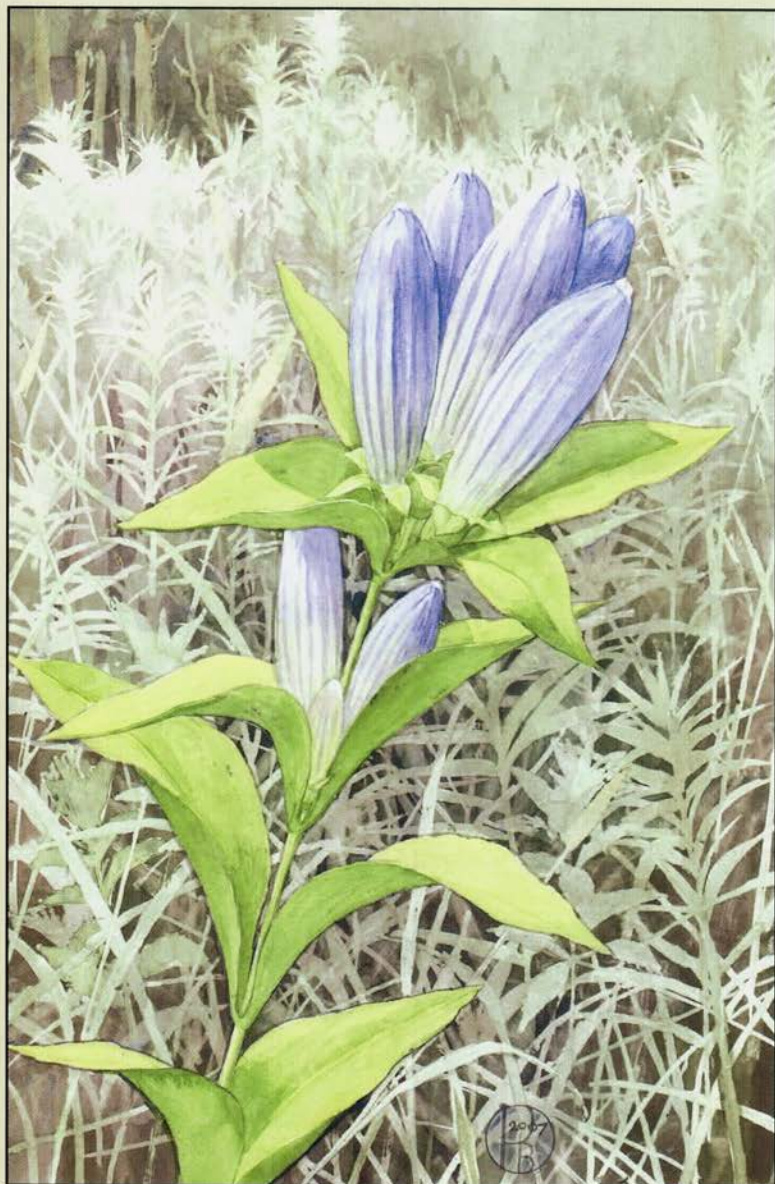


ROCK GARDEN *Quarterly*



Volume 65 Number 4

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Front cover: *Gentiana andrewsii*. Painting by Paul Bowden.

Back cover: Cliff above a valley in the Slovak Karst. Photograph by Todd Boland.

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ROCK GARDEN

Quarterly

BULLETIN OF THE NORTH AMERICAN ROCK GARDEN SOCIETY

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This Issue's Cover:
Gentiana andrewsii Griseb.,
Bottle Gentian or Blind Gentian

C. COLSTON BURRELL

Watching a worker bumblebee maneuver into the tight opening of bottle gentian to pollinate the flower is one of the spectacles of the natural world. A study in persistence, the bee manipulates the funnel-form corolla until she gets her front legs into the opening. When at last she parts the 5 ragged lobes, she slips into the flower, then backs out with her nectar and pollen reward. Some bees chew free through the side of the flower, but more often, crafty bees bite into the sides for expedient entry.

Shaped like Coke bottles with truncated necks, the rich purple-blue flowers cluster at the tips of the stems, set off by irregular collars of glossy leaves. When squeezed, the ragged lobes are visible above the membrane that binds them together. After pollination, the flowers fade to pink, a signal to bees not to waste their energy entering – the larder has been plundered. White-flowered variants are occasional throughout the plant's native range; pure white forms are coveted additions to the garden, often listed as 'Alba'.

Mature plants stand erect, the 1.5- to 2-foot stems graced with paired glossy, oval to broadly lance-shaped leaves. Flowers cluster at the stem tips, but a few also are often borne in the upper leaf axils. The plethora of buds ensures bloom from late summer through fall. Look for bottle gentians in low, moist open woods, around the edges of wet meadows, prairies, and freshwater marshes or along roadside ditches in full sun to partial shade, from Quebec and Manitoba south to Virginia, Missouri and Colorado.

Bottle gentians are easily cultivated in evenly moist, humus-rich soil in full sun or partial shade. Protect them from hot afternoon sun, especially in warmer zones, to avoid scorching the foliage. Gentians are long-lived and thrive with little care. Plants seldom need division, and the fleshy white roots dislike disturbance. Mature plants have up to a dozen stems densely crowned with flowers. Sow fresh seeds in late winter with 4 to 6 weeks of cold, moist stratification. Plants take up to 3 years to bloom from seed. This species is hardy in Zones 3-8.

Bottle gentian defies frost and cold to lift your spirits with bright color in the midst of autumn's decline. Late flowers are scarce, and with so much yellow in autumn, blue is prized. Combine bottle gentians with other late bloomers like toad lily (*Tricyrtis*), turtlehead (*Chelone*), autumn crocus, and *Patrinia*, as well as the colorful fruits of baneberry (*Actaea*) and beautyberry (*Callicarpa*) to maximize the colorful display. Set off the blue flowers against a backdrop white wood aster (*Aster divaricatus*), sedges, and ferns.

A Seed-hunting Expedition to Morocco

Tom Bland and Mike Kintgen

At the 2005 annual meeting of NARGS in St. John's, Newfoundland, Randy Tatroe gave a presentation on a planned expedition to Morocco. NARGS was generously providing a stipend to offset part of the cost. There were two parts to the project: first, a scouting phase during the main flowering season, and second, a seed-gathering phase. Each phase was carried out by a different party. Randy Tatroe and a fellow Coloradan, Rod Haenni, traveled to Morocco in May and early June to find plants of interest, using a GPS device to mark promising locations. After they returned, they gave the data to Mike Kintgen, a horticulturalist at the Denver Botanic Garden. Mike was joined by Tom Bland of Portland, Oregon, and Rodger Inglis of Port Perry, Ontario.

Tom combined a short visit to Spain with the expedition, reaching Morocco by night express train to Algeciras, ferry across the Strait of Gibraltar, and day train from Tangier to Marrakech. The last was not fun: eleven hours in temperatures above 100° F, with no air conditioning. (The night train is entirely different, with air-conditioned European-style sleeping compartments.)

Marrakech was a sweltering 120° F the next morning, but Tom enjoyed touring the souks (traditional markets), getting lost in the Medina, and drinking the best orange juice he'd ever had, absorbing the wonders of an ancient and fascinating city. The next day, July 23, Mike, Rodger and Tom rendezvoused. Rodger and Mike had flown in and were waiting in a rather swank Marrakech hotel, which Tom gave them no end of grief about. After getting acquainted, we rented a four-wheel-drive Toyota Prada and headed north toward Ifrane, in the Middle Atlas mountains about 250 miles northeast of Marrakech and at the pleasant altitude of over 5,000 feet. We drove across the vast desertlike plain that lies between the Atlas Mountains and the Atlantic Ocean. Gradually the orange groves and date palms gave way to dryland farming and grazing. Near the town of Khenifra the road began to ascend steeply into the Atlas foothills. Scrub gave way to a holm oak (*Quercus ilex*) and Aleppo pine (*Pinus halepensis*) woodland, and then a mixed forest of cedar and oaks. We were eager to see *Cedrus libani* var. *atlantica* in its natural surroundings; the trees look similar to the ubiquitous *Cedrus deodara* but are much more graceful. Arriving in the town of Azrou near

dusk we could see the silhouettes of cedars on a ridge above the village. At this higher elevation the air was cooler and refreshing. Azrou was filled with people leaving the mosque, and the great social gatherings that we would often witness in the villages each night had begun. Pressed for time, we pushed on to Ifrane at an even higher elevation. Through the dark cedar forest we glimpsed the night sky.

Ifrane is an interesting town, a product from the French protectorate of Morocco that lasted for more than 40 years, from 1912 to 1956. Here the typical stucco and earthen architecture of Morocco is replaced by buildings that would fit in Vail or Saint-Moritz: pleasant little sidewalk cafes, a somewhat rundown park, many steep-roofed buildings, and a former Catholic church now converted into a combination police station and post office. There is even a small ski area a few miles away at Mischliffen. Despite Ifrane's French looks, its name is a Berber word meaning "caves," a frequent feature in this limestone region. Ifrane sits at almost 6,000 feet and receives a fair amount of snow each winter—with cover from December to March in heavy snow years. The area can be quite cold, too; an Englishman teaching in a local school mentioned that the winter of 2004–2005 had seen temperatures approaching 0° F (–18° C). A great little family-run hotel became our base for the next few days.

For the next several days we traveled up into the Middle Atlas and went to the GPS locations that Rod and Randy had identified. Each day as we drove up, we were shocked at the effects of overgrazing. Where once there had been meadows and grassy hillsides, it was rocky and barren. In most places all of the forest undergrowth was gone. All that remained in the forest were the huge cedars, holm oaks, and many small plants that were either spiny, poisonous, or tiny. To our disappointment, nearly all of the woodland plants, meadow grasses and sedges, and other plant communities we were used to seeing in alpine ecosystems were gone. Everywhere we saw goats and sheep. The mountains of Morocco are inhabited by nomadic Berbers who follow their flocks, living in tents, much as they must have done in antiquity. It is estimated that overgrazing has occurred in the Atlas for over two millennia, and the plant communities have adapted to this in fantastic ways.

After breakfast the first day and a quick look around the town, we drove southwest toward the ski area at Mischliffen. The contrast of the bluish cedars and greenish live oaks against the brown grasses reminded us of California or southern Oregon, with conifers on the moister sites and dry chaparral vegetation on hot, dry sites. Along the road *Eryngium triquetrum* added a blue haze to some open, overgrazed fields. This plant looks potentially invasive, but its structure and color were interesting.

Our first GPS waypoint was a site for *Paeonia coriacea*. This peony is native to both Spain and Morocco. With lovely pinkish flowers in May and rather short stature (to 18 inches/45 cm or so), it was one of the gems of the trip. Nowhere common, it sought out cool ravines in the cedar forest, often forming small clumps of 2 to 6 individuals. While wandering the forest in search of peonies, we also found a host of other interesting plants. This was one of the best waypoints

we would visit on the trip because grazing was not allowed there. *Cistus* aff. *laurifolius* grew on top of small ridges facing south, while several species of *Salvia*, including *S. argentea* var. *patula*, grew along the forest edges. The meadow area along the road was full of *Dianthus*, *Helianthemum*, *Teucrium*, *Thymus*, and *Armeria choulettiana*. Most of these species had long since bloomed, but here and there was a pink *Dianthus* or yellow *Helianthemum*. The first stop would provide to be just an appetizer.

Moving on, we left the ungrazed area and moved into an area used by semi-nomadic herders. Goats are by far the most common domestic animal in Morocco, and we quickly learned a certain amount of respect as well as disdain for them. Able to eat many plants that other animals find inedible, they can quickly strip an area of vegetation. This activity, repeated over centuries, has left parts of Morocco resembling pictures of Mars. Despite the heavy grazing, though, there were still many spiny gems to be found. "Spiny" would be the theme for most of the trip. In one area the metallic blue-and-purple-spined flowers of a plant closely resembling *Cynara hystrix* graced the roadside. Several miles of highway were festive with this goat-proof plant. In another area resembling the high, windswept plains of Wyoming, we were treated to acres of the spiny cushions of *Erinacea anthyllis*. Though long out of flower, its evergreen, spine-tipped twigs make it attractive in the garden or the wild all year. Tom found one cushion that measured 3 feet/1 m across. Sprinkled among the hedgehogs of *Erinacea* were the equally spiny cushions of *Bupleurum spinosum*. Unlike *Erinacea*, which blooms in late spring or early summer, this *Bupleurum* adds its yellowish green to the parched landscape of mid to late summer. The sun was starting to lower in the azure sky, signaling that it was time to move on if we were to do more collecting. Returning toward Ifrane, we stopped briefly at Mischliffen and collected seed of a particularly blue cedar.

Near Ifrane one passes through a low set of hills rising above the plateau where Ifrane lies. On these hills another waypoint had been marked by Rod and Randy. Interesting plants here included *Anagallis monellii*, a long-blooming annual with orange-red flowers on short creeping stems, which made its home in roadside gravel along with a lavender form of *Delphinium obcordatum*. (Later we would see the bright blue form of this plant in the High Atlas near Jebel Toubkal.) There were beautiful cushions of *Catananche caespitosa* and a daphne-like shrub with silvery green leaves, most likely a species of *Thymelaea*. It would make an interesting dwarf shrub in the rock garden. Farther up the slope, chaparral vegetation of dwarf *Quercus* and *Rhamnus* closed in, and the herbaceous material varied between open meadow and shady areas under the dwarf oaks. In open areas we found a dwarf *Helianthemum* with silver-edged leaves, which proved to be *H. cinereum* subsp. *rotundifolium*. In the shelter of the oaks grew *Ruscus aculeatus*, the evergreen butcher's broom, unfortunately without any of its red berries that sit, oddly enough, in the middle of the leaves.

Farther up the hill, a delicate asparagus (probably *Asparagus albus*) was creeping over and around the bases of the oaks. The cute prize of the day, however, went to a sedum that made its home in the highly pitted limestone. It seems

closest to descriptions of *Sedum dasyphyllum* and is a lovely bluish green when growing in shade, but a warm pinkish color in more exposed sites. As the sun dropped below the western horizon, the cedar-covered hills glowed in the warm light. It was a fitting end to a very productive first day.

After several days in Ifrane, we decided to journey to the High Atlas Mountains, to the area around Imilchil. We had been advised by Rod and Randy that one certain road was terrible and that we should go a different way. Our experience on the "better" road was probably equally as bad as the route Rod and Randy took. The road had washed out in numerous places, and it was blocked with road construction and gates that required a fee to pass through, as well as an irrigation ditch under construction and crossed by a makeshift ramp. But despite the condition of the road, the route was beautiful, with tiny, remote villages perched on the mountainsides, villagers who relied on animals for all transport, and landscapes that looked Himalayan, with sheep and goats everywhere. The High Atlas is very dry, lying in the rain shadow of the Middle Atlas. The villages were situated along streams. The villagers farm every square inch of arable land on the valley floor, with apple orchards and plots of wheat, potatoes, tomatoes, and squash. Flocks graze on the barren hillsides above.

Quickly passing through the same area we had already explored, we drove down onto the plateau that separates the Middle Atlas from the High Atlas. Some areas were heavily grazed or cultivated, while others were rather pristine. This is probably one of the coldest areas in Morocco, experiencing a truly continental climate with frigid winters and frying summers. Gone were the olives, pomegranates, and figs that thrived in milder areas. The plateau lies at an elevation between 4,500 and 5,500 feet and is rather arid. The village of Boumia was the last sizeable town we would see for a while. Beyond Boumia the terrain began to rise, and the peak of Jebel Ayachi could be glimpsed though the heat haze. Here, in the colorfully rocky, eroded hills south of Boumia, we would find some of the most interesting plants of the trip. On scorched slopes dotted with goat-pruned oak and juniper, we spied interesting silver cushions that turned out to be *Scabiosa graminifolia* var. *compacta*. If this plant holds true to its wild form, it will be a great addition to rock gardens. Quicksilver leaves form a dense cushion over which flowers of pale lavender mature to interesting seedheads resembling miniature geodesic domes. Keeping company with the *Scabiosa* was a pale yellow *Santolina*, and a white-flowered and silver-leaved *Teucrium* similar to *T. polium*. An unidentified purple-flowered subshrub in the mint family also grew in the area. We found a very tempting *Astragalus* just downslope from the *Scabiosa*, growing as flat masses of hairy leaves and very woolly seedpods; it could compete with some of the western North American species of *Astragalus* in visual appeal.

Past the village of Tounfite we entered a canyon and finally were in the true High Atlas. Above us on all sides rose jagged peaks of limestone and other sedimentary rocks. A thin forest of *Cedrus libani* subsp. *atlantica*, *Juniperus thurifera*, and *Pinus halepensis* attempted to soften the harshness of the peaks. From here the road went from bad to worse. The heavy rains of the past May had taken

their toll on it. Rumbling up the rough dirt trail took time, but the views were worth it. Hour by hour, the amazing scenery unfolded. At one stop where we pulled over to allow a large truck to pass, we collected a *Buxus* species, probably *B. balearica*. In the heat of July its color had faded to "army green." Like many other plants we saw, we found this boxwood in just a few spots, and then never again.

Climbing ever higher, we passed Berber villages tucked into the mountain valleys. Late July was the time for harvesting wheat, and the golden fields were a stark contrast to the bright green orchards and potato fields. The Berber women in their colorful traditional clothing added to the beauty of the rural scenes.

After several hours, we crossed a pass into a different drainage where the soil was a rich chocolate, brown with a hint of red. The surrounding hillsides were like layered desserts of milk chocolate, dark chocolate, cream, caramel, and raspberry. A brief stop to stretch our legs and see what was growing revealed tenacious *Echinops spinosa*, with the reddish-brown soil a perfect background for its off-white flowers and beautiful golden spines. Heavily grazed shrubs of *Artemisia* added greenery where they could catch a foothold. Lacy leaves of a *Fumana* species graced a steep rocky slope, while crisp white *Arenaria pungens* added the only flower color.

Back in the car, we crept down into the cedar forests of the far eastern High Atlas. Here in the high mountains there is tremendous pressure on the woody plants used as fuel by the local people. Many of the cedars had their normally long branches removed, to be replaced by a mass of short branches regrowing from the trunk. In this drainage much of the route ran down a streambed where the spring rains had washed out any semblance of a road in places. The challenge was to pick out the tracks of other vehicles so as not to fall into a soft spot or get high-centered. Hour after hour we climbed and descended through several different valleys, with each Berber village more picturesque than the last. When the road forked, we kept to the path more traveled or asked the local children to point the way to Imilchil, our destination for the night.

