

NORTH AMERICAN ROCK GARDEN SOCIETY

The Rock Garden

QUARTERLY

FALL 2018



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All illustrations are by the authors of articles unless otherwise stated.

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QUARTERLY

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From the Editor

FALL IS PERHAPS my favorite time in the garden. Spring, for me, is always a bit of frenzied panic, running around trying to plant everything, wondering what I was thinking when I ordered all those seeds, and worrying endlessly about late frosts and early heat waves. Summer starts off well but becomes a long slog through the heat and weeds, but fall is just about perfect. There are chores, but plenty of time to do them, and working in the garden in the cool, crisp days is a genuine pleasure. Fall is when I build new beds, walk around taking stock of what worked and didn't work in the past year, and generally take a deep breath and start enjoying the garden.

My usual process of taking stock of the garden this fall has been extra interesting because this fall marks the end of my first full year of living in coastal Virginia, a much hotter, wetter climate than I'm used to. I put in a lot of alpines last fall, fully expecting most of them not to make it, and I've been surprised by what is still alive. All my daphnes are still alive, which I was not expecting, and other things I always thought of as perfectly tough and reliable, like *Onosma taurica*, completely melted. All gardening is trial and error, I think. Now it is time for me to plant more of what lived, and try a bunch of new things that may or may not thrive.

This year I've added collecting seeds to my fall to-do list because this year I'm finally going to send in seeds to the NARGS seed exchange. The seed exchange is one of the very best benefits of being a member of NARGS, but I'm a bit embarrassed to admit that I've never gotten organized enough to contribute. Not this year! It is turning out to be very easy and extremely pleasant. I like walking around the garden, cutting seed heads into paper bags to dry, and imagining someone else getting to enjoy a plant that I've enjoyed. If you've also never contributed seeds, I hope you'll join me. Read about the seed exchange in the Bulletin Board section of this issue, and then find all the information you need to become a Donor on our website, at: <https://nargs.org/seed-donation-instructions>

I also think of fall as the time for making plans for the garden and dreaming a few dreams, and this issue has articles to spur both of those activities. We've got several articles full of practical tips and ideas for your gardening plans in the coming year: growing cyclamen, succulents in troughs, and, especially for those of us who garden in hot, difficult climates, an article on rock garden plants that

have done well in St. Louis, Missouri. This issue also offers a couple of preview articles on the upcoming Spring Study Weekend hosted by the Delaware Valley Chapter May 3-5 2019. Mark that on your calendar, because it is going to be an exceptional meeting, with some fascinating sites to visit and a top-notch slate of speakers.

And then there are the dreams. Yunnan, China, is one of the most botanically diverse places in the entire world. Someday I'm going to get there in person, but until then, I can flip through the pages of the last article in this issue. As you probably know, NARGS Tours and Adventures took a trip to Yunnan this summer, and many of the participants in the tour contributed to this article about their experience. I love seeing the gorgeous plants I've lusted after for years (blue poppies, anyone?) and it is also fun to see familiar garden plants like *Paeonia delavayi* growing in the native habitat. I can't get to China to see them in person right now, but I am glad I can sit back in my fall garden and dream. By the way, I was only able to fit a fraction of the incredible photos from this trip in the print copy of this issue, so be sure to look at the digital version at <https://nargs.org/rock-garden-quarterly> to see many more gorgeous shots.

Finally, I want to thank everyone who sends me e-mails or letters with feedback or ideas. I love hearing what you like or don't like about the *Quarterly*, and specific ideas of topics you'd like to see covered are always extremely helpful. Please keep in touch, and please think about writing an article! As I said at the beginning of this... gardening is a lot of trial and error, and we all do better when we share our trials, errors, and successes with each other!





Cracking the Cyclamen Code

BETTY ANN ADDISON

TURNING THE CORNER in a woodland path at the Denver Botanic Gardens many years ago, I was blown away by hundreds of blooming cyclamen seemingly thrown down like a Persian carpet beneath the trees. A wild array of leaf patterns made each plant glow like a piece of carved jade. From that moment, it became an obsession to find out the secret for such rich abundance in a cold climate.

Who hasn't admired the potted cyclamen that must be wintered indoors? These cyclamen are derived from *Cyclamen persicum*, which still adorns the mountains of Persia (modern-day Iran). It, and the many species that are widespread in Europe and Asia, often grow in woodlands. Chasing a Minnesota hardy species has led down many a dead end. I won't bore you with the details of the species I have tried that wasted time, money, and emotion.

The elusive plant was right under my nose all the time. *Cyclamen purpurascens* is the sole cyclamen that I have found reliably hardy here (Minneapolis, Minnesota) without winter cover. In addition, it displays its beautiful leaves and flowers all summer, not going dormant like most others. However, just like a lot of desirable plants, *C. purpurascens* must be happy in the summer to be hardy in the winter. I had tried this species before, putting it in rich soil in shade. It dwindled and finally expired. Imagine my delight the next spring, as I was tidying up a patch of *Epimedium* × *rubrum* across the yard, when I found two cyclamen seedlings flourishing under its leaves. Ants must have carried

the cyclamen seed across the yard from the now-deceased mother plant. They were tucked in among the epimedium roots, certainly a dry spot. That was my first hint that, just like rhododendrons, the first rule of cyclamen growing is drainage.

Coincidentally, that fall three years ago, I was given a generous amount of seed. Planted in humus-rich but



Cyclamen purpurascens blooming in the garden.

gravelly soil in pots in the greenhouse they rested until spring and then started to germinate, more and more every day. There were literally hundreds of them by May! What to do with them? A few were planted around my home in garden soil, but the bulk of them went to my rhododendron garden across the street.

When I purchased that property five years ago, it was pure sand under a forest of white oaks. We covered the gardens-to-be one- to two-foot (30-60 cm) deep with wood chips, watered and fertilized the area and let the chips decay. The soil became like chocolate cake and plants could be dug up with your hand. Rhododendrons on trial take up the center of the beds, but the edges, next to the logs marking the paths, turned out to be the perfect place to line out the cyclamen. Each plant was only as big as my thumbnail, but in expectation of future growth, they were placed six inches (15 cm) apart.

That first summer, it was clear that something was going on. By August the plants were as big as my palm, and a few were blooming! Meanwhile, the plants in rich garden soil with clay were merely surviving. They were only small novelties to be pointed out, whereas those growing in the woodland soil attracted attention on their own for their lush leaves and flowers.

Last spring, after a hard winter with little snow, I watched them with trepidation, hoping to find a few hardy ones. However, every single one of the plants in the woodland soil survived and soon started blooming! Individual plants were in bloom from May to November, and many rebloomed. Seedlings from the previous year emerged and were transplanted to expand the beds. Best of all, the leaf patterns

varied from highly marbled, to "Christmas Tree" forms with the center an image of a tree or maple leaf, to solid silver and all manner of individual variation. Flower color varied from pink to ruby, so the plants brought plenty of variety to satisfy my collector instinct.

If you plan to try these special plants, keep in mind that they do best in a well-drained, but moisture-retentive soil. A balance of air and moisture in the pore spaces of the soil is ideal: chocolate cake, not fudge! Choose a spot in filtered light or morning sun, or in the reflected light from a lawn on the north side of a building or evergreen. If the soil is sandy, add leaf mold to make a bed at least a foot deep. If your soil is clay based, make a raised berm edged with logs or rocks that will allow excess water to drain away. Watering in drought conditions will keep leaves turgid and plants producing flowers. Otherwise, life will retreat to the bulb to await a better day. In the right conditions, bulbs have grown from pinhead to teacup size here in just a few years.

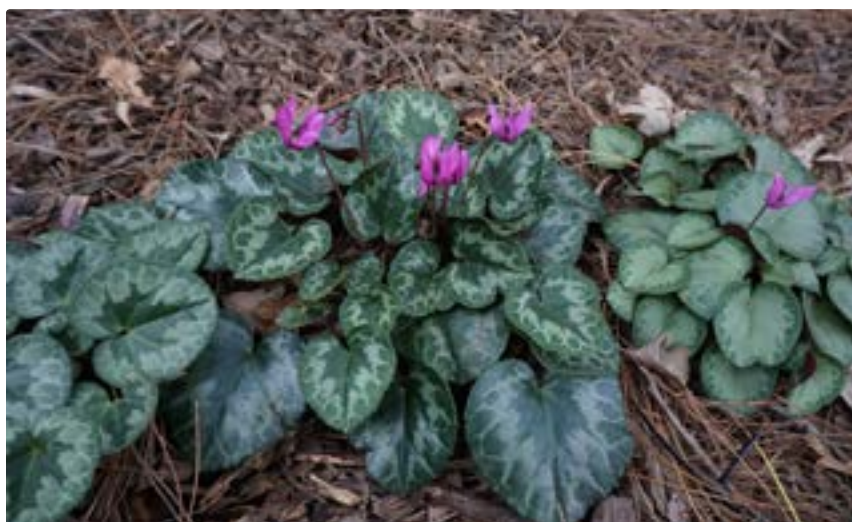


Seedlings showing Christmas tree and solid silver leaf patterns.

One of the fascinating things about cyclamen is the cunning way they plant their own seeds. Really. Once the flower is pollinated, the stem begins to curl downward, ending up in a tight coil surrounding the seed and tucked into the base of the leaves. There, the seed is safe from birds, but ants often carry it far away for its attendant nectar. That is how cyclamen disperse. In May, as the spring uncoils and the stem straightens downward, the seed is driven into the ground near the parent plant, thus creating one of those wonderful carpets I first saw in Denver.



Bare root cyclamen corm with developing seed pods on the ends of the distinctively curled stems.



Three different *Cyclamen purpurascens* seedlings with different leaf patterns showing some of the diversity of beautiful plants you can get when growing this species from seed.



How Shenk's Ferry Came To Be

JOHN F. GYER

SHENK'S FERRY WILDFLOWER Preserve, well known for its unique trillium, is the valley of Grubb Run, one of several glens that drain into the lower Susquehanna River. The river and its glens evolved as a tight braid of geologic history, plant migrations caused by changing climates, and the effect of at least 10,000 years of human habitation and development.

The river began around 550 million years ago as the Taconic Orogeny compressed, folded and heated sediments of a previous era as it thrust them into mountains. Now only the hard, erosion-resistant metamorphic rocks of the mountain core remain, exposed as the Piedmont of eastern North America. Weathering and erosion stripped away the softer mountain rock. Rivers carried the sediments to the sea. One of these rivers became the lower Susquehanna.

Later the rise of the Appalachian Mountains to the north and west created a drainage basin that extended through Pennsylvania and into south-central New York. Rock weathering and erosion wore down these mountains throughout the Mesozoic Era, the age of dinosaurs, and the Cenozoic, the age of mammals and birds. Now, just as it has for about the last 400 million years, the Susquehanna continues to carry ground-down remnants of mountains to the sea.

A series of continental glaciations in the Pleistocene Epoch gave the Susquehanna Valley its most recent sculpting. Although the glaciers terminated a bit north of the lower Susquehanna, their immense weight dimpled the land, and their melting sent massive floods that scoured the valley into the broad canyon we see today.

About 10,000 years ago, Native Americans came to the valley to hunt, fish, and work their farms. European colonists continued forest clearing for larger farms, towns, and factories. The river became an artery for commerce. Railroads and canals followed its valley. Local limestone was "burned" for plaster and mortar to build cities. During the 1930s, its rapids were dammed so the Susquehanna's power could turn the motors of commerce and light the night far beyond the valley.

Whenever I visit the valley, I am awed by the resilience of nature in the face of centuries of human impact. Shenk's Ferry Wildflower Preserve is a good illustration. In the 1700s Shenk's Ferry had its eastern terminal on flat land just upriver from Grubb Run. That land is now

Opposite: *Saxifraga virginensis* at Shenk's Ferry



The exact identity of the pink and white trilliums around Shenk's Ferry are up for debate.

crowded with trilliums each spring, just as it was before the ferry. In the late 1800s and early 1900s, Grubb Run saw an explosion (literally) of industry and commerce. Three railroads left their mark on the preserve, one at river level, one near the upper edge of the preserve, and one that left only the remains of a pylon for a bridge that was never built. A few houses and small factories nestled in a flat area at the upper end of Grubb Run. In 1907 a dynamite plant exploded, killing 11 people. The community was abandoned. Forest and a naturally diverse plant community reclaimed the land.

Trilliums make the steep sides of Grubb Run special in the spring. Typically the flowers are white and flat in profile like *Trillium erectum*. In the 50 or so years that I've enjoyed them, I've heard these plants called *T. erectum* 'Alba', *T. erectum*, *T. flexipes*, or a hybrid swarm of *T. erectum* and *T. flexipes*. My preference is just to call them the Shenk's Ferry trillium, even though the type is also found in other glens on the north side of the river.

Some time ago Dr. Richard Lighty, then Director of the Mt. Cuba Center, observed that along the Susquehanna north of Harrisburg, *Trillium erectum* typically had red flowers. A bit south of Harrisburg, petals blended streaks of white with streaks of red. At Shenk's Ferry flowers were generally white with peach-colored ovaries but rarely plants with red-streaked petals stood out in the population. To him, this suggested that, probably due to the ebb and flow of glacial climates, red *T. erectum* from the north moved south where they met *T. flexipes* moving north from populations to the south and west. Hybridization produced the Shenk's Ferry form while the southwest side of the river remains more like *T. flexipes*.

