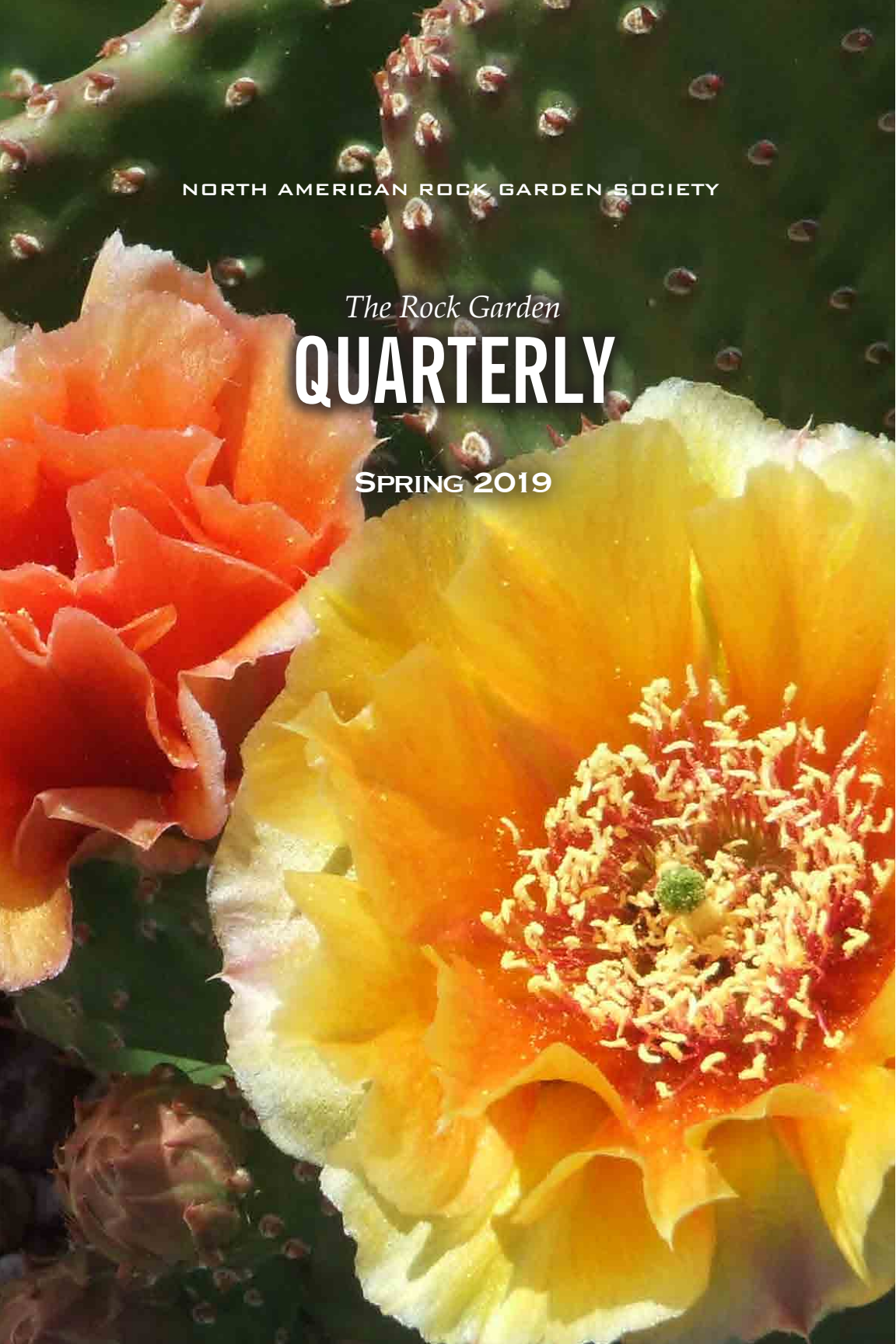
NORTH AMERICAN ROCK GARDEN SOCIETY

The Rock Garden

QUARTERLY

SPRING 2019



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

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Front cover: *Opuntia* Walk in Beauty 'Mandarin Sunrise'

Photo by Kelly Grummons.

The Rock Garden

QUARTERLY

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From the Editor

THE *QUARTERLY* IS going from four print issues to three print issues and one online-only issue. So, sad to say, you won't be getting a print copy of the *Quarterly* in the mailbox this summer. No one is thrilled about this, but like nearly every other plant society, we're facing declining membership along with rising postage and printing costs.

As the editor and long-time fan of the *Quarterly*, I'm determined to do my best to make the annual digital issue of the *Quarterly* exciting and well-worth your membership dues. Because as wonderful as print is, the digital *Quarterly* can do things print never could. I'm working now to arrange our first ever video articles so that you can experience gardens and plants in a whole new way, right from your computer screen. If you'd like to showcase a garden (your own or one in your area), a favorite group of plants, or a local hotspot of native diversity via video, please send me an e-mail (gsparrowgarden@gmail.com) and let's make it happen! I can edit together raw footage from your cell phone along with some descriptions to make a great digital video article for us all to enjoy.

Meanwhile, in this issue, printed on paper, I'm very excited to keep pushing at the boundaries of traditional rock gardening. We have articles on plants for dry shade, growing aroids, and some glamorous opuntias. I've been on the record saying opuntias are jerks, but this article changed my mind. I need a few dozen, immediately.

This issue also features a series of gardens and gardeners from the hot, humid areas. This is not the traditional climate for rock gardening, but these gardeners are growing some spectacular plants in their crevices and bogs. And the new crevice garden at Green Spring Gardens, featured on page 150, was created with a grant from NARGS, your membership dues and donations at work creating beautiful, innovative gardens around North America.

Like these gardeners, the *Quarterly* and NARGS itself is adapting to thrive and create new beauty in changing, sometimes difficult, situations. But sometimes challenges spur the most exciting new ideas, and I'm looking forward to seeing how the *Quarterly* continues to evolve going forward.

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No need to hit the back button when finished reading as the "Other Articles in this Issue" will appear in the right column.

If you wish to read through the whole issue as you would the print version, go to “RGQ” link in Main menu, then click on "Current Issues" in the drop-down menu. Then click on button that says "Download entire issue as PDF" to read the entire RGQ issue as a pdf file on your browser. You can also download it to your computer from the Download icon (looks like a page with a down arrow) or print it out using the Print icon (looks like a printer); both icons are found in the upper right menu within the pdf.