After many anxious hours, we began to near the waypoints set by Rod and Randy on the highest pass we would cross. Above a picturesque valley we climbed out of the sparse forest into an area of wheat fields and high pastures. Our goal was *Vella mairei*, a spiny, shrubby mustard with pale yellow flowers. At around 8,000 feet *Vella* made its appearance. Not much farther up, on a bend with a great view, we saw what was likely *Eryngium bourgatii* in full bloom and ripening seed. Less robust than plants in cultivation, most had only one stem. It chose to grow on north-facing, rocky road cuts with little competition.

Once again the sun was nearing the western horizon, and we still had the top of the pass to explore and collect seed on. About half a mile beyond the *Eryngium* we crested the pass and beheld a community of giant buns: spiny cushions of *Ptilotrichum spinosum*, *Genista balansae*, and *Erinacea anthyllis* all woven together. All three species had ripe seed, which we quickly gathered. Still unsure of how far Imilchil was, we were ready for a quick descent into a valley of sunset-glowing wheat fields guarded by a textbook example of fold mountains. Luckily, the road

was much smoother than before, and within an hour or so we reached the Berber village of Imilchil. Quickly the warmth of day faded as darkness overtook the highest peaks.

Having found a good little family-run hotel, we stayed there for several days and explored the surrounding area. We were met by eager villagers who were anxious to sell things to tourists. None of us spoke Berber or Arabic, but Rodger speaks some French, and Mike and Tom speak fairly fluent Spanish. To our delight, the villagers spoke Spanish, and so we communicated mostly in that language. One villager, Abdoul, offered to take us to his home to "see" his rugs for sale. We went along and after a little haggling bought rugs made from wool from the family's own sheep. The matriarch of the house carded the wool, dyed it with natural dyes from the mountains, spun it using a spindle, and then wove it on a loom. The village has electricity from a generator that is turned on from 8 PM to midnight. The result is a community that spends many hours in the evening visiting with friends and family and taking walks through the town. Full-time electricity is coming, and we warned them that they might regret it in some ways. They knew that but said eagerly that progress was inevitable.

Imilchil lies near two rather high lakes, Lake Tislit and Lake Iseil, believed by the Berbers to be the tears of two separated lovers. Both are an amazing blue in color, cradled in a stark landscape of treeless gray and brown peaks. Lake Tislit proved to be the best seed collection area because grazing is not allowed near the lake, so many plants that the goats had devoured elsewhere had ripe seed. Here we found seed and flowers on *Campanula filicaulis*, the ubiquitous small purple bellflower of Morocco. This little plant would be our friend throughout most of the trip, from low elevations to above 10,000 feet. Plants in the Fabaceae (pea) and Asteraceae (composite) families were very prevalent here, as throughout Morocco. One highlight was finding *Catananche caespitosa* in seed. It superficially resembles *Scorzonera humilis* but the difference is in the seedheads. A few interesting salvias were present as well; one had very silvery leaves, and if it is the same species Rod saw in May, it should have rich purplish flowers.

Lake Iseil was a sharp contrast. Grazing is allowed right to its edge, and almost no vegetation remains. Instead, a Martian landscape of eroded gullies ends in a scalloped shore of miniature deltas. Despite the rather barren setting, there were a few interesting plants there. A charming little *Ononis* grew along a gully, beckoning with pink and white flowers; it was very similar to, if not actually, *Ononis cenisia* (photo, p. 330). Closer to the lakeshore, *Anacyclus depressus*, the Mount Atlas daisy, made an appearance. Lake Iseil was the only place we saw it, and while the one plant we saw was a rather sad specimen, it reminded us of the reason for the trip. *Anacyclus depressus* does very well along the Front Range of Colorado, and people thought that this implied that other plants from same area might too. Oblivious to the wind picking up and the dark clouds rolling in, Mike wandered off in search of other plants. He had spotted dark green shrubs on a distant slope, which proved to be *Berberis hispanica*, a very spiny, tough suckering shrub. Suddenly a wind-driven dust cloud accompanied by large rain drops enveloped the lake and us. Whipped mercilessly by the wind, we ran for the car,

but just as quickly as the storm had appeared it blew onward, leaving everything much dustier.

Heading back toward Lake Tislit, we stopped to photograph the houses with dry stone walls in the area. The area between the two lakes is heavily used either as grazing or for a rather sparse wheat crop, so we saw no native plants except a rather tall sedum resembling *Sedum reflexum*. The dirt road crossed a very dry, desolate plateau with many ruined houses, but here and there we saw tethered donkeys and once in a while a Berber shepherd. The shepherds throughout the Atlas collect crystals and other interesting rocks while wandering through the mountains, then offer to sell them to passing travelers. As our truck bounced along the road, out of nowhere a man came running as fast as he could go, carrying rocks for us to buy. We felt a bit guilty not buying any, but we couldn't imagine hauling these crystals through the rest of the trip.

We stopped later to explore a spine of uplifted rock that we had neglected on the way in. On the warm south-facing side grew a small, ornamental *Rhamnus* that had been artfully pruned by the goats. In similar crevices was *Bupleurum spinosum* just coming into flower. The north-facing crevices offered up a handful of little treasures. Tucked away from the goats were sedums similar to the one seen near Ifrane, a tiny *Saxifraga*, *Draba hispanica*, and a *Paronychia* in seed. After we had exhausted what the spine of rock held, hunger took over and we headed back to Imilchil to eat and start cleaning and organizing the seed from the past few days and to prepare for our journey across the mountains to Ouarzazate.

Our acquaintance Abdoul found us when we returned and asked us if we wanted to come to his home for mint tea (and, he assured us, no hard sell on carpets). We had an enjoyable visit with him and one of his friends. He took us on a tour of his vegetable garden, told us about the village political and familial structure and how irrigation water was allotted, and about his family history of transition from nomads to village dwellers. He took us on a walk past the mosque and then to the granary. At the end of this very interesting evening, he asked us if we would take him along as a guide to Cascades d'Ouzoud and eventually to Ouarzazate, for no charge. At the time it seemed like an okay idea, so we agreed that the next day he would meet us right before we were to leave and would ride with us. The next morning, we had a good breakfast, spent a few quick expensive minutes at a souvenir shop, picked up Abdoul, and headed off to Ouarzazate.

The road to Cascades d'Ouzoud got progressively better as we drove down from Imilchil, and the air temperature went up. Driving parallel to the High Atlas, we crossed short passes and descended into narrow river valleys. On the higher passes, above 4,000 feet, grew magnificent colonies of shrubby *Chamaerops humilis*. The only palm native to the western Mediterranean, it graced the hills and pastures with its blue-green or green fronds. Morocco is known for a silver-blue form sometimes called var. *cerifera*. A quick stop for seed proved fruitless, and the heat and the drone of cicadas finally drove us back to the car. When we were almost out of the mountains, we met an unfamiliar sight: camels grazing next to the road. Not long after that we noticed large clumps of a new plant on

hillsides across the canyon. We found that these were *Euphorbia resinifera* with beautiful, mint-green succulent stems cascading down the slopes; poisonous, they had been left alone by the goats. Soon whole hillsides were covered with it. Though doubtfully hardy in Denver, *E. resinifera* was one of the vegetable highlights of the trip. Found mainly between the towns of Demnate and Beni-Mellal, it is endemic to central Morocco, and we would cover most of its territory in the next two days. Pink *Nerium oleander* graced the arroyos and riverbanks, as it had for most of the day.

We were traveling southwest along the edge of the mountains and meant to drive relatively close to Marrakech, then turn and head back up into the mountains. Our plan was then to stay overnight at the Cascades d'Ouzoud before heading over the mountains. The Cascades are a series of waterfalls flowing over steep cliffs. The elevation is relatively low, so it's quite warm in summer and thus a destination for Moroccans and a few adventurous tourists looking for some relief from the heat. The water forms pools at the base of the falls, where many people were swimming. We passed on this opportunity because the water was muddy and probably polluted. We did walk along the cliffs overlooking the falls and got some great photos. It came time to find a place to stay for the night, and Abdoul volunteered to assist us. He suggested a place that was not to our liking, and when we said that we wanted to keep looking, he resisted. It became clear to us that he was expecting to get a "finder's fee." We selected a different hotel and then evaluated what to do about Abdoul. We decided to release our "tour guide" with a couple of packs of cigarettes and some money and go the rest of the way on our own. That night we stayed in a very nice hotel called the Riad Cascades d'Ouzoud.

The next morning, as we were leaving the hotel, we noticed that one of our tires was losing air. The only service station of any consequence was at Azilal, a number of miles back toward Marrakech, so we returned to it and had the tire refilled. Luckily it held air for the rest of the trip. West of Azilal we found a whole hillside of *Euphorbia resinifera*. A stop proved that it had ripe seed, quickly collected. We were now ready to move west toward Demnate and eventually on to Tizi n'Tichka Pass.

Demnate is known for its natural bridge, left by the collapse of a naturally carved tunnel in the porous limestone. The display of *Euphorbia resinifera* had been spectacular near Azilal and Cascades d'Ouzoud, but nowhere were there more plants than at Demnate. Whole hillsides were a strange lime green, so dense that very little brown soil showed through.

Moving westward from Demnate, we passed onto the plains near Marrakech. Heat haze obscured the peaks only 12 to 15 miles away. Groves of date palms faded into the haze, creating a mirage effect. Turning south toward Tizi n'Tichka Pass, we began gaining elevation again. The plains disappeared behind the first row of foothills and in the hazy distance loomed large mountains. Climbing quickly up a series of switchbacks, we counted off the elevation with the GPS. We were shocked to see date palms at 4,500 feet. Eventually the road was atop a narrow ridge which dropped off on either side to drainages, one quite deep. Finally, after some hair-raising turns and abrupt dropoffs, we reached the very gradual

summit of Tizi n'Tichka Pass. The summit (7,400 feet) was rather anticlimactic after the steep ascent. Stopping to explore the flora, we were saddened at how overgrazed the hillsides were. The only plant of interest was *Ononis spinosa* or a close relative. Its pretty pink pea flowers were protected from the grazing goats by vicious tan spines. Disheartened, we drove down the gradual south side of the pass to an area where a small stream ran under the road. A quick investigation revealed several interesting plants. The first was a yellow *Chamaecytisus* (low-growing broom) covered in yellowish flowers. Unfortunately, the seed was not ripe. Along the stream itself we were astonished to find an old friend, *Eryngium varifolium*. Mike had tried growing it in Colorado, only to find it short-lived. He could see what he was doing wrong: in its native home it grew in very moist soil, but he had been treating it as xeric. Sharing the moisture was a grayish-green mint (*Mentha* sp.) that released a delightful smell when stepped on. We will fondly remember all the hikes in the western High Atlas for the minty smell that filled the air anytime we walked along a stream. Guarding the mint and *Eryngium* was *Cirsium chrysanthum*, the endemic thistle of the High Atlas, rather attractive with its showy golden spines and large stature. Above the tree line it was the tallest plant, sometimes reaching 4 feet.

We drove many miles over good roads toward Ouarzazate, our next destination. Along the way we collected some *Nerium oleander* seeds from plants growing at over 6,000 feet. We hoped that the resulting plants would be cold-hardy, and we passed the seeds on to Cistus Nursery in Portland, Oregon, when we returned. We also stumbled upon a bright red boraginaceous plant huddled low to the ground. Both the *Nerium* and borage relative had ripe seed. It was satisfying finally to collect from this high and scenic area.

We turned off the fine asphalt highway onto a gravel road and headed toward Telouet, where a former regime had had a retreat, or as Moroccans call it, a kasbah. We took a tour of these ruined buildings, which were abandoned in 1966, and marveled at the still beautiful mosaics. The buildings were festooned with storks' nests. It was near dusk when we left the kasbah, but we figured that we would simply get back on the asphalt roadway and proceed to Ouarzazate. We were sorely mistaken. The road got worse and worse and soon became, as Rodger described it, "a cowpath" running along the cliffs above a canyon. We drove for hours as it got darker and darker. Finally we reached the asphalt highway and headed for Ouarzazate. Exhausted, we finally arrived in the town, located a hotel, ate a quick dinner, and went to bed. Ouarzazate is on the Sahara side of the Atlas Mountains, though not technically in the Sahara, as there is one low range of hills between the town and the desert.

The village of Telouet sat in a spectacular location. Bright green fields of corn and other crops created a stark contrast to the reddish kasbahs (essentially, fortified palaces) and gray, treeless mountains. The main Touelet kasbah was a treasure. Reddish earthen walls gave no hint of the beauty hidden inside. After one enters, the rooms become more and more elaborate, with the harem and main reception rooms decorated in beautiful tile and marble. The most elaborate rooms date only from the 1920s, but since the kasbah was abandoned in

1956, little has been done to preserve the building itself. Many of its older earthen parts are simply eroding away.

From Telouet we took the “main” road down the valley to Ouarzazate, which turned out to be a bad idea. The road was too narrow for comfort, let alone two passing vehicles; but the scenery was worth the trouble. Picturesque Berber settlements stretched down an emerald valley guarded by reddish cliffs. The valley was filled with date palms (*Phoenix dactylifera*). After nearly three hours we reached pavement just in time to save the last of our nerves. The last hour was on good highway to reach Ouarzazate, which, like Ifrane, could be called a product of the French Protectorate. Little more than a kasbah before 1920, the town grew as an important French garrison built to subdue the Berber tribes of the southern mountains. Today Ouarzazate is known more for its movie studios than for its garrisons; *Kundun* was filmed nearby. In addition, the city is known as the “gateway to the Sahara.” Though it was hot, the real Sahara is on the other side of the Jebel Sarpho, a major mountain range.

We got up early and headed westward along the base of mountains. After an hour or so of driving we passed a small, dilapidated gas station in the middle of nowhere, with a huge sign that said (in English) “Last Gas for 200 miles.” We were quite amused at another reminder of the Great Basin here in south central Morocco. We knew that the sign was false, because the map showed Tazenakht about 50 miles farther on, so after snapping a few pictures we headed on toward our destination, Imlil. Leaving Ouarzazate, we headed westward toward Tizi n’ Test Pass to recross the High Atlas, hoping to make it that night to Imlil, the base town for Jebel Toubkal, the highest mountain in the Atlas. We spent the first few hours crossing barren areas that reminded us of Nevada. Reddish-brown mesas and mountains rose in all directions, disappearing into the heat haze. Occasionally a grove of date palms or tamarisk added bits of green. We passed through Tazenakht and noticed hundreds of carpets displayed at every store, gas station, and wide place in the town, a regional center for the carpet cooperative. The nomadic Berbers bring their carpets here for sale, and the cooperative assists them in getting a fair price for their work.

After Tazenakht the road began to climb over a pass of around 6,000 feet. Despite the increased elevation, the vegetation did not become any more luxuriant. A lax pink *Dianthus* grew out of the cliffs along the road where goats could not get to it. On the far side of the pass, a few scattered and tortured clumps of *Chamaerops humilis* appeared. Near the town of Taliouine the vegetation became more plentiful; dried grasses and spiny shrubs broke up the monotony of brown soil and rocks. We guessed that winter rains off the Atlantic are more pronounced here. Finally, near Aoulouz, the famous argan trees started to appear. *Argania spinosa* is endemic to a limited area of south central Morocco. Lending a true African savanna appearance to the landscape, these trees are prized for the expensive oil they produce. Continuing west, we passed through a very productive region growing saffron crocus and citrus crops.

Finally the High Atlas appeared through the haze, and the turnoff for Tizi n’ Test Pass neared. We left the plains and quickly climbed the southern slope of

the Atlas. Soon groves of *Pinus halepensis* planted for timber and erosion control replaced the argan trees on all but the hottest slopes. Around 4,500 feet, we pulled over to have a look at the vegetation. This site proved to have perhaps the most Mediterranean feeling of all the places we collected. Among a plantation of *Pinus halepensis* grew the most robust *Chamaerops humilis* we had yet seen. A covering of tan grasses complemented gray-green *Lavandula* and *Cistus*. Further inspection revealed the presence of a large bulb, probably a spring-blooming *Urginea* (now *Drimidia*) or *Asphodelus*; it had long since entered dormancy to avoid the torrid summer, but thick, withered brown leaves and a 3-foot stalk of ripe seed gave its location away. An unidentified *Allium* was also found in seed; it may be of the *A. paniculatum* type.

Climbing through the pine plantation, we made our way to the top of the ridge, where *Chamaerops* formed large colonies with a scattering of *Argania spinosa*. This was the last time and the highest location where we saw *Argania*. A lovely gray-leaved *Teucrium* was in ripe seed among the grasses. Feeling that we had exhausted the site, we made our way back to the car and continued on our adventure.

Climbing ever higher, the road snaked up the slope with narrow, tight turns. Views of both the surrounding countryside and the road below gave no shortage of thrills. Once in a while a small cascade poured onto the road, edged with pink *Nerium oleander* and purple *Trachelium*. Climbing higher, *Chamaerops* was still with us. Here at 6,000 feet it must see a fair amount of cold and snow in the winter. Despite this rather unorthodox location for a palm, these were even more robust than their counterparts below. Both the green and silvery blue forms were present, and most colonies had developed small trunks to about 4 feet high. This was the first time we saw the palms form actual trunks. Stopping near the summit to look for carpets at some tourist shops, we were shocked to see more *Chamaerops*. Would they be at the summit just a few hundred feet above?

Finding no carpets to buy, we continued to the summit, which at 6,800 feet proved rather anticlimactic. Junipers and evergreen oaks closed in, forming a dense forest, with only a few *Chamaerops* out of reach on the road cuts. Mike's heart sank at the lack of accessible palms. It had become his mission to collect seed from this high location. A convenient pulloff just over the summit raised his spirits: *Chamaerops* appeared within reach just below the road. A quick assessment of the situation ended with Tom tying a rope around Mike's waist and Mike sliding down on his bottom to the treasure, which happened to have seed. Within seconds he was embracing the palm several hundred feet above the valley floor, and with a couple of quick twists, we had ten seeds or so. We also noticed a strange mistletoe growing on a juniper tree and stopped to collect samples and take pictures. Tom pulled Mike back up to the car, and we went on our way.