Brian Carson showed Dot Plyler and me a population of *T. erectum* in southwestern Quebec that suggests another possibility. In that population, the *T. erectum* had frequent yellowish, white, and bicolored forms as well as the expected red ones. Continental glaciation would surely have destroyed them in Quebec, but they could move south as the climate became colder. The lower Susquehanna may have served as a refuge for such color variation that, as Dr. Lighty suggested, was diluted by hybridization with other species moving north and east as glacial climates eased.



Saxifraga virginiensis



Dicentra cucullaria

Trillium is only one of many genera at Shenk's Ferry. Once the dirt road drops to river level, it runs along steep slopes on the left and a well-vegetated railroad embankment on the right. A bit before trillium time, the slopes are alive with Virginia bluebells (*Mertensia virginica*) and Virginia saxifrage (*Saxifraga virginensis*). The blue marsh violet (*Viola cucullata*) grows below some seeps. Dutchman's britches (*Dicentra cucullaria*) brightly greet visitors from both the slopes and the railroad bank. Squirrel corn (*Dicentra canadensis*) is there too, though less common.



Viola cucullata



Erythronium albidum

There is very limited parking across the Grubb Run Bridge, but a jeep road continues uphill. Trilliums cascade down the road cut where they can be photographed in some comfort at eye level. As you go higher, the roadsides level somewhat, and the rattlesnake fern (*Botrychium virginianum*) grows among the trilliums.

The gated main trail is on the north side of Grubb Run. It runs upstream, ducks under a power line from Safe Harbor Dam, and terminates at the masonry overpass of a Conrail line.

The white trout lily (*Erythronium albidum*) grows on the steep and muddy bank to the left of the trail – unfortunately about two-thirds of the way up. More accessibly, *Phlox divaricata* lines some sections of the trail and the white violet (*Viola striata*) is common. On the right, sharp eyes may spot a few leaves of the putty root orchid (*Aplectrum hyemale*).

Beyond the power line, trilliums are less common. But there may be a few showy orchid (*Galearis spectabilis*) at the trail's edge, protected from trampling by a ring of stones. The trail ends at the railroad overpass. The flat stones by the stream are a cool place for snacks, and the slopes offer a chance for a leg-stretching scramble. Scouring rush (*Equisetum hyemale*) grows in a seep above the stream and hepatica grows above the boulder field.

For explorers, ill-defined paths run east, roughly perpendicular to the main trail. The ruined settlement and dynamite factory lay along their tracery. Further east, the land rises as a trail runs along and well

above a stem stream of Grubb Run. Here the geology of basement rock changes to a shale that weathers into relatively acidic soil. The plants change too. With great luck and perfect timing, you can find *Obolaria virginica*, a saprophytic member of the Gentian family. Dwarf ginseng (*Panax trifolius*) is common there, though much easier to see along the trail from the River Road parking at Tucquan Glen further east.

Plant communities on the south side of the river seem subtly different from those on the north, possibly due to more intense and long-lasting development. At the intersection of Rt. 372 and McCalls Ferry Road, Lock 12 shows how river transport bypassed the Susquehanna rapids. A bit upstream, McCalls Ferry Road passes stone foundations being reclaimed by nature. It leads past an excellent roadside display of bloodroot (*Sanguinaria canadensis*) and Dutchman's britches. There are trilliums there, too, but they look subtly different from the Shenk's Ferry trillium. At Holtwood Dam they are more typically like *Trillium flexipes*.



Podophyllum peltatum (left) and *Caulophyllum thalictroides* (right)

Just beyond the dam a pawpaw (*Asimina triloba*) grove shelters a spread of toothwort (*Cardamine concatenata*) where later blue cohosh (*Caulophyllum thalictroides*) appears with a scattering of trillium and mayapple (*Podophyllum peltatum*). Dam building and the road gave openings for troublesome aliens like Tatarian honeysuckle (*Lonicera tatarica*) and a few *Ailanthus altissima*.

Our native pawpaw is the most useful and interesting tree at this pull-off. It belongs to the custard apple family (Annonaceae), and its fruit lives up to its family's common name. The pulp is edible with the texture of custard, but its fruit is filled with large seeds. The glacial climate of the lower Susquehanna was similar to areas well north of pawpaw's present range. As glaciers advanced, pawpaw had to move south, and the mammals of the late Pleistocene did the moving. As the climate warmed, the mammals returned and they inadvertently carried pawpaw seeds within them to repopulate the valley.

Upriver from the dam, rock weathering produces acidic soil. Rhododendrons spill down the slope of a tributary stream. Ferns and mosses fill open spaces where maianthemum runs much as it did when Native Americans were resident.

If you continue on McCalls Ferry Road to its Rt. 74 intersection and turn north toward York you will intersect Rt. 425. A right turn will take you past a panorama of farms until Rt. 425 plunges down to the shores of Lake Clark, the Safe Harbor Dam impoundment. On the right, Indian Steps Road is marked by a totem pole. Down that road, the life of the native people of the Susquehanna Valley is remembered at Indian Steps, a unique museum of their culture. The museum holds an extensive collection of arrowheads and stone hammers all decoratively embedded in its walls. On the second floor, early photographs are displayed that show the development of valley industrialization. Across the road, a hiking trail runs through typical eastern hardwood forest to a tributary stream that jumps from a ledge in its eagerness to join the river.

Past Indian Steps Road, Rt. 425 enters Otter Creek Historic Area with preserved mills, a picnic area, a boat launch, and great views across the lake toward Shenk's Ferry Glen. Past the creek, the road rises sharply, but there is a good trillium display on the left. The Urey Overlook parking is on the right at the crest of the hill. The overlook is well worth the half-mile (0.8 km) walk. The broad river spreads before you. Across the river Shenk's Ferry Wildlife Preserve and other downriver glens are covered in a bank of green, evidence that nature and man's activities continue the braid of history that began so long ago in the ancient Susquehanna Valley.



Spring in the New Jersey Pine Barrens

JANET NOVAK

NEW JERSEY IS a paradoxical state. It's the most densely populated state in the United States, and it's hardly the first place people think of for natural areas. However, New Jersey is among the top states in the nation in terms of the percentage of land protected from development. That status is thanks largely to the pine barrens in southeastern New Jersey, which is recognized as worthy of protection by both federal and state governments.

Why is the pine barrens so special? To residents of nearby cities, it's an accessible wild area. To naturalists, it's a unique habitat with many rare plant species, including one now found nowhere else. To gardeners like ourselves, it's a place with really cool plants.

To explain what the pine barrens is, first let me explain the setting. The southeastern half of New Jersey is in the Atlantic coastal plain, the zone of low, relatively flat land along the coast from Long Island to Florida. The Atlantic coastal plain, in general, is characterized by sandy and gravelly soils, typically acidic and low in nutrients. The soil is particularly so in the New Jersey pine barrens.

The sandy character of the soil means that it retains very little water. Instead, that soil acts as a filter, purifying water before it collects in a huge aquifer underlying the pine barrens. This aquifer explains, in part, why the region is protected from development. In the 1870s a Philadelphia industrialist was scheming to tap into that aquifer to supply pure drinking water for Philadelphia. In the ensuing outcry, New Jersey banned the export of water from the state. A century later, New Jersey partnered with the federal government to create the Pinelands Reserve, encompassing one-fifth of New Jersey's acreage, where development is limited.

That sandy soil means that upland areas in the pine barrens are very dry. That, combined with the acidic, nutrient-poor soil, limits the number of trees that can grow. Note that, on the coastal plain, "upland" isn't very far up. The highest point in the pine barrens is only 208 feet (63 m) above sea level, and a hill of only 121 feet (37 m) was deemed significant enough to be named "Mount Misery."

The uplands are dominated by pitch pine (*Pinus rigida*) and oaks, most commonly blackjack oak (*Quercus marilandica*) and post oak (*Quercus stellata*). These dry sites are susceptible to fire, and the pitch

Opposite: Pink lady's-slipper (*Cypripedium acaule*) can grow in surprisingly dry, infertile sites in the pine barrens.



Dieter Zschummel towers over a pygmy forest of pitch pines (*Pinus rigida*) during his 2015 NARGS speaker tour.

pine is exquisitely adapted to fire. In a moderately hot fire, a pitch pine may lose its branches but it can sprout new branches from old wood, even directly from the trunk. In a hotter fire, the pine may burn down to the ground but it can regrow from dormant buds at the base of the trunk. A fire that is hotter still may kill the trees outright, but the heat will also induce the cones on nearby trees to open, scattering their seeds just when they have open ground to take advantage of. Where fire is very frequent, the pine trees never have a chance to grow to full size. Entire forests can be under 6 feet (2 meters) tall. It's quite an experience to be able to look over the top of a pine forest!

Where the upland pine-oak forest is tall enough to have an understory, that's dominated by huckleberries (*Gaylussacia baccata* and *Gaylussacia frondosa*). In some places, black huckleberry forms a uniform carpet under the trees. In more open upland areas, we get some interesting dwarf shrubs. Bearberry (*Arctostaphylos uva-ursi*) is familiar to many, but do you know broom crowberry (*Corema conradii*)? This rare plant, a cousin of *Empetrum*, has deep green, needle-like foliage and a habit reminiscent of heath. A more common plant in this habitat is goldenheather (*Hudsonia ericoides*). Despite the common name, it is not in the same family as heather, but rather in the rockrose family (Cistaceae). In spring, goldenheather is graced by flowers



Goldenheather (*Hudsonia ericoides*) brightens dry, sandy areas in early spring.



Flowers (or, strictly speaking, inflorescences) of ipecac spurge (*Euphorbia ipecacuanhae*) emerge on naked stalks. Photo by Jason Ksepka.

of an unbelievably bright yellow. Here and there we find flowers of pink lady's slipper (*Cypripedium acaule*). A rather strange sight in spring is the flowers of ipecac spurge (*Euphorbia ipecacuanhae*). Before any leaves emerge, naked stalks are topped by pale green inflorescences, looking like something designed for a sci-fi movie. I've never heard of anyone gardening with ipecac spurge, but some forms have attractive foliage, and the plant stays compact enough for a rock garden.

In the upland forest in spring, we get to enjoy the huckleberries in bloom, but this can become monotonous. So let's look instead at moister areas: the pitch pine lowlands. Here, the surface usually looks dry, but the water table is only a foot (30 cm) or so below, easily accessible to the plants. The pitch pines still dominate, but the understory is more diverse and showier. Here, we find a greater variety of ericaceous shrubs, including highbush blueberry (*Vaccinium corymbosum*) and a lowbush blueberry (*Vaccinium pallidum*), as well as lesser-known ericaceous shrubs like staggerbush (*Lyonia mariana*), fetterbush (*Eubotrys racemosa*, syn. *Leucothoe racemosa*). All of these have pretty, white, urn-shaped flowers in spring. Showier is the sand myrtle



Sand myrtle (*Kalmia buxifolia*) is a charming member of the heath family.

(*Kalmia buxifolia*, syn. *Leiophyllum buxifolium*). This is a small shrub that can be covered with starry white flowers. It's also an excellent plant for a rock garden if it is given acidic, low-nutrient soil. For rock gardeners, the favorite is usually pixiemoss (*Pyxidantha barbulata*), a charming subshrub in the diapensiaceae family. The foliage does resemble moss, and the flowers look a lot like those of its cousin *Diapensia*. Pixiemoss starts blooming very early—sometimes in February—but fortunately for visitors, its bloom period is quite long, so we are almost sure to find it in bloom in early May.



Pixiemoss (*Pyxidantha barbulata*) is one of the few representatives of the family Diapensiaceae in the mid-Atlantic region. Photo by Jason Ksepka.



Northern pitcher plant (*Sarracenia purpurea*) in bloom in late May.
Photo by Jason Ksepka.

Let's move lower still, into the wetlands. Wetlands are where we find the greatest diversity of plant species. Wetlands are also where we find the fun plants—the carnivorous plants. In the acidic, low-nutrient bogs, plants have a hard time getting enough nitrogen. Carnivorous plants have solved that problem by letting the nitrogen find them, in the form of insects that they trap and digest. The carnivorous plant species in the pine barrens consist of one pitcher plant (*Sarracenia purpurea*), three sundews, and quite a few bladderworts. On the pre-conference trip, preceding the Spring Study Weekend we'll be able to see all three types.

You're probably already familiar with pitcher plants (*Sarracenia* spp.), which trap and digest insects inside leaves modified into the shape of pitchers. But did you know that those liquid-filled pitchers contain an entire food web of organisms? The remains of the trapped insects feed bacteria, which feed protozoa, which feed mites and other tiny invertebrates, which feed fly larvae. Some species of mosquitos lay their eggs almost exclusively inside pitchers. The larvae thrive on nitrogen-rich bacteria and insect remains. When they emerge as adults, they don't feed on blood because the larvae grew in a nitrogen-rich environment and don't need extra nitrogen from blood to be able to produce eggs.