If you wish to read older issues of the *Quarterly*, click on “Old Issues,” where there is also a Cumulative Index, volumes 1 – 71 (Plant index, Subject index, and Author index).

Stunning Winter-Hardy Cactus: The Opuntia

Kelly Grummons

OPUNTIA, COMMONLY KNOWN as prickly pear, is a large genus encompassing many species, most of which are native to the deserts of western North America. We residents of the West often take prickly pears for granted: stepping over and walking around them while hiking, hunting, or sightseeing. They may command a little more respect when a hiker comes across an opuntia in flower. The silky, colorful blossoms are stunning and often trembling with visiting pollinators.

Gradually, opuntias are finding favor in gardens not only in the western United States but also in the Midwest, South, and East. As opuntia is only native in the Americas, they seem very exotic to plant collectors in other continents. There are numerous cactus nurseries in Europe. Demand for nursery-grown and wild-collected cacti and other succulents has escalated due to the fervor created by garden and interior designers who utilize these amazing plants. As water costs sharply increase and our sense of sustainable living and gardening increases, the demand for these low-water plants has exploded. The aesthetic hump of utilizing prickly plants in the garden has diminished. With the trend to urban agriculture, edible varieties of opuntia are becoming popular.

Opposite: *Opuntia* Walk in Beauty™ 'Apricot Glory'
Above: Edible fruit of *O. phaeacantha* 'Paradox Form'

Top: *Opuntia phaeacantha x pinkavae* 'Nambe Sunrise'
Bottom: Opuntia Walk in Beauty™ 'Colorado Sunset'

In our nursery we went from selling a handful of outdoor cactus a year to over 800 #1-sized plants in 2015. We wholesaled more than 3000 #1-size (and larger) cactus plants to other retailers in 2015, and the demand has grown.

The demand for opuntia in the garden market is largely due to their highly ornamental aspects. Many varieties are beautiful structurally, and their flowers are spectacular. Most have significant winter interest. Opuntias offer a low-water substitute for garden flower groups like roses, camellias, and peonies. Now, with selections and hybrids that have few or no spines the nursery offerings of opuntia are more palatable to the average gardener. As happened with roses and other flower groups, cultivar selection among opuntias is growing rapidly. Several Western nurseries offer beautiful varieties both wholesale and retail.

Social media hosts many cactus collector and information groups. Memberships in cactus and succulent clubs and societies have increased dramatically. Online cactus retailers are making it easy for everyone to have cacti in their home and garden. The biggest challenge to the online and conventional retailers and wholesalers is that the plant family Cactaceae is listed in The Convention on International Trade in Endangered Species (CITES), which is an international agreement

A spineless selection, *Opuntia imbricata v. arborescens* 'Inermis'

to protect threatened and endangered species of both flora and fauna. Since the whole Cactaceae family is listed in CITES, it is technically illegal to ship cacti from their native lands to other countries. An update to the agreement recently clarifies that propagules such as stems, pads, tissue cultured plants still in sealed media vessels and certain species can be traded internationally as they do not pose a risk to wild populations.

Author Kelly Grummons.

I still remember the delicate, citrusy fragrance of the opuntia and coryphantha flowers that poked through the buffalo grass at our family's ranch in the Black Hills of South Dakota. I was five or six years old. I was hooked. After decades of overgrazing, the weakened grass gave way to opuntia. Every few years, Dad or Uncle would drag an I-beam or logging chain behind the '53 farm tractor in an effort to eradicate the prickly pests. It was thought this would give the buffalo grass a chance to recover. In reality, we just had too many sheep. Wool was our crop in this dry, dusty land. In mid-March, usually, we'd shear the ewes. We little folks climbed into the enormous burlap sacks hanging from a steel rack and stomped the mixture of oily wool and bloated ticks firmly in the tube until it could hold no more. Our wool didn't bring a high price because it was stained red from the clay soil, as was the truck, the sheets, and Grandma's crystal.

The ground-hugging northern opuntia species *O. polyacantha, O. cymochila*, and *O. fragilis* all sport rather bland yellow flowers in mid-to-late June. Occasionally, I'd come across the scarce *Opuntia macrorhiza* with its tasty red fruit. The fruit, even carefully peeled with a pocket knife always left an annoying glochid in the tip of the tongue, but it was worth it. The little native mice would bypass the sweet red flesh and cache the big, nutritious seeds.

Opuntia heacockiae, named for the opuntia queen Mary Ann Heacock.

In 1986 after graduating from Colorado State University with my degree in horticulture, I was working at a retail nursery in Denver. Before long, I met the Opuntia Queen of the region: Mary Ann Heacock. We traveled the plains and mountains seeking out the region's numerous cactus species. We discovered numerous plants worthy of friendly cultivar names: 'Pawnee's Green Rose', 'Wavy Gravy', 'Peter Pan' and many more. *Opuntia heacockiae* was named after this great prickly pear pioneer.

Top: *Opuntia* 'Peter Pan'
Bottom: A Claude Barr selection, *Opuntia polyacantha v. polyacantha x fragilis* 'Claude Arno'

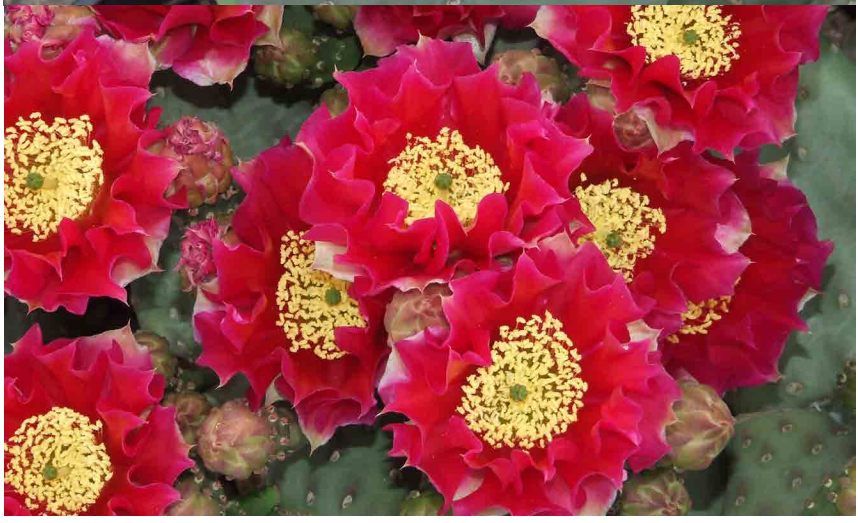
Mary Ann had a significant number of Claude Barr's collection of opuntias. Claude was one of the first horticulturists to focus on the hardy native plants of the northern plains. His opuntias would offer genes of resilience, hardiness, and flower qualities to my later hybrids.