Following a stream downward, we reached the first villages in the valley bottom. Date palms once again graced the roadsides; no doubt this valley is rather mild. We continued on until we reached the Tin Mal mosque. The mosque is not in use currently except on Fridays, and so non-Muslims are allowed to enter it. It was built in 1156 and is being restored. We had arrived there after it was

technically closed, but with luck the caretaker was still there and let us in. The architectural symmetry, the beauty of the mosaics, and the peacefulness of the location were unforgettable. Our goal of Imlil still lay at least an hour away, and the sun was getting ready to dip behind the mountains.

Continuing down the valley to Asni, we turned up a smaller valley toward the highest peaks in the Atlas and the village of Imlil. In the dimming light, the high peak in front of the Jebel Toubkal massif revealed a small snow patch on the highest slopes. Cool air soon filled the car, helping us to forget the heat and the long day on the road. Reaching Imlil at dusk, we found a town filled with tourists with two purposes: to escape the heat of Marrakech, or to climb Jebel Toubkal, the highest peak in North Africa at 13,682 feet. Imlil is at the end of the road and, at 5,700 feet, would put us within walking distance to Toubkal and its neighboring peaks. After taking too many photos, we headed on toward Imlil. We found our hotel, Café du Soleil, and had dinner. Sitting out on the patio afterward, we noticed music drifting down the valley. We went to investigate and found young people beating drums and singing Berber songs. The night sky was clear, the temperature was comfortable, and the music reverberated down the valley. The singing was still going on when we walked back to the hotel. We had to get a good night's sleep, because we were heading to the refuge on Jebel Toubkal in the morning.

We arose early and packed our things for a very strenuous hike up to the refuge. The refuge is over 5,000 feet higher than the village. The hike began by winding past small shops near the hotel and ascending through the walnut orchards that surround the village. We passed the fabulous kasbah, a destination for international jet-setters. Interesting plants soon began to appear. In rock outcrops along the path, *Salvia taraxacifolia* was still in bloom while ripe seed made a collection possible. This was one of the plants Mike had most hoped to see. Though the pale lavender flowers were not as showy as hoped, the presence of both ripe seed and new flowers on the same stalk testified to its long season. Not far beyond it we came upon another treasure of the Atlas: *Pteroccephalus depressus*, a single specimen covered in fuzzy seedheads. *Convolvulus sabatius* glowed in a crevice with quarter-sized blooms of strong blue-purple. Crossing a dry streambed, we began the real climb. There were few plants of interest in this section of the trail—only a scattering of *Juniperus thurifera* and an understory of goat-proof plants. Since it was still morning, the pale orange blooms of *Papaver atlanticum* offered some color; the heat of midday would later cause the petals to drop.

We continued up a rocky river valley once filled by a glacier and began the steep climb up the mountain. Rodger began to feel ill, and rather than continue hiking, he hired a mule and rode up to the refuge. Mike and Tom continued walking. Climbing ever higher, we crossed the main stream rushing down from Toubkal. Among the rocks grew an assortment of moisture-loving plants, but few of horticultural interest. Above the shrine of Sidi Chamharouche we passed above the tree line into the world of frozen hedgehogs. Cushions of spiny *Eri-nacea anthyllis*, *Ptilotrichum spinosum*, and *Genista balansae* grew on the rock-strewn

landscape. Here and there the bright blue form of *Delphinium obcordatum* added color; it did not have any ripe seed—too bad, as it was far superior to the pale lavender form we had seen near Ifrane. In an area of large boulders we saw a bright pink *Dianthus* (perhaps *D. sylvestris*) beckoning from crevices out of reach of goats. A quick stop produced a fair amount of seed. Continuing to climb, we passed small seeps where *Eryngium variifolium* and a creeping yellow *Ranunculus* added spots of color to the browns, tans and greens of the surrounding vegetation and rocks. We noticed that goats and other grazers were present even at increasingly high elevation; we had assumed herders didn't bring their flocks so high, but that appeared to be a false hope.

We wound up the path and after about 4 hours we reached the refuge. Above rose stark peaks of dark brown stone, laced with snow patches in sheltered areas. Behind us the nearer peaks closed in to hide the view of the valley below. Clouds gathered overhead and rain threatened as Tom and Mike reached the refuge. Rodger was still ill, so after checking on him and dropping off their heavy packs, Mike and Tom had some badly needed refreshment and then continued up the mountain to look for ungrazed areas. Everything seemed to have been affected, though. Finally we discovered an isolated canyon at about 11,000 feet and decided it might be somewhere the goats hadn't reached. It had waterfalls on both ends and steep rock walls that we thought would at least slow them down. It was time for dinner, so we returned to the refuge, determined to return the next day and explore this canyon.

After resting and regaining our strength, we climbed onto the scree above the refuge to see what plants we could find. At first glance the valley appeared devoid of plant life; only along the stream did thickets of *Cirsium chrysacanthum* offer greenery. On the slope to the right of the refuge we were treated to the last flowers of *Ptilotrichum spinosum*, as well as ripe seed. Here at more than 10,000 feet the plants were near their elevational limit. Some forms had rich rose-pink blossoms, much deeper in color than the usual form seen in gardens. Scattered around the scree was a delightful little *Linaria* with flowers of brown and purple with reddish veins, *Linaria lurida* var. *tristis* (p. 330). Unfortunately we only saw a few plants of it, and none had seed ripe enough to collect. In moist shaded areas out of reach of goats we found *Myosotis alpestris* subsp. *albomarginata*, very similar to the European form. Keeping company with the blue *Myosotis*, *Bellium coerulescens* added delicate white daisies. Mike climbed along a rock ledge to reach crevices that the goats had ignored. Here a delightful miniature flora revealed itself, with *Rhodanthemum atlanticum* var. *gelidum* by far the most showy. *Draba oreadam* bore ripe seedheads above its furry cushions. *Erigeron maieri* offered both seed and fresh flowers, and delicate *Cystopteris fragilis* graced the crevice with its fronds.

Tom and Mike were on a mission to find *Gentiana verna* subsp. *penetii*. Archibald mentioned finding it in a few moist, peaty spots along streams and seeps in the high valley. Whenever we found a moist, grassy area, we scanned for the leaves of this choice plant. The Toubkal massif is the only area in the Atlas where it is known to occur. Failing to find the *Gentiana*, we searched one more moist area near a few large boulders. The crevice of one held a beautiful, delicate

white *Viola* (p. 331). This was the only time we would see it, and the seedpods proved empty. Following the creek down, we came across a small canyon about 30 feet deep. It was getting late, but this was a promising place to start in the morning.

Back at the refuge, the staff prepared dinner while we lounged on the patio and talked to other tourists from Poland, the United Kingdom, Spain, France, and the United States. That day happened to be the king of Morocco's birthday, and there were bright red banners out announcing the fact. The next morning found us packing for the ascent to the refuge at the base of Toubkal. Jim Archibald had climbed into this area in the 1960s and mentioned finding many interesting high-elevation plants. Would many of them remain after more than 40 years? After breakfast we hoisted our packs and begin the 4-mile climb to the next refuge. At around 10,000 feet above sea level, it lies high above the tree line in an area of great scenic beauty.

The next morning Rodger felt a little better, but he was still not up a hike, so Mike and Tom left to explore the canyon. We also wanted to climb up to the snow line and see what we could find. The canyon was not the botanical wonderland that we had hoped for, but it was much better than the surrounding area. We had great difficulty getting into it, as there were thick clumps of thistles growing at the only access point. We inched our way down into the canyon and collected *Arenaria purgans*, a diminutive *Linaria*, a *Stachys*, a *Viola*, a *Cardamine*, and *Ptilotrichum spinosum*. Tom photographed while Mike collected seed and spore from several different plants.

We decided to continue up the mountain, but no matter how high we went, there was continued evidence of goats. What had once been beautiful alpine meadows had been grazed to the ground so many times that nothing remained but gravel and a very few remnant spiny plants.

Not quite ready to give up on *Gentiana verna*, we climbed farther up to a small hanging valley at the base of Ouanoukrim, the neighboring peak to the southwest of Toubkal. Reaching a level area just below a small snow patch, we found what closely resembled *Viola drypis* (p. 331). This small, delicate viola with pale lavender flowers bears a striking resemblance to the rosulate violas of the Andes. Here it grew in scree with almost no competition, the whole plant being no more than 2 inches across. Stopping to take picture of the "African snow" on the last day of July, we pushed a little higher to another small moist area where we hoped the *Gentiana* might reside. Heart pounding from both excitement and the climb, I searched the wet peaty ground for anything that resembled a gentian leaf, but only blue *Veronica repens* var. *cyanea* and the yellow *Ranunculus* seen earlier offered color in the heavily grazed sedges and grasses.

Storm clouds gathered over Ouanoukrim, and not wanting to get caught in whatever was on its way, we retraced our path back down to the main trail. Despite our best efforts we were soon caught in a cold rain. We hiked back down to the refuge, finding Rodger well enough to ride back on a mule. He took our packs with him, making our descent much easier. We were a bit concerned that it might rain hard and make the trail impassable, but it only misted on us as we hurried down toward the sun-washed lower peaks, finally leaving the rain



Seed-hunters traveled far through the Moroccan landscape (p. 315). (photos, T. Bland)

“Hedgehogs,” dense, spiny plants, are typical of arid, goat-bitten land.





Linaria lurida var. *tristis* (above; p. 327) and *Ononis cenisia* (below; p. 320) were still in flower during the seed-hunting season. (T. Bland)





Only one plant of this delicate white *Viola* was seen by the explorers (above; p. 328).
Viola drypis (below; p. 328) is another Moroccan crevice dweller. (T. Bland)





The dramatic landscape of the Slovak Karst (p. 347);
see also the back cover. (photos, T. Boland)

Alyssum montanum is a Karst native popular and easy in rock gardens.





Spring flowers of moist or shady areas in the Karst include *Primula elatior* (above; p. 349), *Primula veris* (below left; p. 349), and *Dentaria glandulosa* (below right; p. 348). (T. Boland)



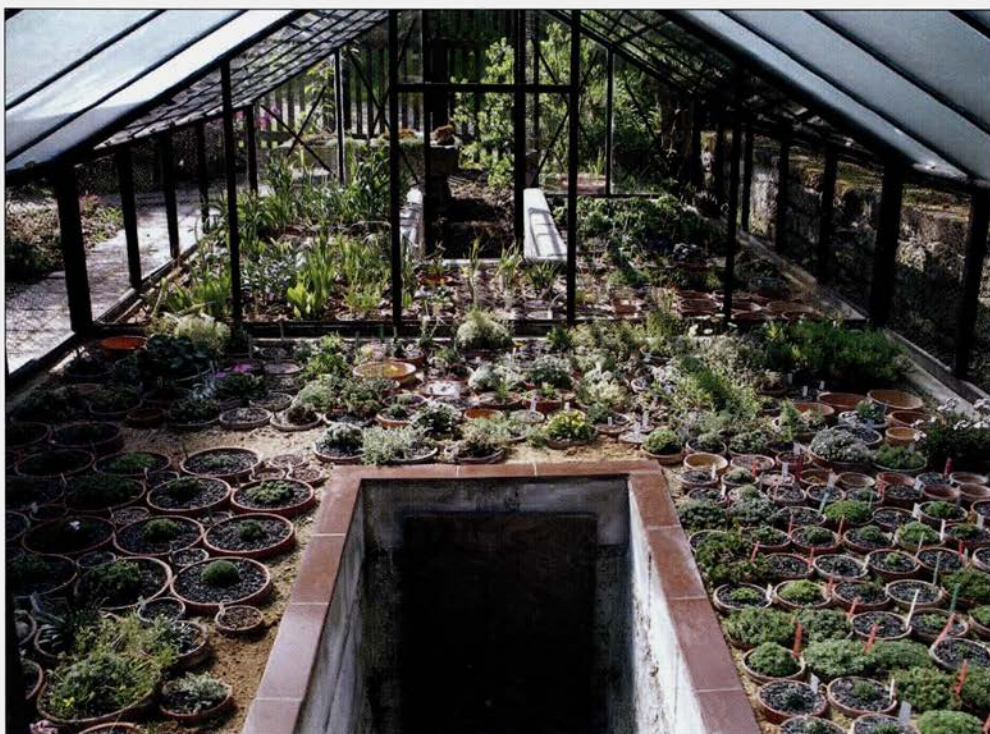


Brightening the Karst in spring are *Chrysosplenium oppositifolium* (above, p. 348) and the prostrate broom *Cytisus hirsutus* (below; p. 349). (T. Boland)





The rock garden and alpine house of Jiří Novák in Pardubice Svitkov were visited by participants in the international rock garden conference (p. 351). (photos, Juliet Mattila)





More scenes in Jiří Novák's garden (p. 355). (J. Mattila)





The garden of Zdeněk Čančara near Sedloňov, Czech Republic, was designed by Josef Halda (p. 355). (J. Mattila)

Oxalis enneaphylla in the alpine house of Dr. Oldřich Maixner in Sedlec, Czech Republic.





Mature specimens of alpine plants – *Minuartia*, above, and *Gypsophila aretioides*, below—feature in the rock garden at Schloss Belvedere in Vienna, Austria (p. 356). (J. Mattila)



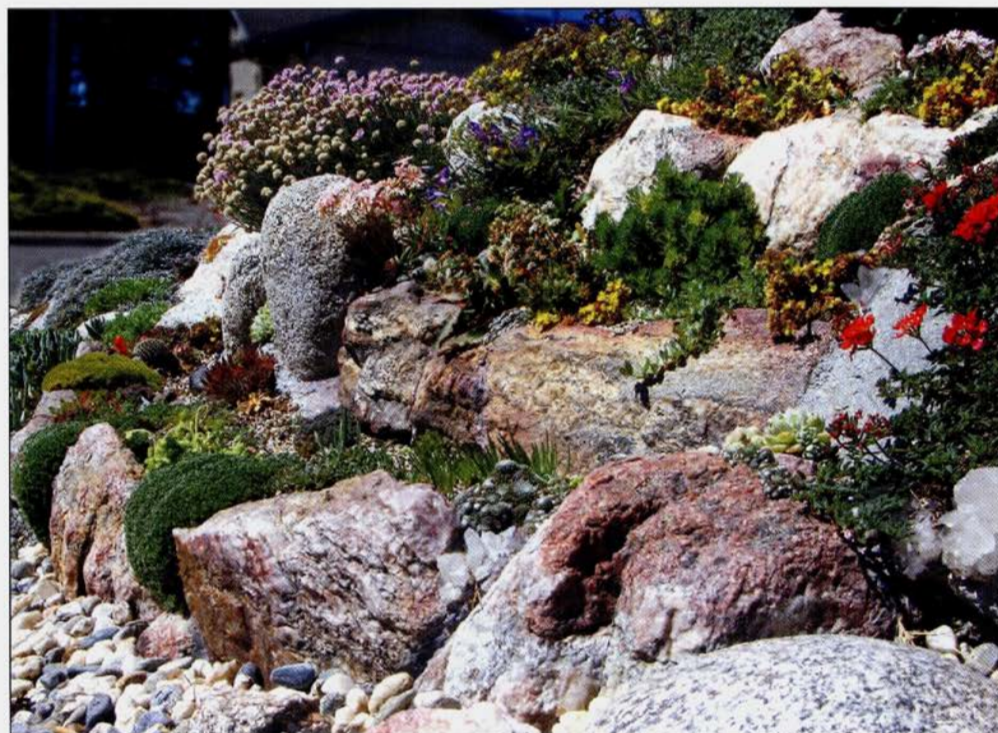


The forms of plants and rocks harmonize in the Schloss Belvedere alpine garden. (J. Mattila)



The birdbath in Jack Muzatko's "non-traditional" rock garden (p. 359); this remarkable scene earned first prize in class 4 in the 2006 photo contest. (J. Muzatko)

A slope in the Muzatko garden features a wide variety of tiny plants (p. 359).





Another constructed outcrop in the Muzatko garden. (J. Muzatko)

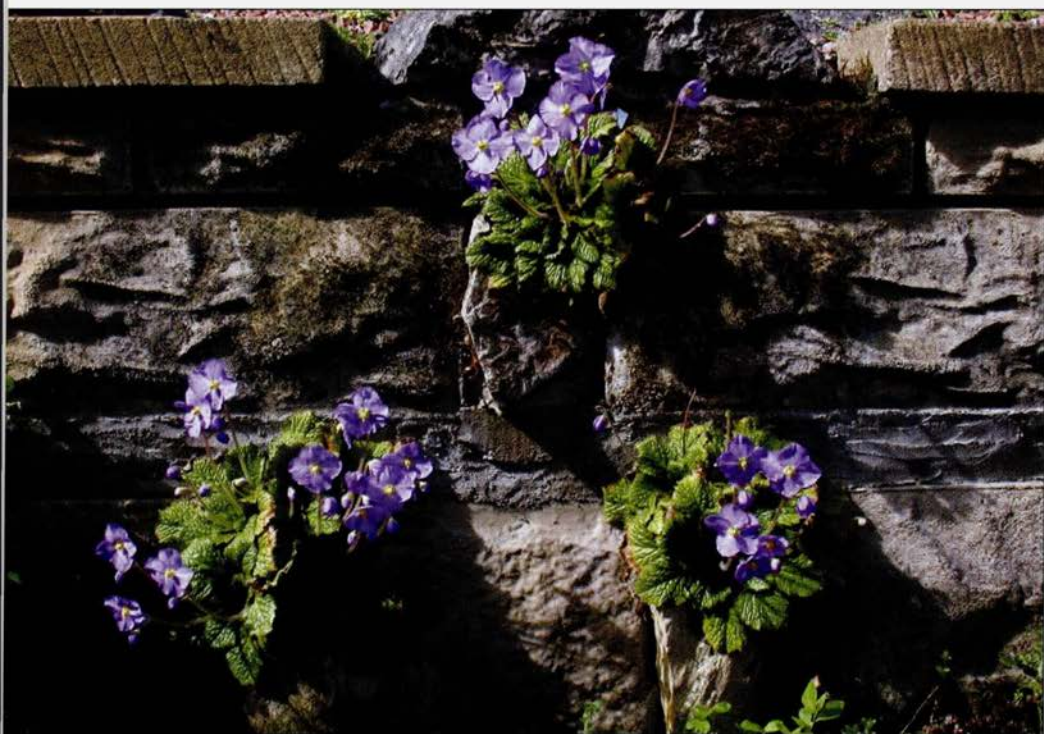
Two steps in the construction of a rock garden cascade (p. 360).