In early May, the plants will still have their pitchers from last year, along with fat round flower buds. The new pitchers emerge only after flowering is done; it wouldn't be adaptive for the plant to eat its own

pollinators.

Sundews (*Drosera* spp.) have leaves covered with hairs, each tipped with a droplet of sticky fluid. That fluid causes the plants to glisten in the sun (hence the common name), and it also traps insects.

The least familiar of the carnivorous plants of the pine barrens are the bladderworts (*Utricularia* species). These plants, which grow in ponds or wet ground, have feathery leaves dotted with 1/8-inch (3 mm) bladders, which are spring traps. When a tiny invertebrate brushes against trigger hairs near the trap door, the door springs inward, sucking the victim inside. This happens fast: the trap opens and closes in only just two milliseconds. Most bladderworts have rather showy flowers that look something like toadflax (*Linaria* sp.) flowers, but in spring we will only see the leaves with their bladders.

Another fun plant of wetlands is a fern, but one that doesn't look remotely ferny. It's curlygrass fern (*Schizaea pusilla*). The sterile fronds look like curls of very fine green wire. The fertile fronds look just a bit like the metal ornament on the prow of the gondolas of Venice. The whole fern is so tiny that it's hard to spot. Most people never find this fern on their own until they are shown what to look for. On the pre-conference trip, we'll be showing people to a good-sized stand.

A final item on the list of fun wetland plants is golden-club (*Orontium aquaticum*), a plant in the arum family. Locals give it the



Threadleaf sundew (*Drosera filiformis*) traps small insects in droplets of sticky fluid on its leaves.
Photo by Jason Ksepka.

charming common name of never-wet because water beads up and rolls right off the leaves. (This is assumed to be an adaptation to prevent mud from collecting on the leaves and blocking out the sunlight.) The flowers are—you guessed it—golden and club-shaped. They bloom in spring and are sometimes numerous enough to create a band of gold along the edge of a lake.

The wetlands are also home to numerous orchid species. In spring, the only wetland orchid we might see in bloom is southern twayblade (*Neottia bifolia*). Compared to a pink lady's slipper, the southern twayblade is almost comically homely. The flowers are tiny and brownish. It also typically grows in the heavy shade of white cedar swamps, making it still harder to spot. Later in the year, the pine barrens have showy wetland orchids: the pink of rose pogonia (*Pogonia ophioglossoides*); grass pink (*Calopogon tuberosus*) and dragon's mouth (*Arethusa bulbosa*) in June and the white, yellow, and orange of *Platanthera* species in July.

The wetlands, like the uplands, are home to some ericaceous shrubs and sub-shrubs, notably cranberry (*Vaccinium macrocarpon*). This species is the same one grown commercially, and New Jersey is the third largest producer of cranberries in the United States.

The pine barrens, despite its unusual environment, is home to a fair number of horticulturally important species. In addition to the blueberries and cranberry already mentioned are sweet pepperbush (*Clethra alnifolia*), possumhaw viburnum (*Viburnum nudum*), red chokeberry (*Aronia arbutifolia*), American holly (*Ilex opaca*) and inkberry holly (*Ilex glabra*). A plant known to rock gardeners is stiff aster (*Ionactis linariifolia*, syn. *Aster linariifolius*). Seeing these plants in the wild can be inspirational for the garden, especially if your soil is acidic or if you have wet areas. And if you fall in love with bog plants, you can easily grow many of them in an artificial bog, even in a small container.



Sterile fronds of curlygrass fern (*Schizaea pusilla*). The fern is tiny; those spirals are less than a half inch (12 mm) across. Photo by Terry Schmidt.



Rooted in Diversity
NARGS 2018

The Delaware Valley Chapter
NARGS Spring Study Weekend, May 3-5, 2019

The Delaware Valley Chapter is pleased to host the 2019 NARGS Spring Study Weekend featuring an excellent lineup of speakers, tours, and events. The following detailed information should help you plan. Although there is a registration form included here at the end of this writeup, we recommend that you register online at <http://www.dvcnargs.org/studyweekend.html>

We accept credit cards at this site but you may register online and then send in a check. All checks must be drawn on a U.S. bank.

Transportation

Our meeting location, The Sheraton Great Valley Hotel, is located about 25 miles west of Philadelphia at 707 East Lancaster Avenue (US Route 30), Frazer, PA 19355 (the intersection of US 202 and US 30). There is free parking at the hotel. Philadelphia International Airport (PHL) is closest to the hotel and is served

by all major airlines and car rental agencies. It's a 45 to 60 minute drive to the hotel depending on traffic conditions. A ride with Uber or Lyft from the airport straight to the hotel costs about \$50 and will save time. A taxi ride is more costly.

It is possible to take the train instead of a plane. Use Amtrak to go to 30th Street Station, Philadelphia, and then switch to our regional rail system, SEPTA, and go to Paoli on the Paoli/Thorndale line. There is also a direct train on Amtrak's New York City/Harrisburg line which stops at Paoli twice daily. The hotel runs a free shuttle to and from the Paoli and Exton train stations; call 610-524-5500 to be picked up. A taxi from the Paoli train station to the hotel is about \$25 and the phone number for it is 610-666-6666. Uber and Lyft are also available.

Accommodations

We have made arrangements for a block of rooms at the Sheraton Great Valley for \$119 per night plus tax. A link to our dedicated hotel is <https://www.starwoodmeeting.com/Book/dvcnargsmay2019>. Using this site will assure you receive the low rate. Or you may call 1-800-325-3535 and ask for the DVC-NARGS rate. You must book your hotel reservation by April 1, so do so as soon as you know your plans. There is high demand for hotel space due to graduations and weddings in May. This rate will apply for two days before and two days after the meeting based on availability. The cancellation policy for your reservation is 72 hours.

Registration for the Conference

The conference registration fee is \$425 and includes all programs and meals from Friday night, May 3, to Sunday breakfast, May 5. Registrations are due by March 1, 2019. This includes our Friday night appetizers, Friday night buffet, Saturday morning breakfast buffet, our bus tour (with a box lunch) to Mt. Cuba Center in Hockessin, Delaware as well as two private gardens in the Brandywine Valley, Saturday night appetizers, the Saturday night banquet, and the Sunday morning breakfast buffet. Cash bars are available both nights.

Registration for the Pre-Conference Trip

For the two-day pre-conference trip, Thursday, May 2, and Friday, May 3, we will travel from the hotel by van. Box lunches are included, but other meals and room accommodations are on your own. The cost for just the pre-trip is \$190. Further details are ahead.

Program Synopsis (subject to minor changes)

Our official events begin on Friday with registration, plant show check in and judging, the plant sale with many great vendors, the book sale, dinner, and lectures. Details about the private garden visits, plant show, book sale, and plant sale will be sent to registrants. On Saturday there is breakfast and a bus trip to private gardens plus Mt. Cuba Center, with lunch at Mt. Cuba. Later in the day we have the plant show, plant sale, happy hour, dinner, and lectures. Then on Sunday we begin with a breakfast buffet and have the final plant sale, lectures, and announcements. There will also be local private gardens open on Friday morning and early afternoon as well as on Sunday afternoon after the meeting closes.

Speakers

We are celebrating our roots in horticulture with an inquisitive look at ecosystems near and far. Local experts will show us the exciting plants that grow in the understory of our eastern temperate woodlands, in the unique pine barrens, and in marginal areas and salt marshes. Global experts will introduce rare plant communities as we circumnavigate the globe. Our speakers will make presentations after dinner on Friday, after our banquet on Saturday, and after breakfast on Sunday morning.

Keynote: Sarah Carlton

As the Alpine and Woodland Supervisor at St Andrews Botanic Garden, Fife, Scotland, Sarah has responsibility for managing the Rock Garden, Woodland and Pinetum, and the Alpine Display House. She is passionate about all things Alpine (and sub-alpine!), and has worked and travelled in the Swiss Alps, China's Yunnan mountain ranges, the Russian Altai, and Kyrgyzstan. She will be presenting two lectures, one focused on

the alpine collection at St. Andrews, its notable plants and the evolution of the collection, and the other on her global travels exploring plants that grow in some of the most extreme climates.

Mini-Keynote: Dr. Peter Zale,

Peter Zale, Ph. D, earned his doctoral degree from The Ohio State University where he studied plant germplasm collection development, breeding, and genetics. He is currently Associate Director of Conservation, Plant Breeding and Collections at Longwood Gardens. He has participated in over 20 plant collection expeditions to countries such as: Japan, Vietnam, Myanmar, Georgia, and Azerbaijan. Dr. Zale is an expert in a wide range of woody and herbaceous flora and will be sharing his passion for plants from the Caucasus, discussing why we are searching in this region for new and exciting plants.

Mini-Keynote: Michael Bone

For over 16 years Michael Bone has worked for Denver Botanic Gardens where he is currently the curator of the steppe collection. He is one of the authors of *Steppes: The Plants and Ecology of the World's Semi-arid Regions*, the seminal work on plants of the Steppe eco-region written in collaboration with his world-renowned peers at DBG. He will be presenting plants of the steppes and provide tips and techniques for integrating these plants into your garden.

Focus on our Local Roots (3 Speakers):

Gregg Tepper

Having worked for Mt. Cuba Center in Hockessin, Delaware, and now leading the Horticulture Team as the Director of Horticulture at the newly established Delaware Botanic Gardens, Gregg Tepper is known as one of the East Coast's leading experts on native plants. Gregg also ran his own design build and estate gardening company. With his extensive knowledge of ecosystem dynamics, creativity for outstanding plant combinations, and ability to balance beauty and function he is a sought-after lecturer. He will be presenting the diverse and ecologically rich plant communities within the Delmarva Peninsula.

Janet Novak

The current president of DVC-NARGS and an avid gardener and local plant expert. Janet has traveled extensively and is a leading expert on rock garden and alpine plants. She will be presenting the rare and unusual plants found within one of the nation's most intriguing plant communities, the pine barrens of New Jersey.

Mike Slater

Mike is a columnist for the *Reading Eagle*. As a local expert on the flora of the Northeast, Mike is well known among alpine and rock garden enthusiasts as a writer, an active member with the DVC-NARGS, and a staple at the Philadelphia Flower Show. In addition to being an expert on plants, Mike is also skilled and respected in the field of entomology and is an ornithologist. He will be presenting the unique flora of the serpentine barrens.

Saturday Bus Trip

Our Saturday bus trip will have us all visiting two private gardens plus Mt. Cuba Center (www.mtcuba.org), on two buses which will leave at the same time. One bus will take us first to Rad MacFarland's garden in Wilmington, DE, known for its diverse rock garden, woodland plantings, and excellent large troughs, mostly made by Rad. The other bus first visits Wayne Guyman's garden in Chadds Ford, PA. It has a huge pond with an island, a hillside planted with thousands of hostas in colored ribbons, and countless azaleas and sun-loving perennials. It has been featured in *Martha Stewart's Living*. Next we will eat our box lunches at Mt. Cuba and enjoy guided tours. When we depart, the first bus will go to the Guyman garden and the second bus will go to the MacFarlane garden, and then we will return to the hotel in time for events.

Pre-Conference Trip

The study weekend locale provides easy access to some wonderful botanical sites. The two parts of the trip are connected, but we will return to the hotel each night. We'll see widely differing habitats with distinctive and beautiful plants.

On Thursday we go southwest to a part of Pennsylvania with diverse geology and consequently high plant diversity. We start

with an exceptional example of eastern woodlands: Shenk's Ferry, which is one of the region's great sites for wildflowers (see the article on Shenk's in this issue of the *Quarterly*). We're aiming for peak bloom time of trilliums, which carpet the ground. Shenk's Ferry has many other wildflowers and ferns, including some regional rarities. We will also visit a serpentine barrens, which has a completely different suite of plants, including rock-garden-compatible plants such as *Phlox subulata* and *Cerastium arvense* ssp. *velutinum*. (An article on the region's serpentine barrens will appear in the winter issue of the *Quarterly*).

On Friday we go east for one of the region's most distinctive habitats: the New Jersey Pine Barrens (see the article in this issue of the *Quarterly*). Here we will see a forest of pitch pines (*Pinus rigida*) dwarfed by extreme conditions and frequent fire. We'll see sand myrtle (*Kalmia buxifolia*, syn. *Leiophyllum buxifolium*) and the famous pixiemoss (*Pyxidantha barbulate*), a cousin of *Diapensia*. We'll visit one or more bogs to see the northern pitcher plant (*Sarracenia purpurea*), sundews (*Drosera species*), the tiny, unfernlike curlygrass fern (*Schizaea pusilla*), and many other fascinating plants.

Guides: Each day, we will have three guides with a thorough knowledge of the plants, so someone will always be on hand to identify a plant or to answer questions.

Practicalities: The two-day event is limited to 39 participants. It will consist of two trips, each departing from the conference hotel (Sheraton Great Valley in Frazer, PA). The walks will be mostly easy, but with some moderate hills and rocky ground. The cost per person is \$190, which includes transportation (by vans) and lunches. Pre-conference trip participants are responsible for their own breakfast, dinner, and hotel arrangements. The conference hotel is offering a discounted room rate on Wednesday and Thursday nights, but the discount is subject to availability. Therefore, we recommend reserving your room promptly. The hotel has two full service restaurants and there are many other food options nearby.