Opuntia 'Dazzler' (*schweriniana* x *basilaris*)

In 2005 I obtained many new species from the Grand Junction, Colorado, cactus garden located at the county extension office. Their curator, cactiphile Don Campbell, was very generous in sharing the clones. By then I had well over one hundred selections of opuntia. The garden hybrid *Opuntia* 'Dazzler' (*O. schweriniana* x *O. basilaris*) introduced by Leo Chance of Colorado Springs, Colorado, inspired me to pursue the possibility of creating hybrids. Recently, amazing hybrids are coming from plantsman Jeff Thompson in Pueblo, Colorado. Many other excellent clonal selections provided pollen for my crosses.

The turning point in my collection (which led to new hybrids) was when I found a humble, small padded *O. aurea* near Silver Reef, Utah. After a few seasons of growing this beauty in the rock garden, I realized it virtually bloomed all summer. I called it 'Golden Carpet'. Hybrids created with this gorgeous plant became what I branded Walk in Beauty™ hybrids. As the collections in cactus nurseries increase, so do the new cultivar selections that are significantly more garden worthy.

Above top: *Opuntia* 'Coombe's Winter Glow'
Above bottom: *Opuntia* x 'Golden Carpet'
Opposite: Selections in the Walk in Beauty™ series (from top to bottom):
'Prairie Fire', 'Ruffled Papaya', and 'Garnet Glow'



Ten Best Plants for Dry Shade

Panayoti Kelaidis

I CAN'T THINK of a rock garden I've visited anywhere that didn't also have a few other garden features as well: a small patch of veggies, containers with annuals, and the inevitable troughs, for instance. Surely every garden has some trees or at least a wall that casts shade. In much of North America, forest is the norm, and gardens in the Midwest or on the coasts are often sited beneath enormous trees. Woodland gardens (and woodland rock gardens) are par for the course in much of America.

I have not kept a systematic tally, but after nearly 40 years of public horticulture, I think that the commonest question I've been asked by garden visitors (eliminating the inevitable "Where is the bathroom?") is "What can I plant in dry shade?" Of course, dry shade in Colorado isn't quite the same as dry shade in Seattle or Florida—if anything our shade is likely to be drier since we live in a semi-arid climate. There are stretches of drought every few decades where our climate can truly be classed as fully "arid" — under 8 inches (20 cm) precipitation a year. Any plant that can survive under that sort of dryness has got to be a toughie!

It seems to me that there's been something of a movement towards more environmentally sound gardening. I've always thought one of the tenets of rock gardens wasn't just to recreate a wild evocative setting, but to try to create gardens that emulate nature—especially local nature—in an urban setting. For some, this means planting only plants that might have occurred naturally in your vicinity, something that I certainly applaud. But for most of us, this means adapting plants from various regions that will grow in your garden conditions with a minimum of effort and supplemental irrigation to produce a maximum of beauty.

This theory gets tested eventually in most gardens when the water system fails on a long vacation or when the gardener who created the garden moves away. Sometimes the new owners demolish what existed before they moved in. More often, the old landscape lingers, gradually morphing into something else (often with a liberal admixture of noxious weeds). Very rarely, a garden is tended thoughtfully by a new owner—but when that happens, something remarkable can occur.

That is exactly what happened at the old Rockmount Nursery in

Opposite: *Corydalis nobilis*

A tapestry of dry-shade survivors at Rockmount Nursery including *Corydalis nobilis* and *Brunnera macrophylla*.

south Boulder, Colorado. This was a flagship nursery for the entire region for much of the first half of the 20th Century: the owner, Darwin Andrews, came to the sunny, dry climate of Colorado from England because of his tuberculosis. This worked for him (he lived to a ripe old age) and the nursery he created lasted until the mid 1950s when half of it was sold to the United States government, creating part of the campus of The National Institute of Standards and Technology which was built on a section of the old nursery (the plantings there, alas, were obliterated). But Andrews' original home and the immediate surroundings of several acres were purchased by a gentleman of German extraction who did something amazing: he left everything exactly as it was, assiduously omitted weeds of any kind and left the ornamentals in the garden to proliferate. And spread they have! Even with Boulder's steppe climate and average of 18 inches (46 cm) annual precipitation, a surprising range of trees, shrubs, and perennials have persisted for over a century—many spreading to make vast colonies. Since much of the property is wooded and has never been watered, this strikes me as a perfect demonstration of what tolerates dry shade! The

plants at the old Rockmount form the core of my suggested taxa below.

Brunnera macrophylla seems to have an extraordinary range of tolerance in gardens. I found this in the wild almost within sight of the Black Sea, but it's called "Siberian forget-me-not" since it does range into very cold parts of Russia. Most woodland gardeners seek out the variegated cultivars, but the old Rockmount nursery only had the traditional green-leaf form. There the original plants have now spread to make wide mats of fuzzy foliage. The heart-shaped leaves make an attractive and dense ground cover. Alas, it's deciduous, but the vigor and utter drought tolerance of this plant make it worthy of inclusion in larger rock gardens. It can overwhelm delicate wildflowers, and so is best planted in difficult shady sites, but in these sites it does the job. The clouds of tiny, aquamarine, forget-me-not flowers last a very long time in the spring and complement companion plantings elegantly.

Clouds of flowering *Brunnera macrophylla* at Rockmount Nursery.

Trachystemon orientalis

I was thrilled to find *Trachystemon orientalis* growing with its cousin, *Brunnera macrophylla*, together in the foothills of the Caucasus in the Adjara region near Batumi last May. Both species were in the last phase of bloom and early seed when we found them. Their foliage is quite similar, but the flowers are utterly distinct. I have not found trachystemon at the old Rockmount Nursery site, but I have a hunch it would give the brunnera a run for its money there. I have a few clumps growing in a dry border at my house, and they have been spreading steadily by the root (brunnera spreads mostly by seed). The vivid-blue, shooting star-like flowers are much larger than brunnera, and are showy in early spring. I look forward anxiously to its reappearance each March.