Denis Hardy's planted masonry wall above a flagstone patio (p. 357). (D. Hardy)

This photo of *Ranonda nathaliae* in the wall received second prize in class 4 of the 2006 photo contest.





Kalmiopsis leachiana, often a crevice plant in nature, ornaments Denis Hardy's masonry wall (p. 358). (D. Hardy)

Lewisia 'Little Plum' (left), introduced by Denis Hardy, and *L. tweedyi* (right) flourish in planting holes in the wall (p. 358).





Jānis Rukšāns's new book *Buried Treasures* (review, p. 372) describes the origins and cultivation of many Juno irises, including the hybrid 'New Argument' (above) and *Iris rosenbachiana* 'Harangon' (below). (J. McGary)



behind. Dropping rapidly, we stopped only to collect seed of *Papaver atlanticum* and *Convolvulus sabatius*. We reached Imlil after about 4.5 hours and were much relieved to have food and rest. After a little shopping, we made plans for the next day.

The Toubkal area was the highest we would visit on the trip. Despite the many interesting plants we found, we felt disappointed at not finding the *Gentiana*, several saxifrages, and some of the other treasures Archibald mentioned. We would turn our attention the next day to the west, with Jebel Erdouz and eventually Lalla-Takerkoust as our destinations.

The next day we headed toward Lalla-Takerkoust, a village situated on a reservoir in the lowlands not far from Marrakech. On the way, our goal was to stop at Azegour, a small village, and hike to a collecting site that Randy and Rod had located at an abandoned village. We drove to Amizmiz, where it was market day, and Rodger carefully threaded the car through throngs of people and animals. After a few wrong turns, we ascended a dirt road through a forest of Aleppo pine. There was no traffic on this road, but we gave no thought to that because we were in a remote area. We continued for some miles, until we rounded a corner and came face to face with earth-moving equipment. The road was completely blocked by a huge pile of rocks. The road crew was widening the road, clearing and blasting as they worked their way up the mountain. We now realized why there had been no traffic. Rodger discussed the situation with the road crew in French, and eventually they volunteered to clear a path for us to pass. After what seemed like an eternity in the hot sun, the path was cleared and we continued. After several more miles we came upon two signs facing the other direction, indicating that the road was closed due to construction. We drove on, after a chuckle. The road got worse and worse and finally came to a dead end under an enormous walnut tree.

We got out and went collecting. Rod and Randy had given a GPS location for the collecting site to Mike, but it was only approximate. Climbing up a shale slope, we found tons of *Pteroccephalus depressus*, but without a single seed or blossom. After heading up the wrong valley, we climbed over a ridge and descended toward the parallel (correct) valley. It began to rain, and the steep walls of the valley became slippery. After nearly breaking our necks, we found a path down and continued up the valley to an abandoned village, where we finally reached the waypoint for *Rhodanthemum catananche*. This plant has large daisy-like flowers of buff and apricot. The goats, however, seemed as fond of the seed as we were, and exhaustive searching yielded few seeds. We thought that it would be a quick hike from the car and had not brought much food or water along. We found an apricot tree and ate lots of the tingly, sweet fruit. We found the site where the plants had been seen in bloom, but alas, the goats had been there first and had eaten most of the seedheads.

The hike back to the car was much quicker, and we headed on to Lalla-Takerkoust. We stopped along to photograph a late-blooming *Urginea maritima* (no ripe seed). After trying several hotels that had no vacancies, we found Dar Ouzquita. It was over 100° F, and we were tired and hungry after a long day. The

hotel was run by a Frenchman of Russian parentage who spoke only Russian and French. Rodger arranged rooms, and to our delight they were air-conditioned. We had a great dinner on the terrace overlooking the reservoir, the restaurant being named Les Jardins d'Eden, complete with alcoholic drink—no small treat for Westerners in a Muslim country. The power kept going off, but it added to the ambiance.

After a delicious breakfast the next morning, we headed for Marrakech. Our trip was winding down. We had one last day in Marrakech together, and then Tom would take the night train to Tangier and the ferry to Algeciras in Spain. Rodger and Mike would fly back home. We toured the city and had a last dinner before going our separate ways. A most memorable Moroccan adventure!

We had seen beautiful scenery and interesting plants and met interesting as well as kind and helpful people, but in the end we had missed a few of the plants we had hoped to collect, or at least see. Overall, we were able to collect seed of around 100 species. Returning to the heat and commotion of Marrakech, we started to clean and prepare the seed for shipment back to the United States. Despite all the area we covered, we felt that we saw only a sampling of the rich flora that Morocco has to offer.

Note: This article is the editor's combination of separate accounts submitted by Tom Bland and Mike Kintgen. The botanical details were provided mostly by Kintgen, and much of the cultural commentary by Bland.

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A Trip to the Slovak Karst

Todd Boland

When many alpine enthusiasts plan visits to Europe, they often try to incorporate a trip to the Alps, be it in France, Italy, Switzerland, or Austria. Some other places to see spectacular alpinists are the Pyrenees of Spain and France, the Dolomites of Italy, and Mount Olympus in Greece. I was never one to follow the crowd; thus, when I planned my trip to Europe, I wanted to visit an alpine area that was off the beaten track. With my love of bird-watching, I also wanted to visit an area with a plethora of bird species. The best of both worlds presented itself in a visit to Slovakia, and the Slovak Karst region in particular.

Slovakia is primarily a mountainous country. In fact, nearly two-thirds of the country is covered in mountainous terrain. On the northern boundary with Poland lie the High Tatras, with some 20 peaks that extend above 2500 meters. The central part of the country is covered by the Low Tatras, with most peaks below 2000 meters. Both ranges are part of the larger Carpathian Mountains, which extend from the Czech Republic through southern Poland, Slovakia, Ukraine, and Romania. An interesting fact about the Low Tatras is that nearly 200,000 hectares are state-protected, making it the largest protected area anywhere in the Carpathians. In the southeastern part of the Low Tatras, specifically along the Slovenske Rudohorle ridge, is a tableland of eroded limestone that exhibits some of the world's best examples of karst topography. Owing to its unique geological formations, this area was designated a World Heritage Site in 1995. In 2002, to protect the wildlife and, in particular, the many endemic plants, this 55,800 hectares of karst was protected as the Slovak Karst National Park.

So what is karst topography? The most notable feature is the frequent occurrence of sinkholes or dolines. These natural depressions, often water-filled, form as water dissolves soluble limestone bedrock, leaving behind a pock-marked landscape. Within the Park, many of these sinkholes are over 100 meters across and 20 meters deep. Most rivers here run underground, forming more than 700 limestone caves, the largest of which is over 21 kilometers long. Rugged, sharply eroded limestone outcrops are common atop the plateaus and can make for

some hazardous hiking. It was to this area that I made a combination bird-watching and plant exploration trip in early May of 2005.

The forest of the Slovak Karst National Park is primarily deciduous, composed of hornbeam (*Carpinus betulus*), sessile oak (*Quercus petraea*), beech (*Fagus sylvatica*), and ash (*Fraxinus excelsior*), with a scattering of Norway maple (*Acer platanoides*), sycamore maple (*A. pseudoplatanus*), and linden (*Tilia cordata*). Understory shrubs include cornelian cherry (*Cornus mas*), hedge maple (*A. campestre*), hazel (*Corylus avellana*), one-seed hawthorn (*Crataegus monogyna*), privet (*Ligustrum vulgare*) and February daphne (*Daphne mezereum*). More than 900 species of plants have been recorded in the Park. The climate is classified as humid continental, with lowland winter means of -3°C and summer means of 19°C (25° and 68°F). The higher elevations, at 500–1000 meters, have a January mean of -7°C and a July mean of 14°C (20° and 57°F). Annual rainfall ranges from 700 to 1100 mm (28–44 inches). For us alpine gardeners, it means that the plants encountered in this area may be cultivated in many parts of North America; and as will soon be revealed, many of us are already growing these plants.

The alpine flora contains both plants characteristic of the Carpathian mountains and species of alpine regions farther south along the Mediterranean. In the Park, the Carpathian alpine plants are found mostly on the northern slopes and cool, shaded ravines, while the Mediterranean plants are restricted to dry, south-facing cliffs. I was fortunate to experience this juxtaposition of alpine plants when I visited the Zadiel Gorge and hiked the 6-km trail that loops from the bottom of the gorge to the top of the 900-meter plateau.

As I entered the shaded gorge, the first plants to catch my eyes were the many small ferns clinging to the canyon walls. Among them were fragile fern (*Cystopteris fragilis*), spleenworts (*Asplenium trichomanes*, *A. septentrionale*), rock polypody (*Polypodium vulgare*, *P. interjectum*), alpine woodsia (*Woodsia alpina*), and beech fern (*Phegopteris connectilis*), many of which were already familiar to me in Newfoundland. Perhaps the most common groundcover was *Oxalis acetosella*, which in early May helped brighten the otherwise dark forest floor with its many white, pink-veined flowers. Also abundant and in full bloom were sweet woodruff (*Asperula odorata*), wild ginger (*Asarum europaeum*), *Chrysosplenium oppositifolium* (photo, p. 334), and *Hacquetia epipactis*. I was lucky to find, in bloom, two Carpathian specialties that inhabit only these cool ravines; *Soldanella carpatica* and *Dentaria glandulosa* (photo, p. 333). Higher up on the cliffs, where the light was brighter, green tufts were growing vertically in the limestone cracks. My binoculars revealed them to be Carpathian harebell (*Campanula carpatica*), in bud but not yet open. I could only imagine the wonderful picture they would present in the upcoming weeks.

The first kilometer of the trail was relatively level, then it gradually started to ascend. Another half kilometer, and I left the gorge and entered the switchbacks that traverse the forest en route to the more exposed plateau. The dappled shade of the deciduous forest allowed a greater diversity of woodland flowers. The first week of May presented a lawn of white on the forest floor: multitudes of *Anemone nemorosa*, *A. sylvatica*, *Isopyrum thalictroides*, *Trientalis europaea*, and *Maianthe-*

mum bifolium. Peppered here and there were specks of pink or blue from *Hepatica nobilis* and *Pulmonaria officinalis*.

Near the bottom of the hillsides, seepage areas were quite common. Such areas had their own delights. Bright yellow *Caltha palustris*, *Ranunculus auricomis*, *Geum urbanum*, and *Anemone ranunculoides* were dominant in these areas, along with *Cardamine bulbifera*, *Lunaria rediviva* and *Viola riviniana*. However, I think my favorite plant in these woodlands was *Paris quadrifolia*. I have seen pictures of this European relative of our American trilliums but never dreamed I'd see one for real, and in bloom to boot! While not a floral knockout with regard to color, the four narrow, green bracts and petals combined with eight narrow stamens lend this woodlander a starburst effect that is exquisite.

Near the crest of the plateau, the trees gradually thinned out and the ground became more rocky. It was obvious that the soil was becoming drier, too, as the woodlanders lower down gave way to a new group of plants. Suddenly, the dominant plant in flower was spring vetchling (*Lathyrus vernus*) with pink to purple flowers. I was even fortunate to find a white form. *Viola rupestris*, *Euphorbia polychroma*, *E. amygdaloides*, *Lithospermum purpureocaeruleum*, *Symphytum tuberosum*, *Allium ursinum*, *Scilla bifolia*, and *Fragaria moschata* were among the other spring wildflowers I found blooming near the plateau ridge. Damp pockets were still evident from the many oxlips (*Primula elatior*) and cowslips (*P. veris*) that grew in this more open area (photos, p. 333).

Once I was atop the plateau, the vegetation dramatically changed. Although discouraged, local farmers still allow their sheep and goats to graze the plateau, so there are few trees here. The terrain is very rocky, with many eroded limestone outcrops. The only shrubs present were those with spines to deter the grazers, including gorse (*Ulex europeaus*) and sloe (*Prunus spinosa*), or toxic shrubs such as brooms (*Cytisus hirsutus*, photo, p. 334, and *C. scoparius*). Most of the herbaceous vegetation was grasses, but in early May there were two very dramatic plants (probably toxic) that seemed to survive the herbivore onslaught: *Pulsatilla grandis* subsp. *pseudoslavica* and *Adonis vernalis*. The pulsatillas were in seed with large, showy, spherical heads that measured nearly 15 cm (6 inches) across, reminiscent of the popular *P. alpina* subsp. *apiifolia*. The adonis was in full flower. This spectacular alpine has been a heartbreak for me; I have tried to grow it from seed numerous times, with dismal results. The plants here were huge, with 20 or more flowers per plant. If I had seen no other alpiners on this trip, seeing the adonis would have made it worthwhile.

After the initial shock of seeing so many adonis, I began a more thorough examination of the flora. Other blooming plants I found in these meadows were *Lathyrus pannonicus*, *Potentilla argentea*, and *Artemisia absinthium*, along with the silvery rosettes of *Lychnis coronaria*. Bordering the water-filled sinkholes were narrow marshy bands that were home to a multitude of orchids. Unfortunately, I was too early for most of these, with the exception of *Orchis morio* with eye-catching magenta flowers.

The true alpiners were restricted to a narrow band along the upper cliff edges of the plateau. These cliffs face south and can become quite dry. It is here that the

Mediterranean-affinity alpiners and several Slovak karst endemics occur. The most noticeable alpiners in early May were clumps of blooming *Alyssum montanum* subsp. *brymii*, *Draba lasiocarpa* subsp. *klasterskyi*, and *Primula auricula* subsp. *hungarica*, which clung precariously just over the rim of the cliffs. There were many other budding alpiners, including *Dianthus hungaricus*, *D. plumarius* subsp. *praecox*, *Onosma tornense*, *Iris aphylla* subsp. *hungarica*, *Iris pumila*, *Thymus pannonicus*, *Astragalus vesicarius* subsp. *albidus*, *Erysimum pallidiflorum*, *Linum flavum*, and *Campanula carpatica*. The *crème de la crème* was the scattered *Daphne arbuscula*, whose pink buds hinted at the beauty that would be revealed in short time. Had I visited a couple of weeks later, the multitude of flowering alpiners would have been mind-boggling.

Slovakia, as a whole, is perhaps one of the most untouched areas of Europe. As well as natural beauty, the country offers fascinating historical monuments in its many castles, chateaux, monasteries, and churches. But it is the outdoor enthusiast who would most enjoy Slovakia. Whether you are a cyclist, rock climber, hiker, hunter, fisher, skier, wildflower enthusiast, or birder, Slovakia can satisfy your every outdoor whim. With my keen interest in both wildflowers and birds, I found it as good an area as I could imagine. And while I haven't mentioned any of my birding experiences in this article, suffice it to say that the birding in Slovakia was every bit as exciting as the plants!

Todd Boland is curator of the Memorial University Botanical Garden in St. John's, Newfoundland, and a founder of the regional NARGS chapter there.

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The First Czech International Rock Garden Conference

Robin Magowan

In the past 25 years the Czechs have emerged as the acknowledged masters of rock gardening. The First Czech International Conference, sponsored by the Prague Rock Garden Club under the leadership of Vojtěch Holubec and Zdeněk Zvolánek and held in the ancient royal town of Beroun outside of Prague, offered a rare occasion to learn what their revolution has been about. The price was reasonable—less than \$100 a day for both the conference and hotel accommodation and the five subsequent days of bus trips to Bohemia's gardens.

Despite the early May date—a crucial time for a rock garden—the conference, limited by the lecture hall's 175-seat capacity, was fully subscribed. As we registered, we were handed a journal, edited by Joyce Carruthers, containing the whole 136-page Conference Report. With the matter thus digested, we delegates could sit back and let ourselves be tantalized by the slides: places we would never get to, and plants impossible to obtain, much less grow.

Unlike Holubec, who offered talks on the Caucasus and on China (including Tibet), I don't find it thrilling to be in high mountains. The landscapes that speak to me are man-influenced ones: steep, olive-terraced Mediterranean hill-sides; alpine meadows ornamented by the noise of streams and cowbells; the vast, continually changing garden that is rural France. Gardening is my way of putting down roots. My plants are the travelers, messengers bringing news from heights impossible to traverse.

Yet there were speakers like Finn Haugli, the retiring director of the Tromsø, Norway arctic rock garden, who made the gardens there and the regional ecology of plant communities seem well worth visiting. At the recent winter study week-end in Rochester I had heard Henrik Zetterlund's account of the various expeditions organized by the garden he directs in Göteborg. Using many of Zetterlund's slides, a young Dutchman, Gerben Tjeerdsma, gave a lively talk on the rationale behind several Middle Eastern forays: what they were looking for, what they discovered. Would you go looking for *Dionysia* in post-Hussein Iraq? It was instructive to see botanists negotiating a minefield, gingerly hopping from one semi-safe boulder to the next.

The venerable plantsman Fritz Kummert showed us a number of rarities he grew on his four-acre South Austrian garden. His notes are such that each plant came with a pedigree: where collected and who gave it—a memorial made all the more memorable by the old, sticky slides that confounded the projector. Finally, at 9:00 in the evening, there was the man who pioneered Czech crevice gardening, Josef Halda. What would he talk about? Some of the five hundred gardens he has built? The plants of Mount Evans in Irian Jaya, for which he has been compiling a flora? The volcanic Kamchatka of a remembered postcard? Josef astonished us with a tour of the plant eccentricities of Mount Kilimanjaro, a flora well worth experiencing, if a little outside our growable range.

Along with the reports from far-flung expeditions, there was a definite mesianic tinge to the conference. We were there, after all, to be converted. In this line we heard a brilliantly illustrated “History of Growing Alpines Outdoors in England” given by John Page, which might have been subtitled “from the Czech perspective.” Even more germane were Zdeněk Zvolánek’s two talks on Czech gardening: one, a history of rock gardening in the Republic; the other, on the evolution of crevice design in which he has played a leading role.