Program

(Subject to minor changes)

Time	Friday, May 3, 2019
12 Noon to 5 PM	Registration Check In and obtain Packets.
3 PM	Hotel Room Check in
3 PM to 5 PM	Sales Areas Open
5 PM to 5:45 PM	Happy Hour
5:45 PM to 7 PM	Buffet Dinner
7 PM to 7:15 PM	Welcome and announcements
7:15 PM to 8:05 PM	Local Roots
8:05 PM to 8:55 PM	Keynote
8:55 PM to 9 PM	Closing announcements
9 PM to 10 PM	Sales Areas Open
Time	Saturday, May 4, 2019
6:30 AM to 8 AM	Buffet Breakfast
8 AM to 8:30 AM	Load busses and leave by 8:30
8:30 AM to 3 PM	Field Trip with box lunches
4 PM to 5 PM	Sales Area Open
5 PM to 5:45 PM	Happy Hour
5:45 PM to 7 PM	Banquet
7 PM to 7:15 PM	Announcements
7:15 PM to 8:05 PM	Mini-Keynote
8:05 PM to 8:55 PM	Keynote
8:55 PM to 9:00 PM	Closing announcements
9 PM to 10 PM	Sales Area Open
Time	Sunday, May 5, 2019
6:30 AM to 8 AM	Buffet Breakfast
8 AM to 9 AM	Sales Area Open – final
9 AM to 9:15 AM	NARGS 2019 Annual Awards
9:15 AM to 10:15 AM	Mini-Keynote
10:15 AM to 10:20 AM	Closing

Registration Form

NARGS 2019

Rooted in Diversity

The Delaware Valley Chapter of the North American Rock Garden Society
Spring Study Weekend - May 3-5, 2019

We greatly prefer that you register through the Delaware Valley Chapter Website (<http://www.dvcnargs.org/studyweekend.html>) but if you do not have computer access, please fill out this form and send with a check payable to "DVC-NARGS."

The deadline is March 1, 2019 for the main event as well as for the pre-conference trip.

Mail to: Liane Schleifer, 3612 Prestwick Dr, Tucker, GA 30084-2421, USA

If more than one member of a household is registering for the meeting, please complete a registration form for each person.

Name: _____

Mailing Address: _____

City: _____ Prov./State: _____ Postal/Zip code: _____

Country: _____ Email: _____

Phone: (_____) _____ NARGS Chapter _____

Friday Buffet: Chicken ___ Salmon ___ Vegetarian ___

Saturday Box Lunch: Hoagie Wrap ___ Turkey Club Wrap ___ Vegetarian ___

Saturday Banquet: Chicken ___ Cod ___ Vegetarian ___

Other special dietary requirements: _____

Meeting Registration: \$ _____ \$425.00

Meals ONLY for those not registered for the meeting: \$ _____ \$187.00

Two-Day Pre-Tour: \$ _____ \$190.00

(Limited to 39. You must register for the meeting to be eligible for the Two-Day Pre-Tour)
(DVC Chapter Members will be waitlisted for the Pre-Tour. \$190 will be billed if you clear the wait list)

Total: \$ _____

NOTE: No refunds after March 1, 2019. Cancellations subject to \$25 processing fee before March 1, 2019.

Alpines in Low (elevation) Places: Rock gardening in Missouri

MARIEL TRIBBY

HORTICULTURALLY, 2013 WAS a big year for me. I had just graduated from Longwood Garden's Professional Gardener Training Program and completed internships at the Royal Botanic Garden Edinburgh in Scotland and Lautaret Alpine Botanical Garden in France. It was on the second interview at Missouri Botanical Garden that I caught my first glimpse of the newly-renovated Bavarian Garden. It had been transformed into a rock garden, and I remember thinking, "I would love to have this garden" as I took in the sandstone boulders and beds waiting to be filled with plants. During the interview, I had mentioned my interest in alpine plants and here was a new garden dedicated to alpines! At the same time, I knew I was applying for a different area of the garden, so was only hoping that I would be able to help out from time to time. I moved to St. Louis two months later to start my new position, blissfully unaware of the challenging climate that awaited this novice rock gardener.



Looking east at the Bavarian Garden under construction.

The renovation of the Floyd Pfautch Bavarian Garden began in late 2012 and had just finished as I arrived at Missouri. I became involved with plant selection and planting in late spring of 2014. That first year, we ordered plants from Arrowhead Alpines and Wrightman Alpines. We also planted a generous donation of plants from Mike Kintgen and Denver Botanic Gardens. Since then, we have grown plants almost exclusively from wild-collected seed sourced from *Indices Semina* and seed exchanges. Here I have to mention our talented wild-species propagator Justin Lee, who produces countless quality plants for this garden each year.

The garden serves as an extreme trial for these plants. Can they quickly adapt to a harsh climate that is almost the opposite of their native environment? These conditions may become a reality for alpine plants due to climate change. Another function of the garden is to add diversity to our collections, particularly plants of conservation concern. Alpines face several threats including climate change, human development, and overgrazing. Due to the high number of threatened species, including endemics, many alpine areas are considered biodiversity hotspots in need of conservation. By pushing the boundaries and displaying these plants to our visitors we can raise awareness of the threats and increase appreciation of this flora.



View of the Bavarian Garden facing west.

Structure of the Garden

The beds are laid out in a series of terraces and slopes bounded by sandstone boulders. The soil in these original beds is a mix of topsoil and Turface (a fired clay soil amendment), which has proven too heavy and moisture-retentive. The flat areas on the terraces also have problematic drainage, so the slopes have become very valuable space. I use expanded shale extensively around the crowns of plants and incorporate it into the soil at planting time in these beds, but this does little to help with drainage. Luckily, there has been room to build up new beds within the garden. When I inherited the garden in 2014, several areas had been left rather flat and devoid of rock. Over the years, I have raised these areas and used different soil mixtures to help increase drainage. My first mixes combined equal parts topsoil,



Teucrium montanum growing in a crevice bed.

coarse sand, and expanded shale, which resulted in some increased plant survival. Most recently, I have added a bed using a base layer with 50% topsoil and 50% expanded shale. The base layer was about 1.5 feet (45 cm) deep. On top of that is a layer of 50% coarse sand and 50% expanded shale. The top layer varies from 1-2 feet (30-60 cm) deep. This two-layer system, which keeps the crowns of the plants dry, but encourages the roots to grow deep for moisture from the base layer, is the most successful growing format so far.

The garden came to me accessorized with large cast stone concrete troughs. I quickly discovered the fun of creating a small landscape within a trough, which showcases the more diminutive plants that get lost in the large terrace beds. I also tried several mixes within these troughs, blending equal parts compost or topsoil with sand and expanded shale. Like the beds, these troughs hold more moisture than is favorable, but I have also had more success with keeping plants for longer periods of time in troughs. Last year, I used some of the 50% coarse sand, 50% expanded shale mix to fill two troughs. Sand is a very unforgiving medium to plant into, but with careful attention to water, many plants can thrive without organic material.

I also added a few pieces of tufa to this garden from the 2015 NARGS Annual General Meeting in Ann Arbor. These were sited in a bed that receives afternoon shade. In my first experiment with planting directly into the tufa, I used small plants of *Saxifraga paniculata* and *S. cotyledon*. These lasted almost a year but expired in the summer. I have also tried *Draba bertiscea* with similar results. I am eager to try direct planting again with slightly different methods of drilling and backfilling and to attempt direct sowing onto the tufa.

The garden is outfitted with a sprinkler irrigation system, which I use very rarely. Usually, when it's been a few weeks with no rain, I'll run the irrigation and later that day we'll receive an unexpected heavy downpour. Most of my watering is done by hand, sparingly, to establish new plants. Three emitters are sited throughout the garden with the idea that mist nozzles could be added to the irrigation system in the future. Misting seems to be a recipe for disaster, but I did use one of the emitters to create a seep feature in the garden, where water drips out of small tubing snaked in between rocks. I built up around these rocks with the aforementioned sand/expanded shale mixture. So far, I have only planted *Aster diplostephioides* in the flow of the seep, but it has been doing well in its first season.

The Plants

Tucked on the far south end of the Botanical Garden, the Bavarian Garden does not receive a large number of visitors. This is understandable for most of the year, but from April to June the garden is at peak bloom and a delight for an observant visitor. It is a time when I feel very grateful for the chance to grow these plants despite the setbacks that may be looming in the summer.

Outside of spring and fall, there is not much going for these plants. The hot, humid summers take a toll, as well as the torrential rainstorms which are most common in the spring and summer. The garden is in full sun for most of the day, and I'm sure it's one of the hottest places in St. Louis during the summer. Winters, as far as I have experienced, are very variable with occasional subzero (below -18°C) temperatures. There is little persistent snowfall to insulate plants. The soil does not stay frozen which, paired with winter rainfall, can lead to rot.

Due to this climate, I have learned not to take any plant for granted. Those that have survived, even thrived, for a few years can suddenly die off at any time. I continue to try new plants, and the garden fills in a little more each year. I do keep some alpine look-alikes from lower elevations in the garden for their reliability. However it is not all bad news, I have found a number of plants that stand out as tough and dependable. Some alpines do seem to be able to adapt to this climate!

Antennaria carpatica was one of the first plants put into the garden. The four original plants have grown together to form a large mat of silvery foliage. The mat is thick enough to keep out weeds almost entirely. It continues to creep across the coarse gravel mulch each year and puts up small clusters of rosy-pink flowers in early spring. It is easy to divide, and clumps that I transplanted last fall have established well. The first planting is near the top of the garden, but the transplants are lower down near the path, so it seems to be very adaptable to different levels of soil moisture.



Hypericum kazdaghense

Another tough mat-former is *Teucrium montanum*. Though not a true alpine, it must be included because it has done so well in difficult locations in the garden, including hot slopes and flat areas with more moisture. It becomes covered with white flowers in May, with some sparse bloom throughout the summer.

Hypericum kazdaghense has thrived in a fairly flat location along the path. The original five plants have spread into a rectangle roughly 4 feet (4.2 m) wide by 8 feet (2.4 m) long over the past four years! It is not a continuous mat, and there is some dieback and regrowth each year. The yellow flowers in May are held right on top of the foliage.

Petrophytum caespitosum has slowly filled in between rocks with its tight mat of light green foliage. It blooms in late summer, sending up stalks of white flowers. It has a wide range over the western U.S., which I believe leads to the adaptability and durability of this plant.

Globularia cordifolia is another nearly impenetrable mat-former that seems very adaptable. It also transplants well, with divisions from last fall growing on a hot slope. I have both cultivated and wild-sourced plantings in the garden, some in full sun and some in more shade, but haven't seen any of the purple blooms yet.

Asperula nitida subsp. *hirtella* grows well in a trough, blanketing the surface and hanging down off the back edge. Its tiny pink flowers cover the foliage in late spring, with some rebloom in the summer. Troughs have also been good homes for *Alyssum ovirens* and *Alyssum propinquum*. Both have attractive silver foliage and reliable yellow blooms in early spring.

Many iris have taken the conditions of the garden in stride. Currently, there are 15 taxa in the garden, with *Iris pumila* standing out from the rest. I love its dark purple flowers in April. The plants are very vigorous, and I have been able to divide and establish a second planting. Blooming at around the same time are several species of *Pulsatilla*. *P. dahurica* is my most recent addition, producing small purple bell-shaped flowers. A second plant seeded in, artfully tucking itself in front of a rock.

Lastly, I'll mention *Sibbaldiopsis tridentata*. I recently saw it growing in wind-whipped crevices near the coast at the Newfoundland Annual General Meeting. In Missouri, the plants growing in full sun have limped along, but a recent planting in part shade is doing very well and producing runners. I saw a few flowers this year for the first time.

From my experiences, I would like to offer some humble advice to beginning rock gardeners who live in similar climates. Troughs are a great way to start. It allows you to create a small garden with well-drained soil and to be able to site it in the best conditions. You can try a few plants without too much commitment. When you are ready to move into a space in your yard, choose an area that gets afternoon shade if possible. Build up the soil using a well-draining mix and resist the urge to water once your plants have established. Look into local natives that are low-growing and which will be well-adapted to your area. These can be the reliable plants that form the backbone of your garden. In the Bavarian Garden, *Clematis fremontii*, a glade plant from Missouri, Kansas, and Nebraska, fits in well with surrounding plantings and has no issues with our conditions. *Geum triflorum*, which is native across the western and northern U.S. has also worked well in the garden. For more experienced gardeners, don't give up! Try new species from different regions of the world. The NARGS seed exchange is a great place to find this diversity. I hope this article has provided some inspiration for your own garden!



Asperula nitida subsp. *hirtella* (top left), *Iris pumila* (top right), *Geum triflorum* (bottom left), and *Pulsatilla dahurica* (bottom right).

