
July 11-14, 2010
Denver & Salida, Colorado

REGISTRATION: Print Name as desired on name tag:

Name#1 _____

Name #2 _____

Address _____

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Tele No. _____ E-mail _____

Registration includes receptions on July 11 (at Denver Botanic Gardens) and July 12 (at The SteamPlant in Salida); lectures on July 12, 13 and 14; bus trips and box lunches on July 13 and 14, and dinners on July 13 and 14. **Registration deadline: June 15.** Cancellations prior to June 15 will be subject to a \$50 fee.

Rec'd by May 1, 2010 \$350 each \$ _____

After May 1, 2010 \$375 each \$ _____

Optional Bus Trip* \$ 50 each \$ _____

Non-registrant banquet guest \$35 per meal \$ _____

If not a member of NARGS, VIRAGS or AGC-BC,
add \$30 for 1-year NARGS membership. \$ _____

Total enclosed \$ _____

of vegetarian dinners _____

*Transportation from Denver to Salida on July 11 and Salida to Denver on July 15 (includes stops along the way on July 11 for plant hunting)

(continued on reverse)

To register by mail: fill out the information above and include it with your check or money order in **US Dollars** payable to RMC-NARGS to:

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To pay online go to: <http://nargs.org/2010annual>. Instructions for payment are on this webpage. This is a secure PayPal site. We accept Visa and Mastercard. Since this method is for payment only, the 2010 Conference Registrar will contact you directly to get additional information. More detailed information about the conference will be sent to each registrant.

Salida is at the very heart of the Colorado Rockies: the Mosquito range juts up at the east end of town and the Collegiate range is a short drive westward; these two ranges, where a half dozen passes rise above tree line, harbor the lion's share of beautiful, rare and little known alpines endemic to the Southern Rockies.

Each attendee will see the keynote plants of the conference such as alpine bladderpod (*Physaria alpina*), a bevy of cushion locoweeds (*Oxytropis* spp.) and veritable carpets of alpine forget-me-not (*Eritrichium aretioides*)—just a few of the hundreds of alpine treasures that abound here. Vans will be loaded by hiking level (sprinters, trail plodders and those who prefer to stroll); no one will be left behind, and everyone will access choice tundra sites!

Every trail we have chosen promises to be a winner, so attendees will be assigned by hike level rather than by trail preference. We are primarily using 15-passenger vans so that we can take people to locations not accessible by larger buses and so we can make the lightest possible impact on the fragile tundra ecosystem.

Choose one hike level preference per registrant.

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Hike Level: Easy _____ Moderate _____ Difficult _____

Registrant #2

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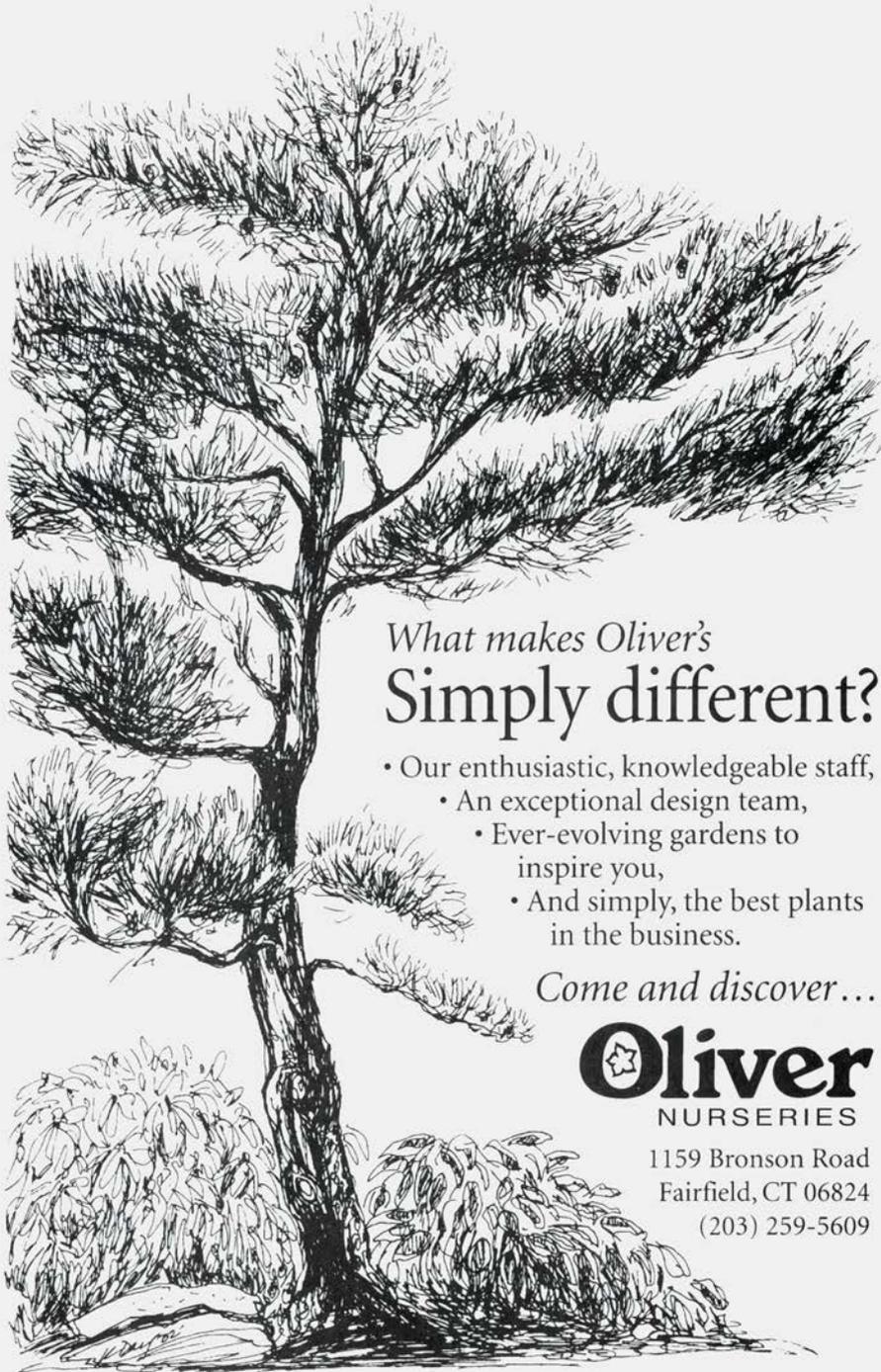
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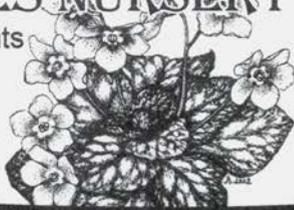
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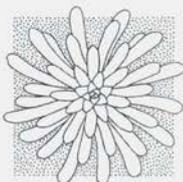


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