I had long assumed that the extraordinary success of the Bohemian Rock Garden Society, with its 14 chapters, its intrepid seed collectors, its famous shows, and its publications, was a Cold War phenomenon, prompted by the availability of travel in the unexplored reaches of the Soviet Union. After all, the Society came into existence only in 1970, two years after the failure of the Prague Spring.

Broadly speaking, I may have had a point. A closed society, with professional possibilities limited by the need to belong to the ruling party, could make for a dispossessed elite throwing themselves into one or another obsessive pursuit; what jazz was for the novelist Skvorecky and romance for Milan Kundera’s characters, rock gardening could be for other Czechs. Cram enough good people together and a discipline can take off. Plant exploration, too, created a fraternity. Travel in the Soviet Union required permits, but a number of gardeners, among them Zvolánek, never succeeded in acquiring any. While regional cities could be reached, the mountains remained everywhere off limits (though guarded by easily bribed military personnel). Nor was the formation of the Rock Garden Society, Zvolánek explained, a reaction to the events of 1968. To get ahead, let alone function in your profession, you had little choice but to belong to the Party. Some 70 to 80 percent of the Club were, at one time or another, Party members, and, like everything else, the meetings were monitored by the secret police.

It is difficult to reconstruct the history of rock gardening in the Republic, as the Communists destroyed the archives of the aristocracy. But the country is one well suited to rock gardening, with cool summer nights and the kind of continental winters that have fostered a nation of excellent hockey players. Much of the perimeter is mountainous, sealing off a Celtic people, the Boii as they called themselves anciently, from neighboring Poles, Germans, Austrians, Hungarians, and Slovaks. The mountains are granitic, with acid-soil foothills that do not encourage plant diversity. But Bohemia and Moravia’s lowlands boast considerable limestone or karst foundations, ideal for rock gardening.

The Republic has the enviable situation of being smack in the middle of Europe, and the disadvantage of having as its neighbor a big, ruthless, win-at-all-costs Germany. Yet the prewar culture that embraced Paris and was as advanced intellectually as any in Europe had an international bias favorable to rock gardening. When I asked Zvolánek what distinguishes the Czech mentality, he gave a one-word reply: "Hybridization." One is reminded of the fertile clash of German, German-Jewish, and Czech cultures in prewar Prague. Czechs can be nomads in the same way that the Swiss are, curious about what lurks outside their mountain boundaries.

We know that the great emperor Rudolf II had a garden. On an outcrop? But rock gardening certainly goes back as far as Gregor Mendel, a monk from Brno who discovered the principles of genetic inheritance by hybridizing peas. We know that Count Sylva-Tarouca constructed a very large "alpinum" in Pruhonic at the turn of the last century. Perusing Bohumil Hrabal's novel *I Served the King of England*, a sub-rosa indictment of the apparatchik mentality, one gathers that no grand hotel was without its rock garden. The wife of President Edvard Beneš was an avid rock gardener. The demand for plants was such that the country had four specialized rock garden nurseries. Karel Čapek's charming *The Gardener's Year* (1929), a classic of garden writing, provides a witty view of the rock gardening ferment.

The Communist takeover in 1948, with the brutal defenestration of Čapek's great friend Jan Masaryk, tossed everything topsy-turvy. With all exchanges with the West forbidden and no way to pursue a calling, non-Party members were reduced to a species of bricolage, experimenting with anything that might make ends meet. Josef Halda is an outstanding example, an intellectual of very wide interests who pioneered a revolution in garden design. While progress in this period was made in tufa gardening and the hybridization of certain species—saxifrages, notably—garden rockwork remained in the state Čapek described 50 years earlier:

It is called the Alpine garden probably because this part of the garden gives its owner opportunity for performing hazardous mountain feats . . . in order to be able to plant, till, poke and weed among the picturesque and not altogether firm stones of the garden.

"Picturesque" is the key word here. Garden stonework figured as a form of punctuation, more ornamental than structural—hence the hazards of gardening among insecurely wedged boulders. The placement of stone did little to give high-altitude plants the cool root run and protection from winter wet they need to survive in a lowland environment.

The showcase for rock gardening over the years has been the May show of the Prague Rock Garden Club. One of three events the Club puts on—the others are in late March and early September—it takes place in a yard rented from a church in mid-town. As many as 250,000 people have been known to attend, and the shows, with their plant sales, pay for a full-time gardener and finance the Club publications.

The 2007 edition, which we visited the second morning of the conference, featured a woodland garden put together by the seed collector Josef Jurášek. It contained the buoyancy of a circulating stream, beautifully disposed rocks, and such tiny gems as *Corydalis rusbyi* set back from the path, yet strikingly visible. I've never seen a woodland better integrated in a rock garden setting.

This was the venue for which in 1980 Josef Halda, assisted by Zdeněk Zvolánek, created a crevice garden that revolutionized Czech gardening. As a young man, Halda spent summers in the mountains and did a lot of athletic rock climbing. When he came to botany and a career as a taxonomist, he brought a mountaineer's perspective. University herbariums had their uses, but to differentiate plants you needed to experience them in their multiplicity in the wild. Plants grew, he believed, where they did for a reason, and, in making a garden, it behooved one to reproduce the same mountain conditions.

It may be argued that the crevice gardens Halda built, based on geologic principles of rock stratification, were not exactly novel. In a talk later the same afternoon, John Page showed that as early as 1831, Lady Broughton of Hoole House had a precariously built rockwork wall representing a mountain panorama in Savoy complete with a "Mer de glace" fashioned from limestone, quartz and spar to represent the eternal snows. She had done the Grand Tour and, having carefully observed the various ways in which plants were growing in the French Alps, she adapted her cultivation methods to suit her selection of the most beautiful and rare alpines. Each species was given its own pocket of suitable soil and there was a top-dressing of fragments of stone and clean-washed river gravel if evaporation was a problem, or moss if the object was to retain moisture. If she wished to keep the soil relatively warm, she used dark fragments of rock; and to keep the soil cool, she gave it a covering of white pebbles which reflected the light and heat. The same principles were not unknown in America. In *Rock Gardening*, Lincoln Foster provides examples of how to build a stratified rock design.

Halda's contribution lay in bringing the whole look of the mountain into the design foreground. Instead of setting off plants among receding boulders—smaller plants up front, larger ones behind—he brought the mountain forward so that the plunging strata of the rock formation, with its niched plants, confronted the viewer directly. Rounded boulders were replaced by parallel slabs. The slanting rows were laid in layers of closely wedged stone. Water was brought in from behind so that the roots would extend reaching for it. Crevices were then filled with the exact combination of minerals and earth a plant required. Given quick enough drainage, true alpines stood a better chance of surviving the summer muggs and winter wet. We often wonder why mountain geophytes choose such unlikely niches. How can there be soil on which to feed? As it turns out, the important thing for a seedling is drinking, its long delicate tendrils reaching through the clefts in the disintegrating limestone to garner moisture.

Rock gardens are notorious for requiring an inordinate amount of attention. Fine, if, like me, you enjoy finding excuses to spend each available minute in the garden. It helps, too, to have a pair of knees still capable of crawling about. But Halda and Zvolánek are plant explorers and wanted a "lazy man's garden" that

they could leave without their plants suffering disaster. A garden that contained more rocks than plants, like the one Zvolánek made for himself in a family-owned quarry, might look a trifle severe; but it stood a chance of being relatively weed-free. With a crevice garden, British growers may find that they can dispense with their beloved cloches and plates of glass.

A well-designed crevice garden possesses a beauty that suits its site and a coherence that translates us to a mountain realm even before a plant is inserted. Nor does a crevice garden have to consist of three-quarters-buried pieces of upright slab. On the bus tour's second day, Halda showed us a garden of enormous slabs of stratified ledge he designed for a nearby farmer, Zdeněk Čančara. Rocks were chosen for their irregularities, the wavering lines in their surfaces, then carefully wrapped in hay to withstand transportation. In Halda's design the massive elements flow together, horizontally and vertically, to create the illusion of a slowly descending mountain site (p. 337). I'd love to have a garden of exactly that kind placed outside my front door.

I participated in the first, second and fifth days of the bus tours and will describe three gardens that impressed me. The first was Jiří Novák's in a tiny back yard, hardly wider than his house, which ran on in the flat for 50 feet before ending at a fence overlooking a river (photos, pp. 335–6). Yet it housed part of the national saxifrage collection—Novák is the registrar of Kabschia cultivars—while containing tufa troughs with *Jankaea* in bloom, *Eritrichium nanum* grown from wild-collected seeds, outlandish *Phyteuma comosum* peeking from a north-facing crevice, self-sown *Myosotis pumila*, and a score of acid-loving *Androsace* species. Best of all was a tufa garden planted in a shallow cement pond, an enchanting alpine environment of peaks, pools, and meadows—a bit like the garden in a model railroad layout. There was a second alpine house, full of saxifrage seedlings and seven sets of surgical tweezers for purposes clearly other than removing ticks. I don't think I've ever beheld the work of a more consummate miniaturist.

At the other end of the spectrum from Novák is Jaromír Grulich's garden in Sedloňov, a few miles from the Polish frontier, a work of such scope as to deserve the term "monumental." That it is the creation of a single man who has taken care of it alone, over more than 50 years, staggers belief. The garden started from a rechanneled stream. On the islets thus formed Grulich made a series of raised beds, the niches dotted with high alpine gems, placed to be visible. When in the early 1990s a storm blew down the trees blanketing the adjoining cliffs, Grulich got permission to develop the newly revealed stone. The result is a towering garden of astonishing surprises: *Primula*, *Lewisia*, *Cassiope*, and a scattering of arctic beauties that appreciate the acid soil conditions, peeping from nooks and crannies as you ascend by one of a number of paths.

Grulich's achievement is all the more awesome in that the garden lies on a south-facing slope without any possibility of irrigation. At the time of our visit it hadn't rained in six weeks, and it was instructive to see this very old man trudging around with his water pails. All the same, he manages, he told us, to get away to the mountains every summer. It is this mountain reality the garden honors. It can't help but remind me of the cult of the sublime from which the earliest nine-

teenth-century gardens emerged. Among all the wonders of the rock gardening world, Grulich's might well top the list. And not a weed, not a dead leaf.

Yet the garden that most appealed was Vladimir Staněk's crevice garden in Sedláčany, which we saw on our last day. The garden is a rather private affair, tucked on a half-shaded slope behind the house, as if very careful not to rouse a neighbor's jealousy. It was full of old cattle watering troughs, each somehow decked out to look like its own distinctive Alp, but with plants you would never find together—every possible species of *Androsace*, for instance. But instead of being prominently displayed, a number of troughs were to be found in a corner near the bottom of the crevice garden. The garden itself looked like an extension of the troughs, full of the smallest plants, among them an *Androsace vandellii* bearing an impressive '97 tag. Staněk has participated in a number of expeditions to Turkey, and the garden displayed a fine collection of *Asperula*, *Campanula*, and *Convolvulus*. Completing the garden was a little woodland of *Primula* and, sheltered on the east, a gathering of meadow orchids. Walking back to the bus, we all noticed the “knock-on” effect: every yard had its own thriving rock garden. Could that be the future?

We all, I think, returned home inspired to tear up and redo at least one of our existing gardens.

In Vienna, on the way to Prague, my wife and I checked out Europe's oldest institutional alpinum, founded in 1803 on the Belvedere Palace grounds near the Südbahnhof railroad station. Never marrying, famous for the parties he tossed, the military hero Prinz Eugen of Savoy had put his considerable talents into the creation of the Belvedere gardens in the seventeenth century.

The alpinum is a sizable one, with larger plants than are usually tolerated in a rock garden (photos, p. 338–9). The plants are what we noticed: the yard-wide *Gypsophila aretioides* draped over a boulder, the different species of *Minuartia*, each shrouding the whole of a large boulder, the big shaded tree peonies, *Haberlea rhodopensis* in pale blue and cream blossoming next to the roots of a small shade tree. Even more prominent than the plants were the huge metal labels. The gardeners obviously delighted in confusing the eye, so you could not tell which was rock and which was plant. *Aethionema grandiflorum* lent itself to these games, rising in a succession of mounds to a small granite eminence.

For me, the garden seemed more a celebration of variety in bloom, of rocks and the illusion of rocks that large cushion plants create, than about visible gems in distinct mountain settings. But my wife appreciated the generosity of the ancient offerings, the water features, the voluble blackbirds, the gorgeous water-dropped peonies, the air of a rather more wild medieval garden. All the same, there were discoveries I made: *Doronicum* looking very cheerful in flower in a shaded site, *Hieracium* brilliantly confined among rocks, or a Siberian iris, “blue-kissed cascade,” blossoming in deep shade that set off its midnight blue.

Robin Magowan, a poet, essayist, and travel writer, creates and re-creates his rock gardens at his country house near Salisbury, Connecticut. The photographs illustrating this article are by his wife, Juliet Mattila, also a poet.

Alpines in a Garden Wall

Denis Hardy

Making a new garden at our home in northeastern Scotland a few years ago, we planned a paved area outside a 10-foot (3 m) wide French door on the west side of the house; about 12 feet (3.6 m) beyond the door the ground rose 2 feet (0.6 m) above the patio level. We thought a retaining wall with alpine plants incorporated would make an attractive feature (photos, p. 342-3).

A quick way to make a wall was to use concrete blocks, 18 by 9 inches, 4 inches thick (45 by 23 by 10 cm), widely used here in building work. A local company was selling such blocks made with a cast stone facing, the shade of which matched that of sandstone from the Hopeman quarry near Elgin in Morayshire, 50 miles east of here. This sandstone has been used locally for centuries in buildings. The block facings were patterned to give the effect of different-sized stones; some had a faced end for use in corners.

For the wall to front a rise of 2 feet (0.6m), I used two courses of blocks, with 2-inch (5-cm) thick capping pieces 21 inches (52 cm) long and 6 inches (15 cm) wide. I laid ordinary building-grade blocks flat in a shallow trench for a firm foundation, marked out with string and pegs to keep a straight line. Horizontals were checked with a spirit level. A simple mortar of 1 part cement, 2 parts sand, and 4 parts stone chips filled gaps. I then built up the faced blocks using a mortar of 1 part cement, $\frac{1}{2}$ part lime, and 4 parts sand, with plasticiser to make the mortar easier to handle. I left gaps for drainage at the bottom and placed other gaps at various levels for later insertion of plants; these were plugged temporarily with cardboard tubes to stop mortar slipping in. The top course of blocks was mainly laid offset so that the vertical joints were staggered, the usual practice for a wall. Angled joints were made using end-faced blocks.

The completed wall stood a few feet in front of the ground behind; I filled the space thus left with a mix of soil, peat, and $\frac{1}{8}$ -inch (6-mm) granite chippings in the ratio of about 2:3:11, with the addition of some slow-release fertilizer. No rubble was put at the bottom "for drainage" because the mix is porous anyway. I trampled down the soil mixture well after adding every 6 inches (15 cm) depth or so to minimize later settling due to time and weather. The final level was made up to about 3 inches (7.5 cm) above the top of the wall for the same reason. I

placed plants in the wall's gaps as filling went on, with the roots spread behind the wall wherever possible.

The wall section outside the French door is 15 feet (4.6 m) long; other sections vary from 3 to 8 feet long (1 to 2.4 m) as the wall wanders round the outside of the house. Some parts thus face roughly east, others mainly south. The total length is about 50 feet (15 m). Some bits of native limestone from the roadside near Ullapool on the west coast where it falls off the cliffs above have also been used in the wall and capping.

One of the most successful plantings has been *Ramonda nathaliae* (p. 342); I placed four divisions made from a single plant into an east-facing section, and for six years now three of them have made a fine display every May. (The fourth died of unknown causes in 2003.) Other plants that have grown well include *Waldsteinia ternata*, *Primula marginata*, and *Kalmiopsis leachiana*. Two encrusted saxifrages have flourished; one plant of *Saxifraga callosa* (bought as *S. lingulata* 'Superba') has made a 9 inch- (23 cm-) diameter dome, and the hybrid *S.* 'Francis Cade' is also at home in the wall. For the last two years some cursed creature as yet unseen has nipped halfway through several flowering stems of the large dome, spoiling the usually spectacular display. Measures against slugs and earwigs have failed; suggestions will be welcome.

Some lewisias have flowered well for several years and then died, perhaps of winter wet even though planted vertically. They include *Lewisia cotyledon* hybrids, *L. tweedyi*, and 'Little Plum' (p. 343). I introduced *L.* 'Little Plum' into cultivation after it appeared in my collection of the genus; Brian Mathew in 1990 concluded that it is most likely a hybrid of *L. longipetala* and *L. cotyledon*. Unusually, it is fertile, comes true from seed, and appears regularly in seed lists. In 2002 I saw it flourishing in the scree at Rhonda Williams's Recluse Gardens at Wasilla, Alaska! I recommend this attractive wee "Scottish" lewisia to all rock gardeners, there is more about it in my article in the bulletin of the Scottish Rock Garden Club (June 1999, p.227). A genuine Scottish native is *Salix reticulata*, a prostrate dwarf willow, happy in the moisture at the foot of the wall.

Over the years the wall face has attracted a mossy growth that, in moderation, gives it a lived-in look, but is now in need of some reduction in parts. I'm not sure how best to do this without damage to the facing.

I found the late Duncan Lowe's book *Growing Alpines in Raised Beds, Troughs and Tufa* (Batsford, 1991) very useful with its coverage from construction through soil mixtures to suggestions for suitable plants. Also covered are maintenance and replacement of plants that die. So far I have put off such major operations as soil replacement—the original mix gets compacted and nutrients leach out—and have only replaced a few failures with small seedlings or cuttings. The work of excavation behind the wall to renew soil and plants does not appeal!

Denis and Elizabeth Hardy rebuilt an old cottage on the hill above Muir of Ord, with views of the Beaully Firth to Inverness and distant oil rigs in the Cromarty. Their (fenced) garden includes alpines, shrubs, a native birch and pine wood and is surrounded by rabbits and roe deer keen to get in to join the moles and mice.

Using Non-traditional Rock Garden Materials

Jack Muzatko

When I first decided to build a rock garden, I was told the proper way was to use only the native rocks found where the garden was to be. I have never been very traditional or proper, and I laughed to myself as I gazed across the ugly mudstone that made up my hillside.