Succulents for Troughs

PANAYOTI KELAIDIS

MOST ROCK GARDENERS seem to design a corner to grow choice alpines in troughs. In the right spot, with the right mix of soil, troughs seem to facilitate growing a wider range of tiny plants and challenging alpines than in the ground. Choice androsaces and drabas will persist for many years in a trough where they disappear in conventional rock gardens. Troughs invariably include a few *Sempervivum* species, which are bona fide alpines after all, and occasionally a species of *Sedum* or *Rhodiola*. Over the long haul, gardens exhibit a sort of Darwinian selection: more and more succulents seem to persist as the more delicate tiny saxifrages and primulas disappear one by one. Why not design a trough just to feature the succulent toughies? Like alpines, most succulents seem to enjoy trough culture as much and more than growing in the ground, and perhaps for similar reasons!

You can control the soil that you put in a trough in ways you can't in the open ground, where worms and all manner of biota are constantly churning the mix. Likewise, the very nature of a trough—a limited volume of soil above the level of the ground—often ensures the superior drainage that both alpine plants and succulents demand. Plants from both high alpine environments and dryland regions often occur on rocky habitats: the confines of a trough mimic the shallow soils and crevice conditions that these plants have adapted to in the wild. In other words, troughs and containers are a sensible choice for many plants.

Troughs with succulents are perfect for people who live in hot summer climates, and with sunny patios where delicate plants can fry. Busy professionals or those who travel a lot or can't always be there during an especially hot spell—when the small soil volume in a trough can dry out quickly. Growing cacti? Not a problem! They seem to thrive on neglect, and even seem to enjoy the soil getting bone dry at times.



Echinocereus fendleri var. *fendleri*
thriving in a trough.

Almost a quarter century ago I was awarded the Francis de Bevoise medal from the Garden Club of America: I was flown to Hawaii for the better part of a week to attend the award ceremony, visiting the islands, hosted by local botanists who toured me around Haleakala and wine and dined me for days on end. A mere thank you note didn't seem quite enough to acknowledge the magnitude of this experience, so I thought perhaps a hypertufa trough planted with sempervivums might better express my gratitude to a friend who went to so much effort on my behalf. In fact, it pleased her so much that she asked for a second trough to frame her patio at the other end. These two troughs have persisted cheerfully for decades with only an occasional splash of watering and deadheading the blooming stalks when they've gone to seed.



A trough full of *Orostachys spinosa*.

Everyone asks about what soil to use for a succulent trough: the answer depends so much on your climate, the site and especially the attentiveness (or not) of the gardener. The wetter the climate, the more scoria, gravel, and sand the better. In hot, dry climates like Denver we find that we can use a heavier mix—even with loam or clay—provided the trough is not level but mounded rather high in the middle to be sure water doesn't pool. It's important not to overwater troughs with heavier soil mixes. Succulents often go semi-dormant in the hotter weather: a wet soil mix at that time can encourage pathogens to proliferate when the succulents are incapable of protecting themselves. Lewisias are especially prone to rot in hot weather if the mix they're growing in is too wet for too long.



Well-placed rocks, elevation within the container, and colorful leaves from *Sedum* 'Cherry tart' make for a winning succulent trough design.

Designing with sempervivums and sedums

Perhaps because they are so accommodating, rock gardeners often don't bother to put as much thought into designing with these as they might. I have found a few tricks that have enormously enhanced plantings we've made with these succulents.

First of all (and above all), build a sizable mound upon which to plant! It seems exaggerated and artificial to stack soil and rocks up almost a foot (30 cm) above the trough rim, but trust me, the soil will compact considerably over a short period. A mounded trough will really look much better, and the plants will perform a lot better in it as well.

Rock placement in a trough is as important as in any rock garden. Some people have the knack, others don't. If you don't have the knack you have two choices: get a friend who's got a good eye to do the design for you—or just find a model garden you admire and copy slavishly.

Make sure you vary the size as well the color of the succulents. Don't use all tiny ones or just large ones—the contrast of size and color will make the garden more appealing all season long.

The prickly choice of cactus

Few plants elicit a greater emotional response in gardeners than cactus. Either you love 'em or hate 'em—but both camps will agree that few floral spectacles on earth can compare with a happy cactus in full bloom. Cactus haters usually concentrate their ire on the genus *Opuntia*,



Escobaria vivipara growing in a container with *Rosularia serpentina*.

which of course are the most abundant and diverse cacti in North America. The spines can elicit some pretty enthusiastic complaints, but it's really the glochids that maximize the irritation—the little bundles of hate that lie at the base of spines, and which seem impossible to remove if you happen to brush near them.

Those of us with advanced phytophilia find it charming that plants which we animals delight in tormenting are witty enough to return the compliment. The real solution to growing most cacti—and opuntia in particular—is to contain them. A cactus elevated in a trough is far less apt to surprise you in the garden when you're weeding. And an elevated platform shows off the wonderful vegetative



Echinocereus coccineus

form and shape that characterizes cacti most of the year when they're not producing miracle flowers. Remember when planting cactus cuttings to allow them several days (or weeks even) to callus over the cut. By the way, when it comes to spines and glochids, real cactus lovers possess a wide array of tongs, hemostats and all manner of other implements, so they're never obligated to touch the objects of their desire. Platonic love is best when it comes to cacti.



Opuntia debreczyi

More than even most alpines, cacti benefit from being planted on raised mounds—even in a trough. Careful rock placement can help make the mound look less artificial, and once the plant is established the effect can be very naturalistic when properly sited.

Which cactus to choose? Of course, this will very much depend on what sort of climate you live in: Southern Californians have literally thousands of species that can be adapted to their gardens, but the colder and wetter the climate, the narrower the range. A handful of mail-order nurseries specialize in hardy cactus and succulents—and these usually highlight the toughest. *Opuntia fragilis* almost makes it to the Arctic Circle—and its nearly spineless (although they have small



Opuntia fragilis



Orostachys chanettii

glochids) cousin *O. debreczyi* is a classic in all climates.

The world of non-cactaceous succulents is quite vast, with whole groups that are actually alpine and moisture loving which do best in cool climates. *Rhodiola* spp., for instance, can grow in or near water, and thrive in frosty regions. *Orostachys* spp. are among the most beautiful succulents for troughs and most of these are maritime in their distribution.

The sea of sedum is so vast that generalizations are in vain. Just be aware that most sedums can spread enough to become minor weeds, so choose with care. I especially like the *Hylotelephium* group, which includes quite a few small sedums as well as the more familiar 'Indian Chief' type monsters. These stay very compact in containers and are constantly morphing through the growing season (although, alas, many are deciduous in winter).

The real champions for us in colder regions are sempervivums. Containers with semps can be moved in humid climates to cooler aspects in summer which can help with their survival, but in much of the USA these are among the easiest of rock garden plants to grow. The trick is to combine them artistically. A well-grown container full of colorful hens-and-chicks can be a centerpiece of any trough collection, and needing almost no care or maintenance for years to boot.

So get yourself some good containers, fill them with a well-drained mix, arrange some rocks artistically and plant away. A minimum of effort at the beginning will result in years of delight and pleasure: how many things in life compare with that?



NARGS in Yunnan

VARIOUS AUTHORS

In June of 2018, NARGS Tours and Adventures went to Yunnan, China. These are some of the impressions and images from the people lucky enough to explore this botanical hot spot. Additional images are included in the online version of the *Quarterly*.

Thoughts on Revisiting China

PANAYOTI KELAIDIS

I FIRST WENT to Yunnan in 1999, as part of a delegation from Denver sent to visit an international floral exposition in our sister city, Kunming. From there we flew to Lijiang in northern Yunnan, landing at their then-new airport for a few days exploration. Flash forward almost twenty years: Kunming, which I recalled as being a rather small city is now bigger than Denver, and the airports there and in Lijiang are brand new yet again—with a flair and architectural style not often seen in this hemisphere. I've read newspapers, magazines, and books that speak of China's rapid change, but it's something else to observe that monumental change first hand.

Fortunately, the mountains are unchanged (if you can overlook the silky smooth new highways weaving through them). Northern Yunnan is a major destination for the exploding Chinese domestic tourist market, but fortunately the droves are mostly concentrated in the cities, or on well-worn destinations in the mountains: the gondola up Shika Shan was packed all day with tourists, but few venture very far from the final platform stops, leaving the entire vast mountain just to us.

I first visited the landscape near Lijiang in late spring, before the monsoons. Driving up to Ganghoba, in the Jade Dragon Mountains, the landscape was carpeted with flowers—mostly anemones in many colors and unbelievable numbers of *Roscoea* flowers, looking for all the world like crocuses in yellow, lavender and purple. It had been very rainy for over a month when we arrived on my second trip: there was vigorous growth everywhere—the anemones were much taller, and the *Roscoea* plants were no longer prostrate but often with stems several inches tall. And this time there were leeches!

Fortunately, when we drove northward to Zhongdian (now Shangrila), the leeches didn't follow, and we were blessed with several weeks of cool, mostly sunny weather. The variety and quantity of floral

Opposite: *Paraquilegia microphylla*. Photo by Yang Adong



Rheum alexandrae in a sea of primroses. Photo by Panayoti Kelaidis.

display in the Three Rivers area of northern Yunnan exceeded my very optimistic expectations. There aren't too many places on the planet you can glimpse lady slipper orchids on the roadside as you drive by (I saw an enormous clump of *Cypripedium flavum* blooming on a cliff as the gondola I was on floated by it in a dream-like state). We almost became blasé about vast fields with thousands of fragrant yellow *Primula sikkimensis* interspersed with purple-pink *P. secundiflora*, punctuated with the huge spires of *Rheum alexandrae*. I was amused on one of the few drizzly days when some participants complained that there wasn't the same variety on the granite soils: only vast acres carpeted with several species of *Cassiope*, rhododendrons and a miniature yellow lily (*Lilium euxanthum*) everywhere, instead of the usual new corydalis, orchid or primrose every few yards.

The cassiope! I've seen them in Alaska, California, the Cascades and the northern Rockies—but never such masses for acres and



Cassiope fastigiata. Photo by Panayoti Kelaidis

acres (maybe I've not been to the right spots in our hemisphere?). And of course you expect to find rhododendrons in China—but it was a surprise to see the variety that occurred above 14,000 feet (4200 m) where winter temperatures must drop well below zero (-18°C) in the winter months. The bright yellow *Rhododendron rupicola* var. *chryseum* and the hot magenta *R. saluenense* spiked to the top of “must have” lists, but the endless permutations of *R. aganniphum* with bold leaves and huge clusters of bloom made me yearn for a little more shade in my garden. Although they didn't have much shade on the peaks!



Meconopsis cf. *henricii* (left) and *Meconopsis integrifolia* (right) Photo by Panayoti Kelaidis

I was expecting a lot of rhododendrons and primulas and wasn't disappointed. But I didn't expect such a variety of anemones or meconopsis. I have spent weeks puzzling over the various floras and websites and am still not confident on many of the names. We saw a dozen or more spring gentians—very few match up with the meager pictures in books, and of course, we don't have the definitive gentian monograph at hand. The half dozen or so androsaces we did find were stars of the trip: *Androsace strigillosa* was found at many of the woodland stops, although the size of stem and the shade of pink varied a lot from one plant to the next. We only found the brilliant crimson *A. bulleyana* on the steppe-like slopes around Napa Hai. I have grown and bloomed this fantastic monocarp a few time and intend to do so with a vengeance again. Fortunately, it's almost always in the NARGS seed exchange.



Androsace bulleyana.
Photo by Yang Adong.

We found dense cushions of *Androsace delavayi* on several mountains—always a stunning bright pink color. *A. yargongensis* was the only small white species. *A. wardii* reminded me somewhat of a miniature form of the strawberry running sorts that go by *A. sarmentosa* or *A. primuloides*. It is sad that none of these are in commerce in the United States.



Androsace delavayi. Photo by Panayoti Kelaidis

The Himalayas generally have far more species than other alpine regions, and it shouldn't have surprised me to find so many drabas and saxifrages. These are common in Europe and the North American mountains, so why not here? Keying out the drabas was not easy, since China has nearly fifty species, and many require siliques (seedpods) for positive identification.

The Porophyllum saxifrages were recognizable, but the variety in the yellow species was a surprise, and finding a diptera type (*Saxifraga ferruginea*) at such high altitudes amazed me!

We seemed to find a chrysosplenium on almost every hike and comparing photographs I now realize there were several species. I am somewhat annoyed that I've seen these wild in Europe, the Altai Mountains of Mongolia and now in China, but have yet to see our native Colorado species that grows not far from Denver.



Chrysosplenium sp. Photo by Panayoti Kelaidis



Thermopsis barbata. Photo by Panayoti Kelaidis

Although the bean family is a major component of the Rocky Mountain flora, I was surprised to see so many species of *Astragalus*, *Hedysarum*, and *Oxytropis* in China as well. The stars of the family here for me were the *Thermopsis* spp.—so much hairier and more compact than in the Rockies, and coming in nearly black as well as yellow colored flowers. *Spongiocarpella* was a new genus for me—yellow again, and a wonderful pinky-purple in *S. purpurea* on Baima Shan pass.

We were extremely fortunate to have had Harry Jans, of the Netherlands, pave the way for this trip: he has led many trips throughout China and felt that the North American Rock Garden Society simply had to have one, too. We were especially lucky to have Carolyn Gao, who runs the company that hosted our trip, along for the ride: she hefted the heaviest camera and seemed to enjoy the mountains as much or more than we did: I have never had such a thoroughly attentive and effective tour manager before on any trip!