Scilla siberica

It's not surprising that bulbs are drought tolerant. But *Scilla siberica* is also a shade lover. At the Rockmount site, this has spread with a vigor and abundance that's truly astonishing. I would guess that there are millions of scilla growing at the site. They bloom a few weeks before the brunnera and corydalis that grow with them: I've yet to time a visit at exactly the right time to see the cobalt carpet they must make. This year, come hell or high water, I shall visit at the right time!

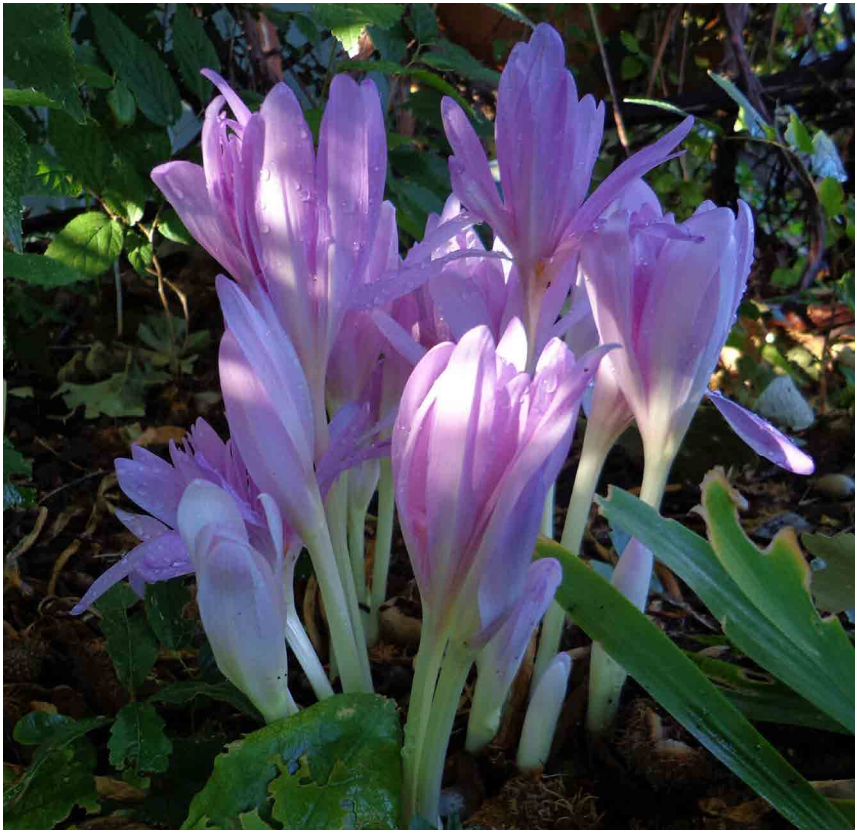
I have not yet found chionodoxa at Rockmount, but bulbs I planted at my parents' home as a child a very long time ago have behaved in a similarly vigorous fashion. I can't gauge if these can take quite the same dense shade that seems to suit the scilla—but they thrive in deciduous shade, and they have taken decades of dryness in that unwatered garden. There are a half dozen or more species whose names have leap-frogged back and forth, so I hesitate to recommend one before the other. They're all pretty vigorous and tough, ridiculously cheap in the fall catalogs, and gorgeous, so it hardly matters which ones you buy. My advice: get them all!

Above: *Corydalis nobilis* flowers
Below: Masses of *Corydalis nobilis* at Rockmount Nursery.

It's intriguing to me that corydalis have become so popular. Dozens of named bulbous kinds are sold at exorbitant prices. And there are the vivid blue Himalayans, that grow so well in cool, maritime climates and struggle for us in summer-hot climates. And then there is *Corydalis nobilis*—not quite bulbous with its swollen taproot, but then not really fibrous rooted like so many species in the genus. I have seen this in the wild on the "Austrian Road" in the Altai Mountains of easternmost Kazakhstan, growing on rocky road cuts with *Bergenia altaica* and

Aquilegia siberica. Growing on subalpine slopes, I never expected them to tolerate drought. But at Rockmount's old nursery there are dozens of luxurious clumps arching so gracefully among the brunnera. It can bloom steadily for nearly two months. I find that this spectacular plant can come to bloom just two years from seed if it is sited in the right spot. It will just keep getting bigger and bigger. This has earned its name of noble. It looks especially well paired with brunnera, which seems to thrive in exactly the same range of conditions and blooms over much the same period throughout April and May.

I suspect that all colchicums possess a good measure of drought tolerance, and they all seem to do best in part shade. I remember watching a colony of these appear every autumn in my neighborhood on the way to school. I never saw the Victorian rockery where they'd been planted watered. There are numerous lusty clumps of colchicum in one shady area of the Rockmount nursery garden where they must have persisted a century so far.



Colchicum autumnale 'Waterlily'

Above: *Hydrophyllum capitatum* (left) and *Hydrophyllum fendleri* (right).
Below: *Tulipa tarda*

Hydrophyllum capitatum and *Hydrophyllum fendleri* grow abundantly across much of North America. Strangely enough, one rarely sees them in gardens despite their ubiquity in nature. We've had a stand appear at Denver Botanic Gardens in an unwatered, native garden. No one seems to have planted them. Perhaps they grew there before the Gardens were built? The bottlebrush flowers (blue in *H. capitatum* and white in *H. fendleri*) make a brief spectacle en mass—and are quite stunning close-up. The splattered, variegated foliage is striking too. By mid-spring, these will have gone to seed and disappeared as quickly as they popped up in March. A friend in Boulder with a large native garden had these proliferate in the last ten years, apparently brought into her garden after the historic 2013 floods. Flood borne perhaps, but they do best in shady spots, with no supplemental water.

Tulips are not the first plant one thinks of when it comes to shade, but several species seem to grow as vigorously in deciduous shade as they do in full sun, and the common *Tulipa tarda* has almost become a pest in some local Colorado rock gardens. My friend Sandy Snyder of Littleton, Colorado, first planted 100 or so in a buffalo grass lawn in 1989 and within a decade they'd self-sown so vigorously that Sandy now mows the seed heads before they ripen. When they're in bloom her buffalo grass is solid yellow in color, but so are the neighboring shady bits. This bulb seems to grow just about anywhere. The bicolored yellow and cream flowers open widely in the daytime, and close at night or in inclement weather. They bloom for weeks in cultivation, tolerating anything our fierce Colorado weather tosses at them! They can go through multiple snowstorms and show no sign of damage. Seedlings that have come up in our shady gardens are as floriferous and vigorous as the ones out in full sun and seem to glow a bit more brightly with a bit of shade.