Of course, this is only one of many options available to a rock gardener. Another possibility would be to choose rocks and materials that duplicate a particular place on earth: The granites of the high Sierra Nevada, the lavas or sandstones of the Western deserts, the limestones of the Dolomites—the list is endless. However, my rock garden style combines beautiful and interesting rocks from all over the world, often in combinations that never occur in nature. I like to call it “psychedelic progressive”; I think my favorite rock garden might be one designed by Salvador Dali.

The bird bathing pool (photo, p. 340) is the centerpiece of my backyard rock garden. It is a solid milky quartz boulder approximately 3 by 2.5 by 2 feet in size. Evidently, I was the only one who could see the natural birdbath in this large boulder lying on its side in the back corner of a landscape materials lot. After moving it onto the concrete base I had built, I created an underground reservoir and pump system so that water would continually recirculate over a quartz crystal waterfall into the pond. I also designed a solenoid-operated gate valve to automatically empty the reservoir and flush the system with clean water every day (the birds seem to like this). The water is not wasted. It is channeled under the rock garden to the roots of my orange, lime, and lemon trees. Growing in the crevices between the crystals and the quartz can be seen several *Heuchera* and *Sedum* species. *Raoulia australis* partly covers a slab of granite.

I love to use quartz crystals in my rock garden. Some shown in the photo are as large as 4 inches (10 cm) thick and 7 inches (17.5 cm) long. In some places I have used citrine and amethyst crystals. Unfortunately, they tend to fade after a time in sunlight, but some of them retain enough color to stay interesting.

I developed a technique for connecting rocks together using cement (not concrete) and colorant made for cement. The cement itself can be obtained in white or black (actually dark gray). It is possible to create a palette of colors and tex-

tures using combinations of different colorants, cements, and sometimes some crushed material of the rock that you are trying to match. With a little practice, you can soon get remarkable results. I have created many larger sections of rock that look like one solid natural piece, and features in which crystals seem to be growing out of a natural rock seam. The photo on p. 341 shows the variety of rocks that can be included in such a design.

Mine is a small rock garden. Actually, it is a series of small rock gardens, each a little different, and mostly devoted to small or miniature alpines and succulents. This makes the rocks even more prominent and important. Sometimes I choose rocks from the places where the species grow wild, and sometimes I choose rocks that just seem to set off the beauty of a particular plant. Sometimes I just like the rock. In your own rock garden, you get to do whatever you like. I think my favorite rock is a metamorphic/granitic rock from a special place at the batholith contact zone in central Idaho. It contains quartz, gneiss, and other material, partly translucent, with beautiful red, white, black, and yellow segments. I have filled the back of my jeep with it many times. I have often thought that some photos that were selected in the photo contests may have been chosen because of these beautiful rocks in the pictures.

Of course, the most important consideration in making a rock garden is functionality. You must give the plants what they need to grow. My design provides raised beds with good drainage channels underneath the surface rock. I use lots of rebar and concrete in construction, and the rock is usually held in place quite firmly (an elephant could sit on it). Often I start with rocks on each side anchored to the bedrock, with a steep channel in between. A plastic barrier is then laid down on the native soil. On top of that I lay a couple of inches of scoria (volcanic pebbles) to facilitate drainage. An example of this is shown on p. 341. Next, I lay down a gopher screen (galvanized wire mesh, ½-inch squares), and then cement the horizontal rocks into place with rebar across the channel. The scoria and screen provide temporary support for the rocks so that a space of 2 or 3 inches remains for drainage between the rocks and the plastic barrier. The photo on p. 341 shows the project nearly completed (except at the bottom).

This initial construction can be done in a rough manner. The detailed coloring and matching of rock surfaces previously described can be completed later. Even the addition of quartz crystals or other fine details can best be handled later, with a little planning. Although these photos show a sprinkler head, I have since converted this and much of my other garden space to underground drip lines. Many alpine plants seem to like that better in this type of rock garden.

After all is finished, the soil can simply be placed in the pockets formed by the horizontal structures. This design allows soils of different composition to be easily placed (and replaced) at different locations. I love to experiment. I often test various synthetic soil mixtures, including native soil components for individual species. The soils are often not homogeneous from top to bottom. I sometimes try to replicate some special drainage or other condition that I have observed in a specific native habitat. Some plants will flourish in one place and

die only a few feet away owing to variations in shade, drainage, soil composition, and so on. The photo on p. 340 shows the finished garden.

My next project is going to be a small rock garden made of beautiful black, bubble-filled lava with smoky quartz crystals growing from cracks in the rocks. Outside my garden, of course, this would only exist in a surrealistic dream. It will look fine for my carnivorous plant collection. If I only had more time!

I don't expect anyone to build a rock garden just the way I do. Nor should they. A person's rock garden should be an expression of his or her individual creativity and imagination. The possibilities, variations, and themes are unlimited. Maybe not everyone will appreciate your work, but if you are happy and your plants are happy, nothing else matters.

Jack Muzatko, a retired engineer, gardens in Pinole on the northeastern part of San Francisco Bay, California. In addition to his innovative techniques, he has a special interest in the genus *Lewisia*, on which he has spoken to NARGS meetings.

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Winterizing a Northern Rock Garden

Shirley Friberg

With the first 45° weather, the sweaters came out, as did thoughts of putting the garden away for the winter. It rained and rained, and the raincoats came out. I used pots to cover some plants that like to be dry in the fall. Then it turned warm—78° (26° C)—and the shorts came out. Now I am back to the sweaters. We can get a frost at the end of September. On Halloween we can have 12 inches (30 cm) of snow, or sweater weather. There can be heavy snow cover all winter, or just an inch or two most of the winter. We usually have a December or January thaw followed by subzero (below -18° C) weather. That is why Minnesota is called the “Theatre of Seasons.” Oh, Minnesota, what trials you give our plants and us! It is remarkable that any plants survive. That is why we rock gardeners try many methods of protecting our plants.

The first job in mid to late October is to transplant and bring indoors those plants that are not winter-hardy. In my garden that includes *Delosperma*, *Oxalis*, *Erodium*, and a Zone 7 *Sarracenia*. The *Delosperma* do drop seed and have come back each summer, but there is always a chance they may not, so I save one plant of each species.

At this time of year, we look at our gardens critically for what needs to be cut back, transplanted, or just removed. Occasionally rock garden plants grow larger than you expect. Plants like *Veronica*, *Phlox*, *Aubrieta*, *Iberis*, and *Chrysanthemum* can outgrow their space and need to be cut back or transplanted. You may transplant because of height, color, or inability to grow well in a sunny or shady location. I have transplanted dwarf iris and primroses both in spring after blooming and in fall. Observe plants that could be thinned and, in spring, dug for your local plant sales. If you don't have a sale, give them to a friend and you may recruit a new gardener. If you did not cut back plants that seed furiously after flowering, do it now. Some seed will scatter as soon as it is dry. Some careful deadheading will prevent undesired plants. If you collect seed for the NARGS Seed Exchange all summer, you will have less to cut come October and November.

After we have at a few weeks of freezing weather, usually by the middle of December, it is time to cover plants. If heavy snow cover is forecast, we will immediately put cover on, because we can't predict whether the snow will persist

throughout the winter. Clay or plastic pots are put on plants that are borderline (Zones 5 and 6) or that do not like to be wet. I cut burlap into circles and, using heavy thread, made large stitches around the edges. This turned them into little umbrellas to be placed over dwarf conifers, especially those susceptible to winter burn. Dwarf *Chamaecyparis pisifera* and *C. obtusa* and *Thuja* can get some winter burn even with burlap cover, but can be trimmed later. Spruces, firs, junipers, and pines can winter burn, but not so severely. The dwarf *Thuja* 'Teddy', *Juniperus communis* 'Compressa', and variegated Sanders Hinoki cypresses are very prone to winter burn. *Abies koreana* 'Silberlocke', the dwarf Mugo pine 'Slow Mound', and *Juniperus* 'Mother Lode' have not burned even without cover. My pines stick up above the hay, but have never burned.

Troughs are taken from the deck and placed together on the ground. Two of my troughs are made of hypertufa, and the others of Styrofoam. One is a formed Styrofoam window box purchased in 1996, when I first saw a trough and could not wait to make one. The troughs have survived outside in summer and winter. They adequately protect the roots of both alpiners and conifers. I have had equally good results for survival in ground and in troughs

We have many "varmints" that visit and, to my dismay, live in our gardens. They include field mice, rabbits, chipmunks, and occasional voles, deer, and wild turkeys. I discovered the voles really do not eat rock garden plants, but love tulips and some other small bulbs. The mice enjoy making nests under plants that provide an umbrella of protection. Do not get too eager to cover plants early, or they will make perfect nests for the varmints. I thought I would eradicate all mice and rabbit nests by thoroughly cleaning our daylily and Siberian iris areas, where they had been nesting for several years. After an early hard freeze, I put down marsh hay covering my rock garden. The next spring, I discovered the mice had simply moved from their former location to the rock garden, which they had not damaged while living in the perennial beds. I vowed to wait much longer to cover the rock garden the next year.

We cut PVC pipe into 7- to 8-inch lengths and put a cube of mouse poison in the center. They are placed between the troughs. Screens cover the troughs because the squirrels like to plant nuts in them. They are then covered with marsh hay. Pipes with mouse poison are also placed under plants in the rock gardens. Dogs and cats will not bother them if they are well hidden, and the cubes are too heavy for mice to carry from place to place. (They will carry tiny pellets to their nests, which could be anywhere.)

Marsh hay is then placed on the rock gardens. It is light and fluffy and stays that way all winter. I put enough on to cover all the plants about 8 to 12 inches (20–30 cm) deep. When the winters have been extremely cold (-20° to -30° F/ -29° to -34° C) with little or no snow, I have covered the hay with green cloth that I purchased as a shade cover for the rock garden when temperatures get to 90° F (32° C) in the summer; it helps keep the plants from burning.

Members of our chapter have found a variety of ways to protect their rock garden plants. One has a back yard facing west with a very steep incline to a creek. Because of the steepness of the garden, she places temporary fencing on

each garden tier and spreads oak leaves between the strips of fencing. She has had very good luck with this method.

Another has a gently sloping rock garden. He places pots over each plant. This does protect them from cold, mice, and rabbits. This is a good method for younger gardens, but it could become more difficult as plants mature and grow closer and larger. It is also difficult to cover plants growing in crevices. Yet another member cuts conifer branches and places them over her rock garden.

Whatever the method, all are trying to afford some winter cover for their small plants. Yes, I know the plants do not have all of this “mothering” in the mountains—but there, they have different climates.

Shirley Friberg gardens in St. Paul, Minnesota. An earlier version of this article appeared in her chapter’s newsletter, “Minnesota Rock Plant Notes.”

Corrections

The author note that appeared on p. 274 of the Summer 2007 issue was composed by the editor on the basis of faulty information and contains an error. The author, Art Guppy, is not a “noted grower of rhododendrons and ericaceous plants”; he is a specialist in the genus *Erythronium*, which he has studied in the wild and in the garden for many years. Our apologies to Mr. Guppy for this error.

The photograph of *Omphalogramma forrestii* on p. 260 of the Summer 2007 issue was taken by Harry Jans. In the caption it is erroneously credited to David Rankin, author of the accompanying article. In addition, in the author note to the article on p. 296, Mrs. Stella Rankin’s name is erroneously given as “Sheila.” Our apologies to Mr. Jans and the Rankins for these errors.

More Techniques for the Seed Sower

NOTE: The previous issue (summer 2007) focused on raising plants from seed. A call for contributions inspired so many excellent contributions that we didn't have room for them all. Here are three short articles to add to your knowledge of this important aspect of rock gardening.

Growing Azaleas and Rhododendrons from Seed

DICK CAVENDER

I am sure that most gardeners have grown plants from seed, but have you ever considered raising azaleas and rhododendrons (*Rhododendron* species and hybrids) that way? It's really very easy, and the results can be very interesting and rewarding. There is nothing like having your babies flower for the first time and knowing that *you* are the only person in the world who has this plant.

Why grow azaleas and rhodies from seed? There are several reasons.

First, you may want more of a plant you already have. If the parent is a hybrid, though, sowing its seeds will *not* work. The only way to increase it is by cuttings or grafting. Most gardeners grow some hybrid rhodies and azaleas, and these will have from two to ten or more ancestors in their pedigrees. Regardless of whether you or a bee causes the seeds to form, you will get a great variety of plants from one capsule—no two the same, and none that look like the parent that set the seed. If your parent plant is a true species, as found in the wild, your chances are better of getting something similar; however, you must hand-pollinate the flower with pollen from another flower of the same species; I'll explain this later. If a bee does it (open pollination), there is no telling where she picked up the pollen, and rhodies are very promiscuous.

Second, you may want to "invent" a new rhodie. Most of our garden cultivars were produced when someone decided to combine two nice plants and see

what resulted. This is also done by hand pollination. There are many people all over the world making crosses to develop new plants. It's been going on since rhodies were first introduced into gardens a couple of centuries ago. There are as many reasons for crossing plants as there are people doing it—improved flower color, better foliage, and cold or heat tolerance, to name a few. However, you must be prepared to grow a fair number of plants for up to ten years and be ruthless in selecting only the best. Lionel de Rothschild is said to have burned around 10,000 plants a year when he was developing the Exbury azaleas. Warning: this can become addictive.

Third, you may want to grow plants found in the wild. There are 500 or more species of *Rhododendron*. The majority come from Asia—China, Nepal, Tibet, or northern India. Oregon, my home state, has five native species. It is difficult to collect growing plants in the wild, and in many areas it's also illegal. Moreover, you can't import plants with soil on the roots, and completely removing the soil from the fine roots of a rhododendron can easily kill it. Cuttings are a bit easier, but the timing may be wrong when you find the plants, and there are import restrictions on this type of material as well. Seed, therefore, is the simplest method.

Rhododendron seed can be collected from late fall to early spring. Last year's seed can often be found on flowering plants in spring. In the wild there is often no other *Rhododendron* species nearby to cross-pollinate, so the seed is that of a "pure" species. You will get some variation, but that is part of the fun. Many of the species rhododendrons in cultivation were grown from only one or two collections. Now that China has opened up, new collections are being made and new species identified.

Deciduous azaleas, many of them native to eastern North America, are probably the easiest types to grow from seed. As rhodie seed goes, it's fairly large and easy to work with. Another nice thing about deciduous azaleas is that it's hard to grow a really bad one, even from open-pollinated seed. Before the advent of tissue culture, many deciduous azaleas were grown from seed because their cuttings are tricky.

Hand pollination

If you want to invent a new rhodie or set seed on a species plant in your garden, you must control the pollination of the seed parent's flowers. No bees allowed! Select a flower that is just about to open so that you are certain the bees have not visited first. Use forceps to remove the flower petals to the base, as well as the filaments and anthers. The pistil should be sticky, but if not, give it a few days. Apply the pollen from another flower on the same plant to "self" it, or from a different plant to make a "cross." If you are using two different clones of the same species, it's an *intraspecific* cross. Crossing two different species is an *interspecific* cross. I usually pollinate at least two flowers and always remove all other flowers in that truss. The bees will not be attracted to your cross after the petals are

removed. However, some people like to place a foil cap over the stigma or a mesh bag over the entire truss. Do not use plastic, as that will make your work rot.

Be sure to label the flowers you have pollinated. Note both parents, seed parent first, and the date. I also make a list of the crosses and location. You should be able to tell if your cross “took” within three to four weeks. Come late August, I walk through the garden about once a week and look at things to see how they are doing. I try to wait until the capsules start to turn brown before harvesting them.

Storing seed

At harvest, I pick the capsules and clean excess junk off, and place the capsules in an *open* 35mm film canister *with a label*. If it's a cross, be sure to note both parents, seed parent first. The film canisters are placed in a warm, room temperature area like the top of my computer desk or the top of the water heater or refrigerator. Be sure to leave the lid off the canister, or the seed will rot. I do not collect seed in plastic bags—again, to avoid rot. Small paper bags work, but film canisters are best. The capsules will open in the canister, and most of the seed can be shaken out with minimum effort and without breaking the capsule up. The sections of the capsule can be pulled apart and cleaned out with a toothpick. I like to do this over a sheet of white paper, which allows me to sort out the chaff as I go. I just store the open canisters on a shelf until I am ready to plant. I have had good germination of *Rhododendron occidentale* seed stored in this manner for three years. It's been my experience that rhododendron seed needs no special treatment such as stratification to break dormancy. I have collected *R. occidentale* seed on February 20 and transplanted 2-inch plants from that seed on June 16 of the same year.

Sowing seed

Over the years, I have sown seed at various dates, from as soon as the capsule opens to April of the next year. I have decided that February–March is about the best time period for me. Since I have a greenhouse with a heated propagation bed and mist system, I grow the seed there. I use 4-inch pots filled three-quarters full with any good soil-free mix, well soaked. I add a small amount of fertilizer, such as a local product of proportions 10-6-4, to this soil mix.

Cover this mix with about $\frac{1}{2}$ inch (1.2 cm) of fine milled sphagnum peat. Since I'm cheap, I use a mesh-bottomed flat to screen the peat. NoDampOff dried sphagnum moss (not a peat product) is available in small bags, but two bags cost about as much as a 4 cubic foot bag of regular peat. Mix the sieved peat with water in a bucket to get it soaked. Sow the seed *thinly* and place the open pot on the mist bench.

If you don't have a heated mist bench, you can put your pots inside a clear plastic bag (such as a dry-cleaner's bag) or a plastic deli container. Place the closed container in an east or north window in a warm room, or under cool white

fluorescent lights. Closed containers or pots in a bag will not need to be watered much, as condensation will keep things damp; however, check occasionally and mist gently if needed. *Never let the surface dry out.*

Growing the seedlings

Seeds of deciduous azaleas planted in February are often ready to transplant in June, at about 2 inches (5 cm) tall. I don't recommend letting seedlings get quite that big before transplanting, but they can get away from you. Seedlings of other kinds of rhododendrons develop more slowly. Since I am forcing fuchsias during this period, I fertilize every time I water. I run a soluble fertilizer (Peters 16-16-16) through a siphon mixer, and the seed pots get a sprinkle every two or three days as soon as I see green. If you are using closed plastic containers, you can use a spray bottle with soluble fertilizer mixed at half the recommended strength. Seedlings can be transplanted as soon as they have two true leaves and are about $\frac{3}{4}$ inch (2 cm) tall, but they are easier to handle at about 1.5 inches (about 4 cm). If you are growing them in a bag or closed container, about a week or so before transplanting, prop the container open slightly to harden the plants off a bit. *Watch that they do not dry out!*

I like to transplant into 2-inch (5 cm) pots as it saves room. My flats hold 49 pots, and one or two flats is usually sufficient unless the cross is something special. The loose soil mix makes separating the seedlings fairly easy, and I return them in their new pots to the mist bench for a month or so to get established. If you are not using a mist bench, the seedlings will need some protection to get going. A mini greenhouse can be made with an old aquarium, a large plastic cake container, or even a dry-cleaner's bag. If using a bag, support it with wire hoops so it does not lie on the plants. If using a mini greenhouse, after a week or two open it gradually and finally remove it. Again, I fertilize every time I water. The seedlings can be potted on as necessary. I have produced flowering azaleas in three years and have heard of others doing so in two years. Other kinds of rhododendrons may take as long as five years, and one batch took 17 years!