China does not disappoint: although the tourism has burgeoned in this region, and the villages have expanded into small cities, there is a lot of local color still here. The hotels that have sprung up are elegant and very comfortable at far more reasonable prices than their European or American equivalents. And every day seemed to be a gourmet feast from breakfast to dinner: Chinese cuisine is truly one of the most varied, and predictably superb.

I was amazed how well over a dozen of us did at over 14,000 foot (4200 m) elevation day after day. Possibly it was the exhilaration of so many fantastic new plants, or the perfect weather or the company, but everyone hung in there. I think most of NARGS membership would do just as well—and should do so soon: With their booming economy and business savvy, I don't think China will remain such a bargain in the decades to come!



Scrub of low rhododendron. Photo by Nancy Doubrava.

Woody Wonders

JEFF WAGNER

The 2018 NARGS trip to Yunnan was taken to introduce participants to its amazing alpine flora. For most NARGS members, species of *Primula*, *Androsace*, *Diapensia*, *Meconopsis*, *Rheum*, *Saussurea*, and others would be at the top of their list. I am certainly drawn to these as well, but long ago, I was captivated by the genera *Rhododendron*, *Betula*, *Sorbus*, *Cotoneaster*, *Acer*, *Abies*, and many others of China's rich woody plant flora. The books, field notes, and illustrations of Wilson, Rock, Meyer, Rehder, Bean, Cox, Wang, Lancaster, and others have always been my revered texts on China's treasure of woody plants.

I hesitated for a long time to take a trip like this. From colleagues and friends who had traveled to China in the 1970s and '80s, I had heard stories of decimated forests, mountain roads jammed with logging trucks, and nothing of the splendor and wonder expressed by earlier plant hunters. And much of what we saw, especially in easily accessed forests, was certainly second and third growth with a very altered understory. Replantings were ubiquitous, haphazard, uncared for, and unnatural.

But the older trees left standing, and those at timberline, along with shrubs, were nonetheless as beautiful and inspiring as anyone might find in the world. The most iconic of China's woody plants occur to the north and east and west of Yunnan which is in a transition zone between the evergreen lowland subtropical forests of Thailand, Laos,

Vietnam, and the highland forests of Myanmar, Bhutan, Tibet, Sichuan, and areas further north. Certainly, seeing the last of the flowering rhododendrons at high elevation was amazing. Venerable large specimens of larch, fir, pine, cypress, cherry, and others looming in the early morning mists was magical. Birch woods on the edge of montane and alpine meadows were beautiful. Seeing caragana in full debonair flower at 15,000 feet (4500 m) along with paraquilegia, potentilla, orchids, primula, and more was surprising. Finding *Pinus armandii* growing in truly xeric conditions along with cacti, cypress, walnut, and others was amazing. It probably has a vibrant future in the urban forests of Colorado's Front Range.

I must not omit that a few of our herbaceous alpinines are in fact woody plants in China, and very attractive ones at that. *Rhodiola* species were the stars of that category. They, along with very tough plants of salix, cotoneaster, rhododendron, cassiope, and more made the woody plant flora of Yunnan a very rewarding and beautiful one well worth more study and exploration.



Rhodiola sp. Photo by Panayoti Keladis.

Yunnan *Corydalis*

CYNDY CROMWELL

There are over 500 species in the complex genus *Corydalis*, more than half of them from China, but for the first several days of our trip, few were to be seen. I had resigned myself to enjoying the orchids, meconopsis, rheum, and even Michael Dodge's lovely willows, until, after a week or so, *Corydalis* Day arrived.

Changes in habitat and altitude yielded a treasure of *Corydalis* species, beginning at Napa Lake. There, the stunning *C. benecincta* lay in an access road, waiting to wow us all, with its brownish, broadleaf foliage and sweet purple inflorescences. *C. hemicentra*, with dull-colored, broad leaves and clear blue flowers, was found by Panayoti several days later, on Baima Shan's western slope.

In between, we saw many yellow-flowered species, including the very showy *C. hamata*, and a sweet *C. cheilanthisifolia*, whose foliage did resemble a cheilanthes fern. Wonderfully blue *C. flexuosa* and *C. pachycentra* were in evidence in many locations, but for me the best blue was the *C. melanochlora* found in the high scree of Baima Shan. Perfect, glaucous foliage and impossibly beautiful flowers made for a heart-stopping moment at over 15,000 feet (4,500 m).



Corydalis benecincta (top left), *C. hemicentra* (top right), *C. hamata* (bottom left), and *C. melanochlora* (bottom right). Photos by Cyndy Cromwell.



The tiny and lovely mat-forming *Primula nanobella*, here on the top of Shika Shan, elevation 14,000. Photo by Matt Mattus.

Primroses of Western China

MATT MATTUS

In northwestern Yunnan, there were a number of plants one could geek-out on: rhododendrons, corydalis, lilies or wild orchids, but it's the primroses that brought me here.

Half of the world's wild primroses come from the vast landscape of the Himalayas. Of the 500 species worldwide, at least 300 of them are found in this mountain range and over a hundred in Yunnan. Fair warning though: the names are still being worked out. I only have a couple of good books to key out what we found, so if you're an expert, feel free to correct me.

We saw *Primula nanobella* on the high mountain tundra found on many mountains from Shangrila, going northwest to the Tibetan border. Growing no higher than 3 inches (7.6 cm) in some places it virtually covered the ground. The tube or 'mouth' is filled with fibers or a pom-pom of tiny lavender hairs which make the center of the flower appear blurry or congested, an interesting feature that liked to freak out my camera as it focused.

The singular flowers of *P. nanobella* arise from the tiniest rosettes, no larger than a thumbnail, and their color was practically a fluorescent violet.

Of all the primula species it is the beautiful, the fragrant, *Primula sikkimensis* that really puts on a show as it often forms great colonies throughout this part of the Himalayas. We found spectacular colonies near streams and seeps throughout our trek. At high elevation, such as

along a stream bed on Hong Shan near 15,000 feet (4,500 m) the colonies stopped us in our tracks. But near alpine lakes, the show often became truly spectacular, with one colony nearly 1/8 mile (0.2 km) long at Tianchi Lake at 12600 feet (3850m). Even trying to capture an image that would show the immense scene was challenging. They were so amazing that I've begun to run out of adjectives.



Primula sikkimensis at Taichi Lake. Photo by Matt Mattus.

Another colony-forming primrose is the pink beauty, *Primula secundiflora*. If only we could grow it here in New England! *Primula secundiflora* is just another one of those Himalayan primroses which most of us could only dream of growing, yet here it grows in abundance, often forming large colonies near streams and wet bogs, deceiving us all with its weedy appearance. Don't taunt us *P. secundiflora*! We came across colonies of *P. secundiflora* everywhere, but mostly between the areas around Zongdian (Shangrila) and Baima Shan. Some of the colonies were massive and everywhere one looked there were thousands of plants.



Primula secundiflora.
Photo by Matt Mattus.

And then we started hitting primula overload. If you garden designers believe that yellow and magenta can't work together, don't tell Mother Nature. Both *Primula secundiflora* and *P. sikkimensis* grew together by the millions on a wide seep at Tianchi Lake which is still at high elevation near 12,500 feet (3800m). In another meadow, we saw three or more species of primroses together, with most of the color in this meadow coming from the pale yellow *P. sikkimensis* and the pink *P. zambalensis*. The colonies of *P. zambalensis*

we found around Dechin and the high passes of Baima Shan were quite variable, with some completely white and others in every shade of violet-pink.

P. szechuanica was the only species we saw in the section *maximowiczii* which typically has species with dark or black flowers. At lower elevations, if one can consider 11,000 feet (3400 m) low, we found *Primula* in the woodlands, like *P. polyneura* on Baima Shan with wiry stems and delicate blooms.

We found primroses at all levels and in every location in northwestern Yunnan, near the Tibetan borderlands. It is truly a primrose-rich area, and a sight few plant people ever get to see as most plant collectors visit in the autumn and not during the bloom season, just after snowmelt in late spring and the Himalayan summer in June and early July.



Primula graminifolia (top left), *P. apoclita* (top right), *P. chionantha* subsp. *sinopurpurea* (bottom left), *Primula zambalensis* (bottom right).

Photos by Matt Mattus.

Salix in Yunnan Province

MICHAEL DODGE

There are approximately 575 species of *Salix* in the world, and China has about 280 of them. There are 105 species in Yunnan Province, so naturally, as a collector of salix (approximately 450 taxa), I was excited by the prospect of seeing many species that were new to me. I was not disappointed. I haven't counted them, but I may have seen 40-50 species in gardens and on the majestic mountain slopes of this area of the Himalayas. There are about 20 dwarf species native to the incredibly steep high mountains of Yunnan, and unlike larger salix, I was surprised to see these dwarfs growing in what appeared to be dry conditions. The only dwarf that I recognized was the beautiful *Salix lindleyana* as I had seen that in the Tromsø Botanic Garden, Norway, last summer; it was common on most of the mountains our amazingly sharp-eyed group visited. This species is offered in the trade in North America but is incorrectly identified. What is sold is actually *Salix hylematica*, also native to the Himalayas, but not Yunnan. I was able to key out another high elevation species as *Salix brachista*. It was somewhat similar to *Salix lindleyana*, but differs in that it has more vigorous creeping growth on the tips of some branches and leaves are often spatulate.



Male form of *Salix brachista* (left) and the glossy leaves of *Salix moupinensis* (right).
Photo by Michael Dodge.

One of the most beautiful willows we saw was *Salix moupinensis*. It is a small tree that has beautiful dark red stems and large shiny reticulate leaves that appear gray from a distance. There were two fabulous shrub willows with new foliage that was bright red; these species were common in their areas, but these individuals were the only ones so colored.

In the cities, the legendary *Salix babylonica* and its curly-stemmed selection 'Tortuosa' were abundant and quite magnificent! There was even an upright form of *S. babylonica*. China has a very strictly enforced "no removal of any plant part out of the country," so I was not able to collect seed or cuttings.

Old Friends

DERRY WATKINS

I signed up for the NARGS trip to China in the hopes of seeing spectacular plants I would never be able to grow in real life. And we did see many spectacular plants – *Rheum nobile*, *Cypripedium tibeticum*, *Paraquilegia microphylla*, etc – but I found what twanged at my heart strings was seeing plants I already grew growing in their native habitat. I fell on my knees in front of *Thalictrum delavayi*. I couldn't stop taking pictures of *Podophyllum hexandrum*, every one with a different pattern of spots.



Flowers of *Thalictrum delavayi* (left) and *Podophyllum hexandrum* (right).
Photo by Derry Watkins.

I became obsessed with *Polygonatum verticillatum* though my iPhone refused to focus on its delicate leaves and stems, much preferring the background plants. Looking so closely I discovered the tip of every leaf twists around trying to grab onto something to climb, but they usually encounter only themselves and end up tenderly holding hands.

I grow several forms of *Polygonatum verticillatum*, but when I got home, I was disappointed to discovered none of mine hold hands.

Brilliantly organized tour, lovely keen people, and amazing plants. Every day was magical.



Polygonatum verticillatum holding hands.
Photo by Derry Watkins.

Cypripedium

LARRY KLOTZ

The following table summarizes our nine sightings of *Cypripedium* spp., comprising six species among three locations. The habitat was always full-to-partial shade in mesic upland woods or thickets. We did not observe the genus in wetlands, open pastures, rock outcrops, or alpine vegetation. The Napahai population of *C. tibeticum* was near the shrine in the Alpine Botanic Garden while the other two species occurred on nearby hillsides. The Tianchi Lake populations were on a wooded slope near the Lake.

	Gangheba	Napahai	Tianchi Lake
<i>C. flavum</i>	x	x	x
<i>C. guttatum</i>			x
<i>C. plectrochilum</i>	x		
<i>C. tibeticum</i>	x	x	
<i>C. yunnanense</i>		x	
<i>C. sp.</i>	x		



Cypripedium flavum (top left), *C. guttatum* (top right),
C. tibeticum (bottom left), *C. yunnanense* (bottom right).

Photos by Larry Klotz.

Opposite: *C. yunnanense*. Photo by Yang Adong



A Botanist's View of Yunnan

LARRY KLOTZ

Our leader and botanical mentor was Panayoti Kelaidis, Senior Curator and Director of Outreach at Denver Botanic Gardens. The twelve participants were Al Gerace, Scott Smith, and Jeff Wagner, also from Colorado; Michael Dodge from Vermont; Matt Mattus from Massachusetts; Terry Humphries from New York; myself (Pennsylvania); Cyndy Cromwell and Nancy Doubrava from North Carolina; Linda Aurichio from California; Derry Watkins from near Bath, U.K.; and Marcela Ferreyra from San Carlos de Bariloche in Patagonia, Argentina. In addition, we were accompanied throughout the entire trip by a marvelous general guide, Carolyn Gao, whose attention to every detail was unflinching; a succession of two knowledgeable local guides, Daniel and Peter, who explained the culture of their respective regions from personal experience; and one or more drivers who were invariably competent, courteous, and punctual.