I recently dug corms of *Cyclamen hederifolium* that had been growing unwatered at my family home for decades. Some were dinner plate size. In case you're curious how long it takes for a cyclamen to make a corm like this, I can shed a little light on the subject. The specimen pictured in this article came from Mrs. Fisher, who had one of the loveliest gardens in Colorado filled with no end of bulbs in spring, and wildflowers

Decades-old *Cyclamen hederifolium*.

like anemones and trilliums. From the time I was eight or ten I'd go to Baseline Road (two blocks south of my house) where she lived and would peer over the wall at her garden. One day she noticed me and invited me in. After that, I'd ring the doorbell at propitious moments in spring and fall, and we'd chat and enjoy her garden together. The years went by, and in my thirties I got a call from her daughters. They said Mrs. Fisher wanted me to dig up whatever plants I wanted when she died. She had passed away, and her family remembered. I dug up five or six of the largest cyclamen in the garden. Mind you this was thirty plus years ago! They could well have been that old already when I dug them. The *Cyclamen hederifolium* in the picture were watered and cared for tenderly by Mrs. Fischer for decades, and got a modicum of care when they were first transplanted. But eventually, my brother-in-law ceased watering the rock garden they were planted in, and they continued to thrive and bloom prolifically. I would guess that these corms are seventy years old at the very least. Now they are finding a new home in my garden in Denver. Cyclamen are the aristocrats of dry shady gardens! No matter how much they spread, you will never have enough (friends are happy to take any excess in any case!).

The classic glory of the genus *Acanthus* hardly needs to be elaborated. Who hasn't admired acanthus that have even naturalized in California and elsewhere? Their naturalizing ways have roused a bit of suspicion among the weed police. Being Greek, I sought these out decades ago and have succeeded with a half dozen species, although *A. mollis* and *A. spinosissimus* needed very careful siting since they're the most tender. There's no question in my mind that *A. balcanicus* is by far the toughest of the genus that goes by so many Latin names (you will also find it as *A. longifolius* and *A. hungaricus*). I do recommend that you plant this where you want it. If you try to move it, the original clump will magically reappear in a few years. It propagates from root cutting, and no matter how deep you dig, it will come back again. It does self-sow with abandon. The solution to this is to cut the flower heads at peak of bloom, suspend them upside down from rafters, and Presto! You have the world's most elegant dried flower arrangement.

Yes, acanthus can spread from seed to the point of being a nuisance. And the scilla and brunnera both have spreading tendencies that raise the hackles of those with trigger fingers on the Roundup or concentrated vinegar bottle. Part of the *modus operandi* of toughies is that they persist and resist elimination. Siting is crucial. I wouldn't be without any of these, but I do have my acanthus in a very tough spot, and I deadhead the seed heads before they explode. Some years I forget, and some seedlings appear which I find easily potted up to share. Not a problem!

Acanthus balcanicus

It is important to distinguish between the truly noxious weeds like garlic mustard (*Alliaria petiolata*), the many invasive honeysuckles (*Lonicera maackii, L. japonica, L. amurensis*), the European buckthorns (*Rhamnus frangula* and *R. cathartica*) that proliferate in dry shade throughout much of America disrupting ecosystems, and these vigorous garden plants. It would not take long to eliminate *Scilla siberica* from a garden or *Tulipa tarda* for that matter, and you would have many enthusiastic takers of those bulbs! Neither are naturalizing garden plants to be considered ruderal weeds, which usually only persist in disturbed habitats. Vigorous garden plants are just that: plants cherished in gardens for their beauty and persistence, and some of which can freely naturalize within reasonable limits. This is part and parcel of their purpose and intent in gardens. To lump our classic garden plants with truly noxious weeds is sloppy at best and at worst an example of the categorical reactionary thinking of extreme environmentalism that ignores the cultural significance of gardening, and consequently insulting the universal human yearning for beauty.

A is for Aroid

Bridget Wosczyna

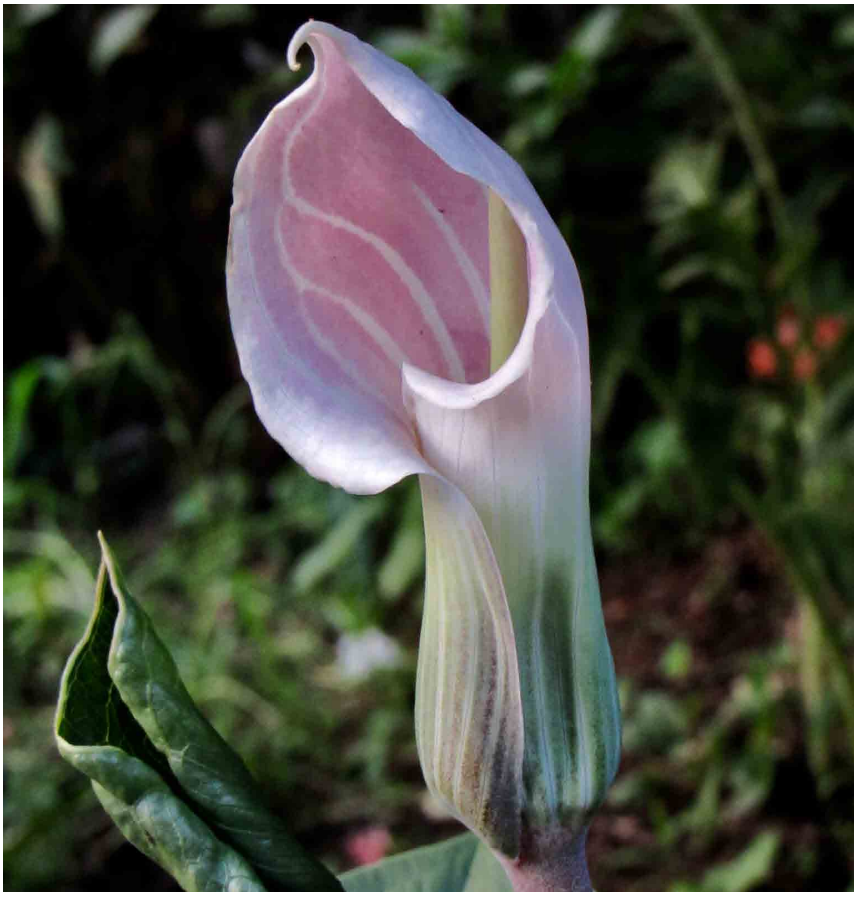
A IS FOR aroid... and *Alocasia*, *Amorphophallus*, *Arisaema*, and *Arum*.