Sources

As mentioned, this can be addictive. A good source of seed is the American Rhododendron Society Seed Exchange. The early distributions are to members only, but it's open to the general public after May 1. They list many wild-collected seeds. The link is at <http://www.rhododendron.org/> The Royal Horticultural Society Rhododendron Group also offers seed, but only to members. A few of the big seed catalogs offer seed, but I don't recommend those as they are mostly open-pollinated, and you could get anything. Have fun!

Dick "Red" Cavender is the longtime proprietor of Red's Rhodies in Sherwood, Oregon. In addition to rhododendrons, he grows many pleiones and other terrestrial orchids.

Germinating Iris Seeds

NORMAN DENO

Iris species of the Scorpiris (Juno), Oncocyclus, and Regelia sections, collectively known by gardeners as “aril irises,” as well as some other species such as *I. aphylla*, *I. italica*, and *I. zenaidae*, have seeds that are notoriously difficult to germinate. A procedure has now been found whereby fully developed seedlings of *Iris magnifica* have been grown in just 5 months from the time the flowers were pollinated. Anyone growing these *Iris* species is strongly urged to try this “cold green” procedure. If it proves to be widely applicable, it will greatly increase the availability of these beautiful plants.

The procedure is as follows. Flowers of *Iris magnifica* were hand-pollinated using a small paintbrush. On June 12, 2006, I collected four seed capsules just as the outermost cover of the capsule started to turn from green to brown. I immediately separated the seeds and placed them in moist “high wet strength” paper towels and put them in the refrigerator at a temperature of 40° F (4.5° C). I enclosed the pads with the seeds in loosely folded polyethylene bags, as described in my books on seed germination (see References). The pads containing the seeds were stacked on their sides so that the developing roots would travel downward along the inner surface of the towel.

On September 16, I examined the pads and, astoundingly, 60 of the 120 seeds had germinated. I kept the seedlings at 40° F for another week. By that time they had developed roots 1 inch (2.5 cm) long, and the start of leaves. I then shifted them to 70° F (21° C) and transplanted them into pots of soil that had been surface-sterilized by pouring boiling water over it three times and then allowing the soil to cool for several hours before planting.

I placed the pots under fluorescent lights indoors. Within 7 to 14 days after the shift to 70° F, the single leaves had developed to their full length of 5 inches (12.5 cm). As I write two months later, the seedlings are still healthy. They will be grown on indoors under the lights until next spring, then dried off over the summer and planted outdoors in the fall.

Germination continued at 40° F over the next six weeks. By then, 26 more seeds had germinated, for a total of 80% germination. These later-germinating seedlings developed somewhat more slowly, suggesting that the seeds had ripened beyond the optimal time. The seeds that did not germinate remained firm and were likely too far advanced in the ripening process when harvested and sown.

I kept another 20 seeds at 70° F as a control. The surprising result was that these seeds failed to produce a single germination by December 1. I have used green seeds before with success, but always with seeds that develop impervious seed coats, and germination was always at 70° F.

The literature on germinating aril iris seeds, particularly the “slicing” technique, has been reviewed in an extensive article by Elm Jensen (see references). This topic is also the subject of chapter 6 in the First Supplement of my *Seed Germination Theory and Practice*. There I proposed that these iris seeds have an impervious inner

membrane surrounding the embryo. This would explain the success of the slicing technique. It would also explain why these seeds germinate better in outdoor treatment, where the temperature oscillations expand and contract the membrane, leading to ultimate rupture, much as outer seed coats are ruptured. It would help to explain the erratic nature of germination, and why germination is so extended. A few seeds may germinate immediately because the impervious inner membrane was not perfectly formed. Finally, such a membrane could have survival value. By extending germination over several years, a population could survive being periodically wiped out by fungi. Such periodic wipe-outs are evident in many native American species, which survive only by abundant self-sowing.

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Dr. Norman Deno, a retired professor of chemistry, is well known in NARGS for his large, diverse Pennsylvania garden and his research on the germination of hundreds of genera of interest to rock gardeners, published in the manuals listed above.

Getting the Bugs Out

JOE J. SHAW

If I have large amounts of wild-collected seed, I treat them with cyfluthrin. Cyfluthrin is one of the semi-synthetic pyrethrum derivatives (or maybe entirely synthetic). It is essentially nontoxic for mammals, but as with any pesticide (or even any household cleaner), I like to understand what I'm using. I've provided a link below for the toxicity information. I just mist the seeds with a sprayer. Then I make sure the seeds dry well before storage.

I briefly rinse cleaned larger seeds, such as those of *Opuntia*, in cyfluthrin at about the concentration I'd use for lawns or house plants, or even 50% of that rate. I just make sure the seeds are wet and coated, and then I dry them on newspapers. The seeds must be dry before they are stored for any long period. When they are thoroughly dry, I put them in paper envelopes and store them. If I'm sending seeds to someone and am concerned about insects, I warn the recipient that the seeds are treated with cyfluthrin.

Other than cyfluthrin, I often use mothballs to prepare seeds for storage. When the seeds are ready to go into long-term storage (cleaned and dried, and even in their envelopes), I put them in a paper grocery bag or a plastic box with

a loose-fitting lid, along with two or three mothballs, then I leave them at room temperature for a week or more.

Cyfluthrin works for most things, but once I found a grub crawling out of a cyfluthrin-treated palm seed. The insect egg had been buried deep inside the seed, and the grub emerged months later as other seeds were germinating. I'm not sure if the mothball treatment would have worked either; sometimes insects in large seeds are beyond reach. The eggs were laid in the flower and $\frac{1}{4}$ to $\frac{1}{2}$ inch of impregnable tissue came to surround the insect egg. When you put the seed in a warm, moist environment, the insect begins to develop.

Another insect control I count on is the actual way I store seeds for the long term. They are as dry as they can get after four weeks or so in a climate-controlled room (air conditioning and/or heating). I dry seeds on tabletops or countertops indoors. Outdoors is a problem because of atmospheric humidity in my area. After they are quite dry, I put them in paper envelopes and store them over Drierite, which pulls more moisture from the seeds. I try to store seeds in the vegetable crisper or the refrigerator, or even in the freezer if there is room. The combo of cyfluthrin coating, dry air, and cold temperature controls all insects for me. The mothball treatment is just as good as cyfluthrin for live insects, but I don't know if mothballs work on insect eggs. The mothballs are easier to use because the seeds are all labeled and in paper envelopes, and there is no messing with solutions.

I use paper envelopes so that seeds continue to dry over the Drierite, and so that the seeds are not trapped in a plastic envelope with moisture. I know plastic is often used, but I eschew it. Seeds that can be dried (about 70% of plant species) should be as dry as you can get under home conditions before putting them into long-term storage. They can last many years if properly cleaned and kept dry. I also keep them cold because (on average) seeds last twice as long for every 5° C you can drop the temperature. Thus, if they have a 5-year life in your desk drawer at room temperature (75° F, 24° C), they will last 10 years at 65° F (about 19° C). And they will last 20 years if you drop another 5 degrees C (57° F, 14° C). So by the time you get to about 5° C (vegetable crisper range) they should last 40 years—according to the “orthodox seed” equation.

Orthodox seeds are those that can be dried and stored. Recalcitrant seeds have short shelf lives (days or a year), and cannot be dried. Actually, seeds do vary greatly, so I'll direct you to the wonderful Seed Storage Site and Seed Information Database maintained by Kew Gardens:

<http://www.kew.org/sid/viability/index.html>

<http://www.kew.org/data/sid/>

Please remember that all pesticides need to be stored away from pets and small children, and that washing up after use is a good idea, even for something mild like cyfluthrin. Here are links with toxicity information:

<http://extoxnet.orst.edu/pips/cyfluthr.htm>

<http://www.cdpr.ca.gov/docs/canot/ca98-3.htm>

Joe J. Shaw of Texas has a Ph.D. in Plant Pathology and a B.S. in Botany. Among his gardening enthusiasms are small *Opuntia* cacti, which make good rock garden plants.

BOOKS

Buried Treasures: Finding and Growing the World's Choicest Bulbs, by Jānis Rukšāns. Portland: Timber Press, 2007. 384 pp., 304 color photos. ISBN 978-0-88192-818-1. Hb, \$39.95; available at discount from NARGS Book Service.

Reviewed by JANE MCGARY

Within the large literature devoted to bulbous plants, *Buried Treasures* is unique for its time. By couching his discussion in narratives, the great Latvian grower Jānis Rukšāns harks back to early writers in the genre such as E. A. Bowles. This is not just another alphabetical plant dictionary, but rather an individual's account of his lifelong passion: what he found, where he found them, and how he grows them.

The volume has two major parts. Part 1, "Bulbs in the Garden" (pp. 19-82), describes the author's practices in his nursery operation and personal gardens, predictably covering propagation, greenhouse management, fertilizing and irrigation, pests and diseases, hybridizing, harvesting, planting, and record keeping. There is much here to interest and enlighten growers with small commercial nurseries or large collections. This section will be less useful to those wishing to incorporate bulbs in the open garden, since the Latvian climate is apparently quite different from almost anything experienced in North America; a correspondent suggests that its closest analogue may be the Atlantic coast of Canada. Unfortunately, the text contains only scattered hints about the environment where Rukšāns has developed his techniques; a conscientious editor would have requested clarification here. Many of the remarks seem to be specific to areas with short, very cool summers.

Part 2, "Bulbs in the Wild" (pp. 85-361), takes the reader to the regions Rukšāns has visited over nearly four decades of plant hunting. It is prefaced, happily, with a chapter on "The Ethics of Plant Hunting," expressing principles of which most of us will thoroughly approve. Then come the narratives: Latvia itself, Eastern Carpathians, the Crimea, the North Caucasus, Iran, Central Asia, Siberia and Kamchatka, and Turkey. These are "travelogues," but very fine ones:

Rukšāns is a professional journalist as well as a trained horticulturist, and his depictions of the terrain and the plants are vivid despite the sometimes obvious difficulties of composing in what I suspect is at least his fourth language. Here we find guidance for growing bulbs in the descriptions of their habitats, and information about the source of the plants Rukšāns now sells, as well as notes on his experiences after he brought them into cultivation.

Information on specific plants is thus scattered throughout the book, but there is a good index. The photographs (mostly taken in nature, and mostly good, though the blues are sometimes “off”) are “ganged,” as is Timber Press’s habit with books they don’t expect to sell to the general gardening crowd. The true enthusiasts will spend time this winter poring over this book beside a notebook or computer, compiling their own growing guides. This book won’t gather dust on the shelf; it contains its own hoard of treasures, somewhat buried in the format but as delightful to unearth as a well-offset *Fritillaria*.

This could, however, have been a much better book to read. As a bulb-growing editor who works often with non-native writers of English, I found many small points in the text that should have been queried, clarified, or simply corrected. There are taxonomic names that are not uncontroversial (e.g., *Cyclamen kuznetzovii*, *Ficaria kochii*) but that appear without synonyms. English usage frequently reflects the use of a bilingual dictionary rather than the knowledge of a native speaker familiar with specialized terminology (e.g., “striped” for virus symptoms, when “streaked” is the usual term; “fanciful” for “demanding”). There are solecisms that one can hardly believe got by Timber’s copyeditor, such as the garden-stomping “elks” of Latvia—which are not, of course, what North Americans call “elk”; “taxa” as a singular noun; reference to bulbs “germinating” rather than “making growth.”

In summary, I strongly recommend this book to anyone with a serious interest in geophytes (bulbs, corms, tubers, etc.) of Europe and Asia, and especially to enthusiasts of such genera as *Crocus*, *Iris*, and *Corydalis*, to mention three that are covered here in great depth. It should also inspire every reader to greater heights of plant hunting, photography, and appreciation of the natural world.

The Genus Roscoea, by Jill Cowley, with contributions from Richard Wilford and Roland Bream; ed. by J. M. Lock. (A Botanical Magazine Monograph.) Kew: Royal Botanical Gardens. ISBN 978-1-84246-134-1. Hb, 190 pp., maps, line drawings, and color photos and paintings throughout. Available from www.kewbooks.com. £33 + p&p (\$66 or 50 euros)

Reviewed by GARY DUNLOP, Newtownards, Northern Ireland

Roscoea is a small genus of hardy plants in the ginger family which have attractive and distinctive flowers and are well suited to growing in the rock garden. Whereas many alpiners are spring-flowering, the range of *Roscoea* species can provide color and interest throughout the summer. They vary in size from very small to quite siz-

able plants for rock gardens and can be grown in pots by those who prefer this form of cultivation. Given suitable conditions, with adequate moisture in summer and the tubers protected from freezing in winter, roscoeas are very easy to grow.

I grew my first roscoea over 20 years ago and became fascinated with the genus, though few species were readily available at the time. I have gradually built up a sizable collection containing most species, including various forms and flower colors of a number of species, which are quite variable. I don't have a suitable rock garden, so I grow them in raised beds. I now have them in what amounts to full sun, in a rather cool and cloudy maritime climate. I previously grew them in shade, but some of the late-flowering species were so late to appear and perform that I found full sun more suitable.

Despite there being relatively few species, and even fewer available to gardeners until quite recently, the identities of many species have been much confused in cultivation, which was not helped by photographs of wrongly identified species in many books. This was hardly surprising, because there was little accessible published information on the genus; in addition, some roscoeas can be quite problematic to identify with confidence. They vary considerably in appearance between the stage when they first appear and flower, and the mature stage after the foliage has fully developed. Juvenile plants at first flowering can also appear very different from more mature plants a few years older. This led to many mistakes in the early identification and naming of species.

There were two reviews in the mid-1930s which acknowledged the difficulty of identifying species from herbarium specimens, and then a gap of more than 40 years before Jill Cowley reviewed the genus, which was no easy task. Her review was published in 1982 in the *Kew Bulletin*. Unfortunately, this journal is not widely read in horticultural circles, and thus the review did not achieve an improvement in the correct identification of species in cultivation for many years. Now at last, 25 years on, and with several new species named and described in the interim, Cowley has had her monograph published, albeit some years after the manuscript was completed.

The monograph is packed with much interesting material and information, as well as being copiously illustrated with maps, line drawings, botanical illustrations of the species, and many photographs. After an all too brief history of the genus and a short chapter on the remarkable life of William Roscoe, the characteristic form of plants in the genus is described and illustrated in detail. A short chapter (4 pages) is devoted to the more esoteric botanical aspects of the genus. The next short chapter, "Ecology and Conservation," is of general interest to anyone who grows alpine plants from the Himalayas or China. A key to the species is next followed by the chapter that comprises most of the book and covers each species individually, in detail. The taxonomic sections are introduced, with a lot of background information about each species, covering its discovery and various introductions. Of course, there are also detailed descriptions of all species, accompanied by botanical illustrations, detailed line drawings, a small map indicating distribution, and many photographs of the species both in cultivation and in natural habitat.

The well-known hybrid *R. ×beesiana* is also included at the end, leading on to a list of cultivars and hybrids grown by the National Collection Holder. The final chapter, by Richard Wilford of Kew, covers the basics of cultivation.

Few monographs include so much fascinating information about the plants and those involved with their history, or do so in such a readable form. Few are so well illustrated, though unfortunately the color of a few photographs is not as accurate as one might like, but some colors can be highly problematic to capture accurately, as any amateur photographer of plants will know. There seems to be a little inconsistency in the botanical designation of color variants of some species. Although there are individual maps showing the known habitats of the various species, the composite maps in the early chapters that show the full geographic range of all species and, separately, the Himalayan and Chinese species, do not identify the individual species. It is thus not possible to tell from them which species grow in proximity to one another or have overlapping ranges. Despite the small scale of the maps, this could easily have been achieved with the use of several different shapes and colors of dots.

Anyone who is fascinated by this attractive genus will need no prompting to buy this book, but it also contains much to interest the less specialized reader. Some may consider it relatively expensive, but such worthwhile books do have a limited market and hence print run. It should prove a worthwhile investment, as the genus is bound to become much more popular now that there is more information readily available about the species and color variants.

Gardening with Woodland Plants by Karan Junker. Portland, Ore.: Timber Press, 2007. ISBN-13. 978-0-88192-821-1. 384 pp., 352 color photos. Hb US \$39.95. NARGS Book Service discount available.

Reviewed by BOBBY J. WARD, Raleigh, North Carolina

I grew up on a farm in eastern North Carolina, on land with ample woodlands to roam. I could recognize easily the sassafras, dogwood, cherry, and sycamore, as well as magnolia and sweet bay, but the exact name of a confusion of oaks and pines eluded me. More fascinating were the scores of plants, typical of the region's coastal plain, that grew beneath these trees, including lupine, violet, fern, jack-in-the-pulpit, iris, lady's slipper orchid, milkweed, and shrubby lamb-kill. I had not yet learned the word "perennial," nor did I know about such things as tree canopy, pH, garden mulch, or voles.

I recently thought about my childhood rambles and the magical place that a woodland can be when I read Karan Junker's "Gardening with Woodland Plants," in which she writes that there is no better place to watch the passage of the seasons than sitting quietly in a woodland garden. I agree.