Our gathering destination was Kunming, the provincial capital of Yunnan. On the official starting date, those of us who had already arrived toured the Kunming Botanical Garden, generously guided by its director, Dr. Sun Weibang. The Garden is extensive, including a rock garden, hardy palms and succulents, several aquatic features, and much more, with frequent labeling throughout. Our tour culminated with the splendid new Conservatory, with its rich naturalistic plantings to simulate desert, rock outcrop, and forest, plus an elaborate system of streams, pools, and high waterfalls.

After one overnight in the Jinjiang Hotel, we began our official trip with a flight northwest from Kunming to the beautiful city of Lijiang. Our first day was mostly cultural, starting with the residence of Joseph Rock, a twentieth-century botanist who also studied the culture of the Naxi, the local ethnic group. Next was the Yufeng Monastery, featuring the 500-year old "Ten Thousand Flower Camellia" (actually two camellias planted together) – unfortunately not in bloom at this time of year. Some of us bought locally grown shelled walnuts from vendors nearby. We then proceeded to the Black Dragon Pool, a small lake with the beautiful Moon-embracing Pavilion; but the famous view of Jade Dragon Snow Mountain was obscured by the rainy weather. In the evening we attended a performance of music and dancing, then strolled in the old town, with its array of touristy shops – including one with carbon-grilled durian. It looked interesting, but none of us had the courage to buy a sample. We stayed at the picturesque Jinfu Hotel for the next two nights.

The second day in Lijiang was an all-day excursion to Ganheba Pass in the Jade Dragon Mountains, our first serious botanizing. The



Paeonia delavayi (left) and an intermittent lake (right) in Ganheba Pass.
Photos by Larry Klotz.

habitats included pasture; pine woodland; and mixed forest with pine, spruce, fir, and evergreen oaks. Limestone was the prevalent bedrock. We hiked to a scenic, shallow, milky blue lake, which, we were told, filled intermittently, sometimes drying to a wet meadow. The weather was continuously dim, misty, and drizzly. Photography was possible most of the time, but I had to dry out my camera that night. This day is also notorious in our memory because we encountered leeches! Some of us had bloody legs and feet – messy to clean up in the hotel room. Only one attached to me – but it was on my neck! However, the floristic richness more than compensated for these inconveniences. I photographed 77 species of vascular plants on this day (not yet all identified), and Panayoti's list includes some that I either missed or did not photograph. Highlights surely include *Arisaema ciliatum*, *Cypripedium flavum*, *C. plectrochilum*, *C. tibeticum*, *Incarvillea mairei*, *Paeonia delavayi*, *Roscoea cautleyoides*, *R. humeana*, *Stellera chamaejasme*, *Thalictrum delavayi*, and others.

The next day our bus drove from Lijiang further northwest to the city of Zhongdian, now also known as Shangrila. En route we did a standard hike along the Tiger Leaping Gorge. The scenery was dramatic, especially the violently rushing water. Although generally dry and rocky, it supported some interesting plants, notably some naturalized cacti as well a large epipetric species of *Selaginella* (*S. tamariscina*) and several small ferns. On the plateau before arriving in Shangrila, we botanized in a roadside pasture and were pleased to view *Thermopsis barbata*, with handsome purple flowers. Our accommodations for the next five nights were at the Shangrila Hilton. We noted the use of *Cedrus deodara* as street trees and the life-size statues of yaks. We spent our first morning in Shangrila viewing the Songzam (Sumtsenling) Monastery, a huge complex. No photography was



Tiger Leaping Gorge (top) and Songzam (Sumtsenling) Monastery (bottom).
Photos by Larry Klotz.

allowed inside, but it would have been difficult to capture the profusion of colorful decorations and furnishings. That afternoon we were free to wander in the old town of Shangrila, with lots of touristy shops much like those of Lijiang.

On our second day in Shangrila we rode a cable car to the alpine



Primula polyneura (bottom left) and *Rhododendron primuliflorum* (bottom right) seen on Shika Shan (top). Photos by Larry Klotz.

zone (above tree line) of Shika Shan (14400 feet, 4400 m), then hiked 4.3 miles (7 km) down a 2100 foot (655 m) elevation change through the alpine mosaic of pasture and rhododendron heath, then conifer-rhododendron forest with wet meadows, and finally valley bottom woodland and pastures. Our floristic inventory was rich thanks to the elevation change and varied topography. My photo collection of nearly 100 vascular plant species from that day includes about ten species of *Primula* and several flowering species of *Rhododendron*. Two of my four recorded species of *Ligularia* formed extensive stands but were solely vegetative. A species with large, orbicular leaves occupied open, wet areas in the forest zone while a species with large, ovate leaves was seen in less wet forest openings and also in the valley bottomland pastures, where it was avoided by the grazing livestock.

Our third day in Shangrila took us to the area called Napahai. The first stop was a meadow and woodland on the Shangrila plateau featuring an extensive display of *Iris bulleyana*, including a few white-flowered plants; some tall, purple-flowered *Aquilegia rockii*; and the glorious pink-flowered lily, *Nomocharis aperta*. We then proceeded to the Napahai Alpine Botanic Garden, which featured a secluded Buddhist shrine; a maze



Nomocharis aperta. Photo by Larry Klotz.

garden of large, raised beds devoted to displays of single species; a terraced nursery; and spacious views of Napahai Lake, the nearby village, and bright yellow fields of rapeseed in flower. At the viewpoint, we enjoyed observing a wedding party of local young couples dressed in gorgeous traditional costumes. Although not intensively maintained, the garden had some botanical signage and interesting plants, such as red-flowered *Androsace bulleyana*; large-flowered *Rosa praelucens*, with petals changing from deep pink to nearly white; and a species of edelweiss, *Leontopodium* cf. *dedekensii*, which reminded us of the Alps of Europe. Our guide Carolyn pleasantly sang for us the edelweiss song from *The Sound of Music*.



Rosa praelucens (left) and *Leontopodium* cf. *dedekensii* (right) at the Napahai Alpine Botanic Garden. Photos by Larry Klotz.



Rhododendron wardii (left) and *Rodgersia aesculifolia* (right). Photos by Larry Klotz.

Our final destination from Shangrila was Tianchi Lake, but with a couple of preliminary stops nearby. A wooded slope yielded *Cypripedium flavum* and *C. guttatum* while a low meadow displayed a vast, magnificent, mixed stand of two tall species of *Primula*: deep pink-flowered *P. secundiflora* and pale yellow-flowered *P. sikkimensis*. At the lake, our group fragmented and dispersed, so we did not all do the same trek. After examining the large-leaved, pale yellow-flowered *Rhododendron wardii*, I crossed low rhododendron heaths to the very wet meadows surrounding the lake (carefully, without going in over my boots!) to view *Rheum alexandrae*, our first rheum, with large, pale, overlapping bracts; plus dense, mixed displays of *Primula secundiflora* and *P. sikkimensis*. Brief roadside stops on our return trip were also rewarding, with sightings of *Iris decora*, *Megacodon stylophorus*, pink-flowered *Rodgersia aesculifolia*, red-flowered female *Schisandra rubriflora*, and distant mountain scenery.

The next morning we departed Shangrila for an area called Hong Shan. We stayed in a rustic guest house with good food (at least to my taste); and botanized around a high-elevation pass (4500 m) for the next four days. The forested slopes around the lodge were a mosaic of dark green conifers, light green deciduous broad-leaved trees, and tawny evergreen oaks. Many of the trees were conspicuously draped with long, pale greenish-yellow skeins of *Usnea longissima*, a fruticose lichen. Our botanizing habitats included woods (or their remnants), rhododendron thickets and heaths; heavily grazed pastures (yaks, cattle, and horses) above and below treeline; and steep shaley or blocky talus slopes. Roadside stops in the lower elevations gave us dark purple *Iris chrysographes*; tall, pink-flowered *Podophyllum hexandrum* subsp. *yunnanense*; and *Arisaema elephas*, the incredible length of its curving, tapering, nearly black spadix far exceeding the white-striped maroon spathe.



Ridge crest on Hong Shan (top, photo by Jeff Wagner), *Lloydia ixiolirioides* (middle left, photo by Linda Aurichio), *Arenaria polytrichoides* (middle right, photo by Jeff Wagner), *Arisaema elephas* (bottom left, photo by Larry Klotz) and *Meconopsis horridula* (bottom right, photo by Larry Klotz).

In the high-elevation talus we saw the drab, hairy rosettes of *Saussurea* and *Soroseris*; and most impressively, the creamy spires of *Rheum nobile*. Alpine habitats also supported cushions of *Androsace delavayi*, *Arenaria polytrichoides*, and *Diapensia purpurea*, as well as the broad rosettes *Lamiophlomis rotata*; narrow-leaved rosettes of petite *Lilium lophophorum*, its oversize flowers with the tepal apices tardily separating; blue-flowered and yellow-flowered species of Himalayan poppy, *Meconopsis*; blue-, yellow-, and violet-flowered species of *Corydalis*, the last being *C. benecincta*, with broad, gray, succulent leaflets that seemed camouflaged against the talus; multiple species of *Pedicularis*, *Rhodiola*, *Salix*, *Sibbaldia*, of course *Primula*; and many more. The topography was steep, the scenery spectacular, and the roads unpaved but well maintained. A few snow patches were still present close to the road, but we did not have a chance to walk on them. Long strands of Buddhist prayer flags adorned the summit of the pass. The air was thin, so breathing was hard while hiking up the strenuous slopes – or even just holding one’s breath while taking a photo!

We returned to Shangrila for one overnight then proceeded north to the city of Deqin, not a tourist town, and located in a drier area of the province, with shrubby vegetation covering the mountain slopes. En route we viewed the Great Bend of the Jinsha (Upper Yangtze) River and spent the next four days exploring Baima Shan pass, with the Deqin Shenchuan Hotel as our lodging. A shrine stands at the top of the pass, with strands of Buddhist prayer flags as at Hongshan.

The first day’s hike crossed a level alpine pasture then ascended the adjoining slopes on a trail through low mixed heath (*Rhododendron* spp., *Cassiope* cf. *pectinata*) and dwarf larch (*Larix*) woodland. The second day was a pasture with some very low rhododendron/cassiope heath. The weather was rainy, and our spirits were a bit soggy as we ate our lunch at in the shelter of a yak herder’s hut then returned to our hotel earlier than usual. The fourth day was also unexceptional: a brief look at blocky sandstone talus and alpine pasture with low shrub thickets of a yellow-flowered rhododendron (cf. *R. rupicola* var. *chryseum*) and juniperus. The third day, however, made this part of the trip worthwhile. The habitats started with a mosaic of alpine pasture and low mixed-species *Rhododendron* heath, with some shrub *Juniperus*; but the climax was a steep talus slope of sharp-edged, blocky limestone with abrupt pinnacles at the summit. Similar pinnacles were visible in the vicinity, and in the distance were snow-covered high mountain ranges. Remarkable species in this rocky habitat included the weird *Saussurea medusa*, cushion-forming *Potentilla biflora*, fruiting *Solms-laubachia* sp., and, best of all, several stunningly beautiful clumps of *Paraquilegia microphylla* in peak bloom. In the habitat overall we recorded two species of *Androsace*, three of *Saxifraga*, six of *Corydalis*

(including yellow, blue, and reddish purple), six in the Fabaceae, six in the Brassicaceae, a white-flowered dandelion (*Taraxacum albidum*), and so on. I photographed 61 species.

The next day, after our brief botanizing at Baima Shan, we returned to Shangrila, stopping again at the Great Bend of the Jinsha River. Our farewell dinner was at Yuan Sheng Tan Jie Tibetan Restaurant in Shangrila; we had eaten dinner there previously on our trip and were glad to return to it. The next morning we flew back to Kunming; and the day after that, four of us went to the World Horticultural Exposition Site, a huge place. We looked at the gardens representing each of the provinces of China.



Shrine and prayer flags on Baima Shan (top left), view from Baima Shan (top right),
Rhododendron rupicola var. *chryseum* (bottom). Photos by Larry Klotz.

Images of Western China

Web-only feature Photos by Yang Adong

The leader of the team of drivers for the NARGS tour of Yunnan was a man named Yang Adong who, in addition to his day job, is an astonishingly talented photographer. Some of his photographs are featured in this issue, including the front and back covers, but there are many more which simply didn't fit within the space requirements of the print issue. I'm thrilled to show some more of his artistic images here.



Top: Yang Adong. Photo by Matt Mattus.
Bottom: Black-necked cranes Napa Lake Shangri-La (Zongdian), Yunnan.



Top: *Rheum nobile*.
Bottom: *Cypripedium margaritaceum* on Yulong Shan in Yunnan.
Opposite: Yunnanese woman in traditional dress.





Top: Field of blooming *Iris chrysographes* and primula.
Bottom: *Meconopsis* cf. *horridula*



Top: *Rhododendron arboretum* blooming on a mountain side in Sichuan.
Bottom: *Saussurea quercifolia* blooming through snow.




Mountain village by day (above) and night (opposite).





Woman with white eared pheasant.