The last genus is the most fitting in regard to the rock garden, of course, but let me start where it began for me: May 2002. I quit my full-time, safe job in the legal department of a now very large real estate concern in southeastern Pennsylvania. I took a job pulling weeds and planting annuals with a woman who had a garden maintenance company. It was in a garden we maintained that I was struck. Anyone who knows me well knows this story. I walked over to a shade bed, and there was the most peculiar flower: *Arisaema triphyllum*, our native jack-in-the-pulpit. You can find them in colonies of hundreds, if you know where to look, in any damp wooded area up and down the East Coast. I still see it, that jack. It was tall, at least 18 inches (45 cm), planted perfectly and shone in the shade; all green and white, no carmine. Nearly everything else just faded for me. You know what I mean. Sure you do. Your kryptonite may be a rare hepatica selection from Japan, or a rheum from Tibet, or something they grow perfectly at the Denver Botanical Gardens but just says "nope" in your garden. But I fell for something local, native, and, heaven forbid, common.

I still have one of the tubers that I collected that year in the woods near where I used to live. I call it my "snarky jack" because it flowers with attitude. I'll get back to that selection in a bit. With time I began to eschew my first love for the sexy foreigners. The progression went: Japan, Himalayas, China (ohhhh, China), and India. I purchased what I could on my meager salary, and it was never enough. If only I had maxed out my credit cards and bought everything I could have from Heronswood, Asiatica and Seneca Hill. They all closed within two years of one another. Happily, all three of the principals of these concerns have moved on and are still forces to be reckoned with in the horticultural world.

The arisaema failures were (and continue to be) legion for me. To this day I cannot grow a *A. griffithii* to save my life. I purchase beautiful tubers and the next year they expire. The humidity here in my summers is tough on some higher-altitude dwellers. But the species I'm successful with are still stunners. From the smallest *A. triphyllum* seedling to the largest *A. tortuosum*, they are fun in the garden and grow happily in pots.

The American native *A. triphyllum* does fine in boggy soils that stay moist through winter. Just about every other species will appreciate



Arisaema candidissimum is sweetly scented to some noses.

being dry all winter, usually under limbed-up evergreens or growing among rhododendrons or daphnes. Sitting in damp soil through the winter is a sure way to lose your non-native arisaema tubers. (There are a few exceptions; *Arisaema ringens* is one that doesn't mind a little moisture.)

A few years ago, a friend in Australia sent me a picture of another strange aroid: *Dracunculus vulgaris*. He grows them to perfection and incredible size. A year or two before that, I was given an *Amorphophallus konjac* tuber, not yet blooming size. These were the slippery slope in my love affair with all things aroid, not just arisaema. The amorphophallus tuber grew to 3 pounds (1.3 kg) and flowered for the first time, in the house, on my birthday a few years ago. My birthday is in mid-March. My poor husband. The flower is terrible to smell for one day and attracts flies which pollinate it. Most of the aroids I grow have foul-smelling flowers.

Arisaema saxatile has pineapple-scented blooms.

There are a few, though, that have a lovely scent along with their beauty. Most people familiar with garden-grown arisaema know *A. candidissimum*. I have had experience with folks who cannot smell the odor even though I absolutely can. *A. saxatile* is also wonderfully scented and reminds me a little bit of pineapple.

Most gravel gardeners are growing plants in sun. Arisaemas are not generally thought of as sun plants, but many species love growing in a half day or more of sun. *Arisaema candidissimum* performs best for me with morning and early afternoon sun. I grow *A. consanguineum* cultivars in full sun, and they thrive. I wouldn't recommend putting them against a wall with a western exposure, but in a good rich soil,

The author's selection of *Arisaema triphyllum*.

they are happy with full sun exposure. *A. fargesii* performs well for me with a couple hours of direct early afternoon sunlight, and the tubers and leaves grow to very large proportions.

But back to my lowly 3phy (my slang name for *Arisaema triphyllum*). My selection was quite fortuitous. I collected some tubers in the woods in 2003, and 15 years later I have a plant that has a super wavy inflorescence and is very tall at 3 feet (0.91 m). The most interesting thing about this mature plant is that it is reliably producing three petioles. I've never seen that in cultivation or the woods. Fortunately, the tuber is stoloniferous, and I'm patiently waiting to see if the offsets will exhibit the same characteristic. The dark petiole is not too uncommon, but very lovely as well.

Cultivation of arisaemas is simple if you follow some rules. Most easily obtained species are hardy to USDA Zones 6-7. They will happily grow for a couple (or several) years in your garden under the right growing conditions, likely increasing. Then, suddenly, you'll notice they didn't come back one year. None of them. What happened? It may have been a nasty winter. They may have succumbed to fusarium (the bane of aroid tubers). Any number of things could happen, but unless you have wild turkeys, it's likely nothing has dug and eaten them because they are toxic due to oxalic acid in the tubers. You should use gloves when handling tubers as they can cause mild skin irritation. And do not rub your eye after handling tubers. Trust me.

There is a way to avoid losing that wonderful patch of arisaema: dig a few up and store in a cold (non-freezing) spot in a paper bag after gently removing the soil from the tuber. There are good reasons to do this: you can see if you have offsets from your original tuber and you can check to see the general health and size of your tuber. I do leave a few of my tubers in the ground over the winter, but I dig up nearly my entire collection each year. Hundreds of tubers which I hand wash, dose with a fungicide and I store in cute little mesh bags in vermiculite in the spare refrigerator in my basement. Obviously, this would not work for the average gardener just wanting a few jacks in his garden. I am extreme in this endeavor and will likely begin growing my collection mostly in pots soon. It's a lot of work each spring and autumn with the number of tubers I have. Why do I do it? I'm a little over the

Digging tubers annually allows these *Arisaema fargesii* tubers to grow extremely large.

top, for sure. But I like to see what I've got: I share some, I trade some, I sell some. And then I start bragging about size.