Her definition, however, of a woodland garden is catholic: a few trees planted at the edge of a lawn, an orchard, "a classic English woodland . . . carpeted in snowdrops, primroses, and bluebells," the high canopy of evergreen conifers,

and, perhaps more British than North American, the shady side of a hedgerow. Junker, who lives in Somerset, England, gives equal hand to native and non-native plants as woodland recommendations, a fact that may upset native-plant purists. Her vision of woodlands is a compromise: a collection of shade-loving plants from all parts of the globe. Rock gardeners will appreciate her suggestion of woodland raised beds and woodland rock gardens for close inspection of the smallest trilliums, hepaticas, and erythroniums.

Woodland Plants is a comprehensive directory from *Acer* (maple) to *Woodsia* (fern), some 2,000 descriptions in total. Hellebores, hostas, heucheras, epimediums, and phloxes are well treated. There is good coverage of the low- and mid-canopy trees such as Japanese maple, serviceberry (*Amelanchier*), and dogwood, up to the much taller sweetgum (*Liquidambar*) and sugar maple. Included are a few shrubs such as *Hydrangea*, *Fothergilla*, *Viburnum*, and the relatively recent hybrid \times *Sinocalycanthus raulstonii*. Pteridophytophiles will have a heyday with species of *Asplenium*, *Dryopteris*, and *Polystichum*.

It was a genuine pleasure to discover that Junker knows *Spigelia marilandica*, the Indian pink of southeastern United States, which almost no one I know grows. With a corolla tube that is fire-engine red and yellow, it is a gem of a bloomer in my spring garden, beneath a tall canopy of white oak and loblolly pine. However, it has a far wider geographic range than "a few locations outside Missouri." Hillier Nurseries (UK) introduced a selection called 'Wisley Jester' in 2004.

There are a few quibbles. *Woodland Plants* is promoted as offering "detailed cultural tips" based on 20 years of the author's woodland gardening experience. But two (honest) tips on pages 152 and 153 (*Cystopteris* to *Daphne*) and 324 and 325 (*Sycoparrotia* to *Symphytum*), as well as other pages, offer little such information. Indeed, cultural information is rare except in the very general introductory chapter. If given at all, the dimensions of a plant (whether referring to height or spread is not always clear) are provided only in metric units, which might annoy U.S. readers.

Though Junker recommends ivy (*Hedera helix*) with trepidation, overlooked are its more benign shadeland relatives, *Fatsia* and \times *Fatshedera*. Also missing are *Kalmia*, *Rohdea japonica*, *Pollia japonica*, *Eomecon chionantha*, and the summer-blooming *Lycoris* species that are available in North Carolina's local nurseries. All tolerate light to medium shade, and I have grown them successfully for years.

The encyclopedia-like directory that comprises the bulk of the book lists a wealth of woodland floor plants and canopy plants that, in combination, create the backbone of a woodland garden. For the neophyte gardener, there is a good list of places to see woodland gardens in North America and the United Kingdom, and, importantly, nurseries to buy plants. Missing, however, are the outstanding gardens and arboreta in British Columbia. The book is illustrated with about 350 photographs, my favorite of which is a frost-covered *Daphne laureola* subsp. *philippi*.

I garden beneath high shade on Piedmont clay and on sand deposited by an ancient meandering creek, far removed in time and distance but not memory from the woodland of my early childhood hikes. A woodland is the ultimate secret garden. Junker's book helped me conjure up these memories.

Peony rockii and Gansu Mudan, by Will McLewin and Dezhong Chen.

Wellesley, MA: Wellesley-Cambridge Press, 2006. ISBN 0-9614088-3-9.

Available from www.wellesleycambridge.com.

Reviewed by JIM MCKENNEY, Rockville, Maryland

This book is bound to elicit strong reactions among tree peony enthusiasts. If you don't read anything else, read chapter 5, a joint effort of Will McLewin and Chris Sanders; this chapter is a *reductio ad absurdum* of the concept "Paeonia rockii" as used among Western gardeners. In a skillfully developed agenda of cogent and clearly articulated arguments, intriguing documentation, historical revisionism, fascinating speculation, serendipitous insight, and relentless intellectual curiosity, the history of Rock's tree peony is explored, dissected, and presented in a new light. All of this happens with the page-turning impetus of a good detective story. When the dust settles, several crooked halos are seen tentatively hovering over what are unmistakably feet of clay. And the reader understands why the "Peony rockii" of the title page is not the *Paeonia rockii* of some contemporary botanists.

Would that it were all so good. In his Introduction I (yes, there is an Introduction II) the author announces, "We have no concerns about including sentences and extended passages that need to be read twice or several times for their meaning and purpose to be clear." One thus gears up to deal with daunting intellectual complexity, only to endure a text littered with "infelicities" (the author's word): misspelled words, dubious agreement between subject and verb, inappropriate hyphenation, inconsistent capitalization, erratic italicization, odd abbreviations, bizarre arrangements of quotes and parentheses and brackets, even temperature ranges that lack the plus and minus signs needed to give them sense. Punctuation is frequently missing; there is at least one sentence which defies parsing as a result. Even something so basic as the formal botanical name of the peony family, *Paeoniaceae*—which appears at least three times—is misspelled at least twice. Let's hope this first edition is successful enough to allow a properly edited second.

Two cultivars of historic import, 'Highdown' and 'Joseph Rock', receive their formal descriptions here. The capital "G" Group, *Paeonia* Gansu Group, is defined. What are Gansu Mudan? "Mudan" is the currently favored form of the word we have long known as "moutan," and it is used in this work as the generic word for tree peonies. "Gansu" is the old "kansu." Mudan presumably are grown in Beijing, as moutan were once grown in Peking.

Gansu Mudan are a loosely defined horticultural aggregate which evidently arose in Gansu province as the result of hybridization between garden tree peonies and the local wild tree peonies, in particular the recently described "*Paeonia rockii*." The salient feature of Gansu Mudan is the black blotch at the base of the inside of the petal. However, as McLewin defines Gansu Mudan in this work, the concept includes tree peonies whose flowers do not have the black blotch. Furthermore, McLewin acknowledges that the black blotch also occurs in some mudan that are not Gansu Mudan. A chart gives the main characteristics of wild *Paeonia rockii*, Gansu Mudan and "central plains tree peony hybrids" (the *Paeonia suffruticosa* of Western tradition).

Are these recently described tree peony species good species? McLewin provides cautionary insight: isolated feral populations originally planted as a source of *danpi* (medicinal root bark) might have given rise to populations that seem to exist in a species-like relationship. McLewin notes that there is dissension among Chinese botanists about some of these purported species.

Those who follow his exhortation to use the *pinyin* (romanized Chinese) names of the cultivars—and who use the brief pronunciation guide he provides—should know that without the tone marking diacritics eschewed by McLewin, the resulting pronunciations will not resemble actual Chinese speech.

Nine color words are used to describe the colors of Gansu Mudan. Of these, five—yellow, green, black, blue and purple—are fictions. The yellow and green are developmental phases of otherwise white flowers; black would better be called garnet or maroon; blue and purple are variations on the magenta theme. I came away from this book convinced that I would not know a Gansu Mudan flower if I saw one. That remark is not as flippant as it seems: it simply acknowledges that the concept of Gansu Mudan presented here is not based exclusively or even primarily on floral characteristics.

Books Briefly

Reviewed by THE EDITOR

Designing with Succulents, by Debra Lee Baldwin. Portland: Timber Press, 2007. ISBN 978-0-88192-816-7. 255 pp., color photos throughout. Hardback, \$29.95.

The author lives in Escondido in southern California, so it's not surprising that this book relies on a plant palette not available to most NARGS members. Nonetheless, here is the mysterious flora we admire and try to identify when vacationing in Los Angeles, Santa Barbara, or San Diego. There is a sensible chapter titled "Growing succulents in colder climates," however, with photos of attractive plantings in both the U.S. Northeast and Pacific Northwest. There are also suggestions, and many evocative photos, for combining succulents in large containers that can be moved into a frost-free area in winter where necessary.

The book contains many useful tips for propagating and maintaining these plants, such as how to transplant "armed and dangerous" large agaves. (I'll break out the carpet remnants the next time I repot my puyas.)

The first part of the book is devoted to design and cultivation, and the second part to a plant catalogue arranged by size, from "tall, treelike, and immense" down to "small, low-growing, and groundcover" succulents. A chapter "Companion plants" suggests combinations with non-succulent perennials, annuals, bulbs, and woody plants.

"Resources" lists places to see good collections of succulents, and a few vendors. A bibliography and an index complete the volume. I recommend this book

to gardeners in warm (Zones 9–11) climates, container-garden experts with big greenhouses, and those who just love to indulge in zone denial.

California's Wild Gardens: A Guide to Favorite Botanical Sites, ed. by Phyllis M. Faber. Berkeley: University of California Press, 1997. ISBN 0-510-24031-6. xii + 236 pp., color photos throughout. Large-format paperback, \$34.95.

Those of us who live on the Pacific coast of North America are often asked by visitors from elsewhere to recommend the best places to see wild plants in flower. Although I grew up in California as a native plant enthusiast from childhood, I'm not very good at answering this question. Thus, I was delighted to come across this book, published 10 years ago but until now unknown to me, in the gift shop of a small California natural history museum, and I'd like to bring it to the notice of readers despite its age.

The oversized volume, printed on heavy coated stock, opens with an introduction explaining such aspects of California's plant ecology as geological history, climate, fire, habitat loss, vegetation types and plant communities, and various threats to plant diversity and possible responses to these threats. The book was published under the auspices of the California Native Plant Society and the California Department of Fish and Game. The CNPS keeps its own list of "rare and endangered" plant species and classifies under these headings far more species than the state and federal agencies do.

The remainder of the book is organized into geographical sections, each with three or more sites described. Most of these sites are accessible to the public as national, state, or county parks, but a few are on private land or are special conservation areas that can be visited only by arrangement with the authority in charge of them. The brief text for each site includes details of habitat destruction and actual or envisioned conservation plans. Each site entry is written by a contributor intimately familiar with the area.

The photographs, which occupy more of most pages than the text does, are almost all of very high quality and illustrate both the landscape and a selection of notable plants, especially endemic or rare species to be seen at a given place. Extensive sidebars explain the photos and their significance.

Back matter includes a count of rare and endangered plants by county, a brief glossary, a list of private and public agencies involved in plant conservation in the state, a useful bibliography, and a good index that combines place names, plant names (botanical and common), personal names, and other subjects. Authors' and photographers' addresses (as of 10 years ago) are listed.

Having this book makes me determined to spend more time in my native state, just one or two days' drive to the south of my present home. How could anyone look at the photos of the bizarre root parasite *Pholisma sonorae* in the Algodones Dunes (Imperial County) and not want to go there and see it?

NARGS National Awards 2007

Marguerite Bennett

The North American Rock Garden Society offers various awards for contributions to different aspects of rock gardening. This year the only award for which members were nominated was the Award of Merit, given for exceptional service to the Society.

Nominations are sought annually for this and the other awards: the Marcel Le Piniec Award, for a nursery grower, propagator, of plant explorer; the Edgar T. Wherry Award, for outstanding contributions to the dissemination of botanical and horticultural information about native North American plants; the Carleton R. Worth Award, to an author of distinguished writings about rock gardening and rock garden plants, especially as published in this journal; and the Marvin E. Black Award, for promoting NARGS membership and organizing meetings and other Society activities. Please consider recognizing those who have contributed in these ways. For further information, please contact the President at the address given on the inside back cover of this issue.

Award of Merit: Joyce Fingerut

From local chapter to national and international activities, this Award of Merit recipient has brought efficiency and organizational abilities to NARGS. As national vice president, then president, and while serving on various NARGS committees, Joyce Fingerut has given unstintingly of her time and talents to keep our organization running smoothly.

Next came the task of clearing the way toward a more efficient and acceptable method for the NARGS Seed Exchange to proceed with international importation of small packets of garden seed. This major hurdle was solved thanks to her perseverance and determination in working with NARGS members state-side and abroad and with federal agencies.

Most recently, the 2006 International Interim Rock Garden Plant Conference in Utah took several years of planning and involved dealing with the endless

details of this major event. Joyce was at the center of it all. The success of the conference keeps NARGS and rock gardening in the forefront.

Thank you, Joyce for your unflagging efforts on behalf of NARGS. You truly represent the spirit of the Award of Merit.

Award of Merit: John Bieber

A dedicated volunteer and organizer, skilled horticulturist, and talented propagator, over the past 40 years John Bieber has shared his talents and skills, enriching the Long Island Chapter, forming the Daphne Society, lecturing and teaching rock gardening classes, and generally promoting NARGS at the local, national, and international levels. Thanks to John's generous, "can-do" spirit, the Long Island Chapter continues to flourish, the horticultural world is infused with daphne awareness, and there is a display garden for daphnes at the Planting Fields Arboretum. Along with all this he continues to share plants at chapter sales, photograph rock garden plants, and open his garden to anyone interested in rock gardening.

In recognition of these contributions and many more known to his garden friends and fellow enthusiasts in NARGS and allied societies, John Bieber is chosen to receive the NARGS national Award of Merit.

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Western Winter Study Weekend: February 29–March 2, 2008. “Plant Treasures for the New Millennium.” Hosted by Alpine Garden Club of British Columbia. Delta Richmond Inn, Richmond (near Vancouver), B.C. Registrar: Moya Drummond, 3307 W. 6th Ave., Vancouver, BC V6R 1T2; 604-738-6570; moyadrummond@shaw.ca

Eastern Winter Study Weekend: March 28–30, 2008. Hosted by the Berkshire Chapter. Marriott Hotel, Farmington, CT (near Hartford). For details, visit www.nargs.org.

2008 Annual General Meeting: June 12–15. Ottawa University, Ottawa, Ontario, with field trips to unique vegetation communities. Hosted by Ottawa Valley Chapter. Registrar: Randy Mason, P.O. Box 9504, STN-T, CSC, Ottawa, ON, Canada K1G 3T7.

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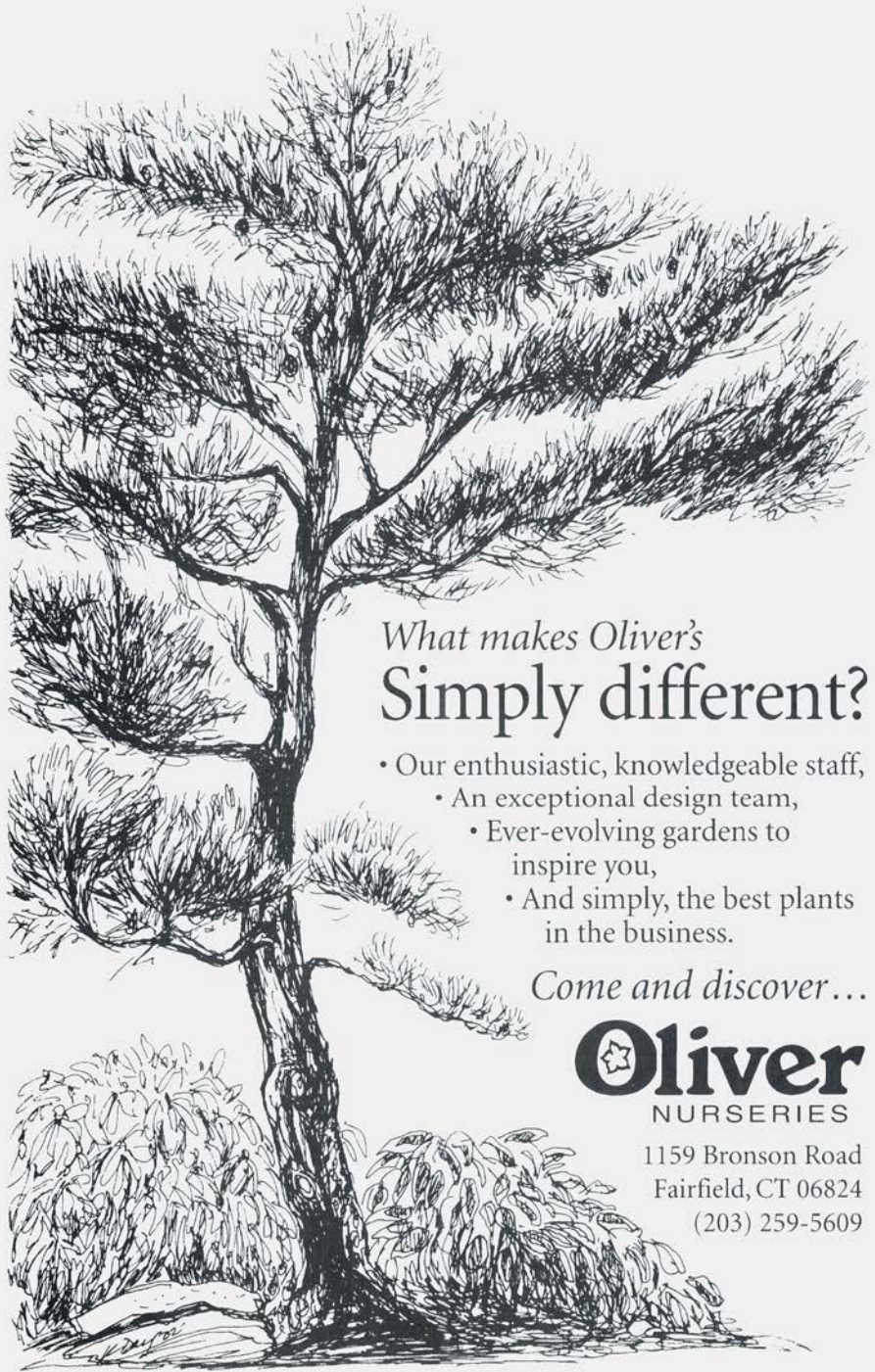
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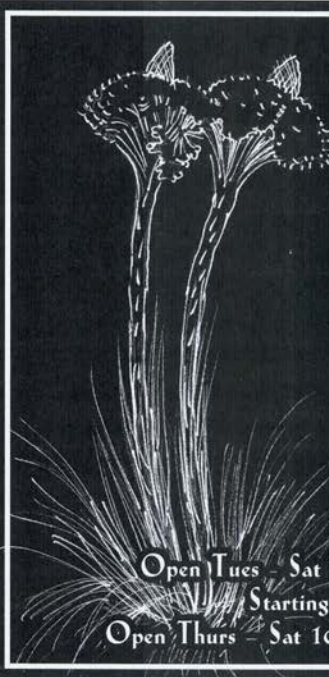


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