NORTH AMERICAN ROCK GARDEN SOCIETY		
	Bulletin Board	<i>fall</i> 2018
		volume 76 4

Book-of-the-Month Reviewers Needed

Please consider reviewing a book for the Book-of-the-Month feature on the NARGS website. In exchange for your 250-350 word review, you'll receive the book sent to you free of charge to keep. Titles can be newly published books relevant to rock gardeners or older volumes worthy of reconsideration. I can provide a list of suggestions or you can propose a book you'd like to review. Book reviews are located here:

<https://nargs.org/book-of-the-month>

Please contribute to this valuable member resource by contacting Steve Whitesell at elysium214@aol.com.

Upcoming NARGS Meetings for your Calendar

NARGS Study Weekend "Rooted in Diversity"

Hosted by Delaware Valley Chapter

May 3 – 5, 2019

Contact: Jerry Rifkin (jerryr95@comcast.net)

President's Letter

I will say it again: NARGS is the most dynamic plant society around and for \$40 you, too, can have extraordinary experiences, exercise, and eye candy. Plus, our handsome *Rock Garden Quarterly*, which will be offering more very soon.

As I write this in mid-July, Ed and I have just returned from the St. John's NARGS annual meeting. It was amazing, windy-filled with clumps of orchids and meconopsis, views, and fresh seafood. Participants on the sold-out post conference trip have returned. Treat yourself to the photos on Facebook and the NARGS website. We had an excellent turnout and Todd Boland, the chair of the Newfoundland Chapter, is an amazing leader.

I am continuously encouraged by our core membership of 1700 who do come out and support our meetings and trips. No other group offers what we do, especially for the price. However, we have heard you want more local and North American trips that are affordable. They are being planned. But when something unexpected like China is offered, we must jump on it. The raves about China are still coming in.

We saw a preview of Elisabeth Zander's website improvements at the annual meeting in St. John's. You will be very pleased, but it's the tip of the iceberg. High quality digital is coming and thanks to your \$25 donations, we can pay for it. If you haven't sent in your check, please remit soon. (Donate on the NARGS website or mail a check to NARGS, POB 18604, Raleigh, NC 27619-8604.)

My mantra for increasing membership is as follows. Each of our core members of 1700 needs to bring one new member into NARGS by December 31, 2018. It can be a relative, the plumber, postman or supermarket helper. Just bring them to one chapter meeting or no meeting. Give them a brochure and encourage NARGS membership. Offer to defray costs. We need to increase the popularity of NARGS. Bring one new member, each of you. Give a gift subscription. You can make a difference, individual members. Hold a contest, give a plant reward. Think of the possibilities.

We have turned a corner in this organization. I feel the enthusiasm. In this my second year, I want to see more of everything: a larger *Quarterly*, a digital *Quarterly*; overseas and local trips and retreats are more inviting and educational than study weekends. Still two annual meetings are scheduled and we still need more. O, Canada, we are calling on YOU. It was good to see you in St. John's. Old friends. Remember the Guelph meeting!

Always,

Betty Anne Spar

President, North American Rock Garden Society

Patrons

The following recently became NARGS patrons for 2018

LOUISA FERREE (NORTHAMPTON, MASSACHUSETTS)

FRED AND JOAN KNAPP (POMPTON PLAINS, NEW JERSEY)

YOU CAN HELP KEEP NARGS SOLVENT!

Circle of **100** Challenge

Be among the 100 NARGS members willing to give \$300

DONATE AT NARGS.ORG

NARGS 2018 Awards Recipients

Recipients of the 2018 NARGS Awards were announced at the NARGS Annual Meeting in St. John's, Newfoundland, on July 8. The awards were announced by Panayoti Kelaidis, chair of the Awards Committee and by Betty Spar, NARGS president.

Award of Merit for outstanding contributions to rock and alpine gardening: **Bodil Larsen**, Outer Cove, Newfoundland

Edgar T. Wherry Award for outstanding contributions in the dissemination of information about native North American plants: **Todd Boland**, St. John's, Newfoundland

Francis Cabot Award for an outstanding public garden: **Memorial University of Newfoundland Botanical Garden**.

Geoffrey Charlesworth Writing Award for best article in the *Rock Garden Quarterly*: **Ger van den Beuken**, Horst, The Netherlands.

Linc and Timmy Foster Millstream Garden Award for creating a superior garden which reflects the standards of the Millstream Garden: **Elisabeth and Rod Zander**, Goshen, Connecticut

Marcel Le Piniec Award for outstanding contributions to enriching and extending the range of plants available to rock gardeners: **Karen Lehrer** and **Kirk Fieseler**, Laporte Avenue Nursery, Fort Collins, Colorado

Marvin Black Award to a person who excels at promoting the goals of the society: **Anna Leggatt**, East York, Ontario

Norman Singer Endowment grant awarded: **Jason Johns**, PhD student, University of California-Santa Barbara to identify the genes responsible for alpine dwarfism in *Aquilegia jonesii* and genes responsible for growing it.

Norman Singer Endowment grant awarded: **Green Spring Gardens**, Fairfax, Virginia, for renovation of existing rock garden and creation of crevice garden.



Tours and Adventures Committee

The NARGS Tours and Adventures Committee was formed based on discussions during the 2016 Annual Meeting in Colorado with the goal of providing botanically focused tours for NARGS members. The goal of the committee is to provide tours in both North America and overseas that are affordable to NARGS members while providing income that can be used to support other NARGS activities. To date, the committee has coordinated tours to the Big Horn Mountains of Wyoming, the Dolomites of Italy, the Yunnan Province of China, and northern Newfoundland. The tours have generally been 7-14 days in length, have included 10-20 participants, and have been financially successful. Additional tours are planned in 2019 to Scotland and Greece. The Scotland trip is fully booked, but see the Web site for announcement of the Greece tour. Planning is also underway for trips in 2020 to western North America and Argentina

While participants on the tours have enjoyed the tours, we have never asked for input from NARGS members on future destinations and on tour design. This is your opportunity to provide input via a membership survey: https://docs.google.com/forms/d/e/1FAIpQLSfgAnRi_n0ssJo-TbfmfUliOHKvRWYrUil1P99DH0djVigrbA/viewform Your input is important to us. Thanks in advance to all who take the time to respond.

And thanks to former committee members Jody Payne and Lola Horowitz for helping organize the earlier tours.

David White, Michael Guidi, and Mariel Tribby
NARGS Tours and Adventures Committee

NARGS Donations

Donations to NARGS between May 1 and July 27, 2018: \$6,598.

To support Web site improvement, the Rock Garden Quarterly, General Fund, and in memory of Marcia Meigs.

- | | |
|--|---|
| Achterberg, Barbara van
(Connecticut) | Fisher, Richard and Marty (Rhode
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Scott, Caroline (Alberta)	Young, Margaret and Ian (United Kingdom)
Shepard, Cecile (California)	Zoller, Elise (Utah)

**We have learned of the death of the following
NARGS members:**

Ita Kanter, Southwindham, Connecticut

Darcie McKelvey, Caledon, Ontario

Lee Miller, District of Columbia

Glen Alexander Patterson, Vancouver, British Columbia, age 96

Otto R. Rombouts, Seattle, Washington, age 89

SEED EXCHANGE

Yes, it's that time again. This summer seems to have passed even more quickly than last year's, and we should all be sweeping up those seeds, cleaning them, and sending them right now to:

Laura Serowicz
15411 Woodring Street
Livonia, Michigan 48154-3029
U.S.A.

That way, we will be able to partake of a wonderful Seed Exchange in December, and receive extra seeds plus priority (over non-donors) in having our orders filled in January. If you haven't sent your five or more packets of different seeds yet, now is the time! With the deadline for receiving set at **November 1**, U.S. members have another couple of weeks to gather, prepare, and mail their seeds. Canadian and overseas members need to get them into the mails by **October 15**.

If you intend to donate seeds that are late to ripen (e.g., *Rhododendron* and *Arisaema*), you can include their names now in the list that accompanies your other seeds. But be sure to send the late-ripening seeds to Laura by December 1, at the very latest.

And then prepare for the opening of the seedex on December 15.

To place your order for seeds online, you will need to login to the NARGS website with your username or email address and your password. Please make sure you have created an account and know your password now, so that you are ready when the Seed List goes live. You can login at: <https://www.nargs.org/user>.

If you haven't already registered, contact our Executive Secretary, Bobby Ward (nargs@nc.rr.com) so he will have your most current email address; this is how you will be verified as a NARGS member. If you're unsure of the procedure, see the FAQ (Frequently Asked Questions) page for instructions: <https://www.nargs.org/faq-page> .

If you prefer to order by mail, with a printed copy of the seedlist and order form, you will need to send a request by December 1 to:

Joyce Fingerut
537 Taugwonk Road
Stonington, Connecticut 06378-1805
U.S.A.
alpinegarden@comcast.net
860-535-3067

Be sure to include your current mailing address. You must request the list each year; we do not keep a permanent list from year to year.

As the costs of mailing our seeds in protective packaging have substantially risen, we need to keep pace with a slight increase in the prices for the two distributions of seed. The price for the Main Distribution will be \$17 (for both 25 and 35 packets), and seeds in the Surplus Round will cost \$10 per 20 packets.

Two new chapters will be handling the seed distributions for the next two years:

Watnong Chapter, coordinated by Hilary Clayton, for the Main Distribution in January; and

Wisconsin-Illinois Chapter, led by Ed Glover, for the Surplus Distribution in March.

We sincerely thank them for their willingness to sustain this valuable NARGS service.

---Joyce Fingerut, NARGS Seed Exchange Director

CALL FOR NOMINATIONS FOR 2019 NARGS OFFICERS AND DIRECTORS

NOTE: The deadline for nominations is November 1, 2018

The NARGS Nominating Committee announces its call for nominees for the 2019 election of three directors and four officers: President, Vice-president, Recording Secretary, and Treasurer. It is up to all members to consider whom they might nominate. Self-nomination is also acceptable.

Please refer to the By-Laws at nargs.org/laws to read a description of the duties of officers and directors.

PRESIDENT, VICE-PRESIDENT, RECORDING SECRETARY and TREASURER

New candidates for these positions stand for a two-year term (2019-2021)
DIRECTORS (Three)

Directors serve for three years. Every year three new directors are elected as three directors have completed their term. The Directors can be elected for a second three year term.

The mission of the Nominating Committee is to select candidates for the positions of directors and officers who want to serve, have the qualifications to serve, and who fulfil as much as possible the need for geographic diversity between the continuing board members and new members. Geographic diversity can not always be achieved.

We will accept names submitted by any current member of NARGS for these seven positions. The nominee must be a member of NARGS.

Please provide the following information for each nominee:

1. Name, chapter (if applicable) e-mail address, and position for which each person is nominated.
2. Bio of nominee (100 words or less written by nominee)
3. Picture (shoulder length face shot)
4. Note of acceptance from the nominee indicating a willingness to be one of the above officers of NARGS (two-year term) or NARGS Director (three-year term)
5. Your own reason for nominating the person.

Note the bio and the picture will be used for publication in the *Rock Garden Quarterly* if such nominee is on the final slate or subsequently stands from the floor. All the above are for use by the Nominating Committee.

Nominations should be emailed to Marianne Kuchel at mariannekuchel@yahoo.com to be shared with her committee. They can also be posted to Marianne Kuchel, 1815 Blood Brook Rd., Fairlee, VT 05045-9817

Timetable:

The call for Nominations is Stage 1 of the election process outlined below.

STAGE 1: Timetable and call for nominations are published in the Fall 2018 *Quarterly*. Nominations to Nominating Committee by deadline of November 1, 2018

STAGE 2: Nominating Committee agrees on a slate to be published on website on December 31, 2018

STAGE 3: From-the-floor nominations January 1-31, 2019

STAGE 4: Combined list of candidates to be published in Spring 2019 *Quarterly* (deadline February 1 for dispatch late March) and on the website.

STAGE 5: Election online April 16-29, 2019

STAGE 6: Announcement of election results subsequent to ratification at Board Meeting in May 2019.

The Tian Shan and its Flowers
Vojtěch Holubec & David Horák

The Tian Shan and its Flowers
Vojtěch Holubec & David Horák

INCLUDES A DESCRIPTION OF **500** PLANTS, PHOTO GALLERY, AND CHAPTERS ON THE GEOLOGY, CLIMATE, AND VEGETATION OF THE **TIAN SHAN** MOUNTAIN RANGE IN THE BORDERS REGION OF **CHINA, KAZAKHSTAN, KYRGYZSTAN, AND UZBEKISTAN.**

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OR INQUIRE FOR NARGS WEB SITE PAYMENT: NARGS@NC.RR.COM

New Members

*Welcome to all those who joined between
May 1 and July 27, 2018*

Andrew, Judith, 228 Gilmore Rd, Brockport, NY 14420-9312
Boehm, Joreen A, 1334 Southview Ct, Boone, IA 50036-5414
Burke, Joann, 2647 16th Ave, San Francisco, CA 94116-3053
Campbell, C. J., 66 W. Ellsworth Ave, Denver, CO 80223-1622
Cheetham, Zinnia, 300 Longview Rd, Far Hills, NJ 07931-2625
Chipchar, Timothy, 8-3777 Cambie St, Vancouver, BC V5Z 2X4 Canada
Clinton, Bridget, 1924 Tenth Ave, San Francisco, CA 94116-1331
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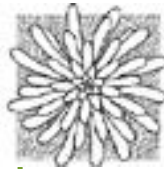
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