My *Arisaema fargesii* pictured here is very large. You won't often see tubers this size. There's a reason for this; when the tubers get very large they are also very susceptible to rotting over the winter. This species is an amazing offsetter so you mightn't notice that there was a problem out in the open garden as you would have juveniles coming up. But the way to get heft and continue to grow this size tuber is to lift it each winter. I make sure there is no insect damage, collect the offsets, and then I brag about the size of the tuber to my friends. (It's the little things. I kill hardy cyclamen every year. I need to have something to natter on about.)

The species of aroids I would suggest for those interested in growing a few would be the following, suitable for growing in Zones 6-9:

Arisaema fargesii - Fantastic when mature with a huge trifoliate leaf.

Arisaema candidissium - Highly desirable and spreads quickly by offsets. You can have a dozen in a couple years, no problem.

Zantedeschia aethiopica - A hardy calla lily that is super pretty mixed among your borders. The large leaves have a hosta-like feel, and the familiar white flowers are lovely and last a couple of weeks at least. I would recommend *Zantedeschia aethiopica* 'Green Goddess' but she should be lifted to assure her survival as she is not as hardy as the straight species, which should be planted in a protected spot as to not receive the harshest of winter.

Amorphophallus konjac - Hardy to at least Zone 6 and perhaps colder if planted very deep.

Sauromatum giganteum - Super hardy and very odoriferous in flower. This plant is not for the faint-hearted. The stench this little beauty produces can easily be smelled for a day or two from fifty paces. But the inflorescence is gorgeous and looks like velvet. Upon maturity, the leaf will not get very tall, but it will be long, nearly 2 feet (60 cm).

It began for me with a little native and has moved me to explore so many avenues. My friend in Australia introduced me to other small aroids and encouraged (and enabled) my journey with those that I will not garden without. The branches eventually led me to the rock garden: arums, biarums, and myriad other lovelies that thrill each year. Find your own path, but do make room for the aroid family.

Changing Perceptions of Southern Rock Gardens: Experiences at Peckerwood Garden

Adam Black

WHEN I MENTION rock gardens to casual gardeners here in Texas, the response is always "Oh, I love cacti and agaves." When I then try to explain how I aim to mimic the overall look of a northern rock garden, with a variety of miniature, compact perennials, dwarf shrubs, and other small plants with the growth habit of alpine plants, there is then the knee-jerk reaction that those plants will never take the Texas heat. If I try to detail further how there are so many small plants native to Texas, the South, and from other hot, humid climates of the world which, when properly planted among well-positioned rocks, can create the same effect, I usually have totally lost them. To most people, a rock garden in the South only means xeric, succulent plants and can be nothing more.

Top: Peckerwood's first rock garden, featuring *Dicentra eximia* 'Dolly Sods' in the foreground

The Mexican cycad *Dioon angustifolium* with various agave and cactus species.

Before I moved to Texas to assume the role of director of horticulture at the amazing Peckerwood Garden just northwest of Houston, Texas, I gardened in a similar Zone 8b climate of north Florida. The few southern rock gardens I was exposed to in my travels that influenced me were still rather northern, in no less than zone 7b. I enjoyed Atlanta Botanical Garden's rock garden; but most initially captivating for me was Tony Avent's first scree garden next to his original house at Juniper Level Botanic Garden. Among the many intriguing plants I had never seen before were things that I had already grown successfully in Florida but were better displayed in this situation. Soon, the JC Raulston Arboretum installed their scree garden, while more extensive scree trial gardens sprang up at Juniper Level Botanic Garden. Some of the plants used were even favorites native to the Florida sandhill scrub floral communities of my southerly stomping grounds, including *Conradina* spp. and other scrub mints, *Amsonia ciliata, Liatris* spp., and *Spigelia gentianoides*. I, therefore, surmised that similar gardens could be created in Zones 8-9 in the coastal plain with proper plant selection.

Beyond the obscure genera I tend to grow, I soon learned from a few small experimental rockeries, crevice gardens, and scree gardens around my Florida property that I was having great success with culinary herbs that were considered difficult to impossible in the area's wet summers, including lavender, creeping thyme, and other species of Mediterranean origin. This prompted me to try other ornamental plants from summer-

dry climates and further inspired Jonathan Lubar to install a small scree mound in the bulb garden he maintained when he volunteered at Kanapaha Botanical Gardens in Gainesville, Florida. This resulted in surprising successes with some South African geophytes as well as long term success with *Delosperma cooperi*, which is readily available in the region yet typically dies quickly in the average garden.

It quickly became apparent that the type of gravel used made all the difference for many plants, especially those from areas that didn't naturally experience as much summer rain and ambient humidity as they were subjected to in the southeast. Gardeners in north Florida, the Gulf Coast of Texas, and points between tend to gravitate towards the readily available "pea gravel" or "Chattahoochee gravel" for their cactus and succulent gardens, which is available in several grades and is composed of round, river-polished quartzite in mixed hues of brown, copper, orange, and white. I had always observed that this glassy-textured gravel kept conditions far too wet where the gravel and underlying soil interfaced. I believe this contributed to an unwanted humid microclimate around the plant, rather than the desired reflected heat which would help bake the foliage dry when the sun came back out after a summer thunderstorm and extinguish any humid conditions trapped in the dense crown of the ground-hugging shrubs.

Besides the negative effects of pea gravel, I never liked the appearance of it in a rock garden. Instead, I wanted to mimic the erosional features I saw in the mountains – irregular, jagged chunks of rocky scree, as opposed to consistently rounded pebbles. Though the scree gardens in North Carolina used expanded shale, this was difficult to find in Florida. The gray granite gravel we had available there offered a similar look but was quite heavy and expensive to import from northern Georgia. I lucked out with one supplier offering a load of half-inch (1.27 cm) granite for a tremendous discount as it had been minimally "contaminated" with other nearby piles of contrasting types of gravel, an effect that I found to appear even more natural. Furthermore, it reflected heat well, and the generally flat granite chips formed somewhat of a shingling crust that repelled the penetration of excess water. It allowed the root systems to stay cool and adequately moist in summer, yet not excessively wet and cold as a layer of pea gravel unfortunately would. I was pleased to learn when I moved to Texas that expanded shale is readily available here, much cheaper than granite, and providing the same aforementioned benefits that the granite gravel had produced, while also being lighter.

Opposite: A new species of *Conradina* from the sandhills of northern Florida excels in scree gardens.

Peckerwood Garden is a remarkable public garden that began as the private collection of artist and plant explorer John Fairey. Together with Carl Schoenfeld, they co-founded the famous Yucca Do Nursery which operated for many years next door to Peckerwood as an outlet for the diversity of exciting plants they were collecting during their 100+ trips to the dry deserts and lush montane forests of northeastern Mexico. Yucca Do moved to another location a number of years ago and, sadly, closed recently. Our non-profit foundation now owns John's original garden plus the adjacent site of the original nursery for the garden to gradually expand into. In rehabilitating the old nursery side of the grounds, we found a bed with perfect topography and spare rocks to modify into a small trial rockery, combining the conditions of a traditional rock garden with scree and crevice garden features.

Those who have visited Peckerwood Garden are struck by John Fairey's award-winning landscape design that utilizes plants so unfamiliar to the region, or to any garden worldwide. The garden push the limits further with a great juxtaposition of xeric gardens transitioning into contrasting woodland assemblages using floral textures to their greatest advantage. The dry gardens, essentially scree gardens due to their topography and gravel mulch, are where John features his many important wild collections of agaves, yuccas, and other woody lilies along with xeric trees, palms, and other complementary, exciting plants from around the world. In addition to

Above: *Agave* 'Mr. Ripple', a favorite collected by John Fairey and Carl Schoenfeld.
Opposite Top: Glowing autumn foliage on *Prunus mume* adjacent to *Dasylirion*, *Dioon*, and other xeric plants exemplifies the juxtapositions of John Fairey's design.
Opposite Middle: Among John Fairey's signature designs are expansive gravel pathways tying together the xeric plantings in the rear with the shady woodland.
Opposite Bottom: Light factors heavily in Peckerwood's design, with low evening sun casting dramatic amber glow and dark shadows.

architectural macroflora, the signature feature of these dry gardens is pea gravel. Despite my thoughts about pea gravel, I mean this in no way to be a criticism of John's choice. The gravel harmoniously defines the magic of his landscapes so well, perfectly creating the impact John so effectively set out to make. Combined with the topography modified for drainage, it is of no detriment to the plants he has chosen. He is not trying to grow the species I was aiming to grow, and the entire visual effect is remarkably striking.

Linaria vulgaris f. *peloria* seems amazingly adaptable to the hot Texas sun.

Peckerwood's mission includes continued growth of our collections for plants of conservation importance, as well as seeking new, adaptable plants that can diversify area landscapes should they survive our trials in the harsh extremes they face in Texas. I view the rockery I set up near Peckerwood's office as a way to broaden visitors' minds to gardening tactics and plant palettes that southern gardeners can utilize for diversity and satisfaction. It is effectively building upon the impactful results of John's creation, and with our expanding educational mission, offering tremendous value.

It has been almost three years since our trial rock garden was installed using warm-climate analogs that grow in clumps, cushions or are otherwise small-statured, alpine-esque species that would be lost in a typical garden bed. I intentionally made sure to exclude the predictable cacti, agaves, and other species expected of a Texas rock garden, and otherwise featured so well in John's dry gardens. Included are things that I already knew would prosper, while also trialing many species for the first time. As far as failures, some were surprising, and some were not. We did trial some interesting things donated by other gardens and collectors that originated from higher, cooler elevations that I was skeptical would survive our hot summers, and in most cases, they didn't. Other things I feel do stand a chance here based on their

natural tolerance to heat and cold may have perished due to other reasons. These will be trialed again if the opportunity arises.

I have been amazed at a selection of fringed bleeding heart, *Dicentra eximia* 'Dolly Sods' that comes from the shale barrens of West Virginia and is offered by Plant Delights Nursery. In near-full sun it held luxurious lacy blue-green foliage and was blooming non-stop from spring through at least early August, at which point it abruptly died back. Poking around underground, it appears to have died outright rather than simply going dormant. Having lasted so long into the summer in such wonderful shape, I don't think this was simply a heat-related issue, so this will be one we definitely will try again.

Though it hasn't flowered yet, *Achillea sibirica* subsp. *camtschatica* has been quite a surprise. The species and varietal name clearly convey its frigid origins of the Kamchatka Peninsula of eastern Siberia, the same latitude as Alaska. The foliage is quite attractive, in no way resembling the more commonly known yarrow, *Achillea millifolium*. Another surprise from temperate Europe that hasn't flinched over the summer is the pasque flower *Pulsatilla vulgaris* subsp. *bogenhardiana*. It will be even more exciting if it actually flowers this spring. As with a number of cautiously trialed plants, I do have this one situated on the north side of a strategically positioned rock where it stays slightly less scorching hot than it would experience in direct sun. Another European that seems quite unexpectedly tolerant of full sun and hot temperatures is *Linaria vulgaris* f. *peloria*.

Surprising not for its tolerance to our region but instead due to its foliar beauty is *Hypericum geminiflorum* var. *simplicistylum*, a Taiwanese St. John's-wort donated by its collector, Mark Weathington of the JC Raulston Arboretum. The oval leaves emerge red, transitioning to purple and then to dusty blue, all bundled in a neat, compact clump. With the foothold it's gotten over the last half of the year, it will surely embellish its beauty next year with showy yellow flowers typical of the genus. There is a whole world of interesting hypericum species, native and exotic, waiting to be better utilized for their ornamental potential, many of which fit in perfectly to a rock garden.

Other dwarf woody plants include my miniature compact selection of the Florida Sand Pine (*Pinus clausa*), grown from seed collected from a witch's broom. The interesting prostrate mat of *Dalea capitata* 'Sierra Gold', a Mountain States Nursery introduction, forms a soft-textured groundcover with gold flowers in late summer and looks especially attractive flowing between and spilling over strategically positioned rocks.

Several geophytes are doing well in the rock garden. From Argentina, *Nothoscordum sellowianum* is a favorite winter highlight, forming a dense patch of short thin leaves that more resembles a clump

A *Pinus clausa* broom seedling glowing in the late evening light.

of dark green moss. When it flowers, the green is almost completely obscured by a mass of dark yellow flowers resembling miniature crocuses. Though in quite a different situation than naturally found, two species of trout lilies, my Florida panhandle collection of *Erythronium umbilicatum* and my east Texas collection of *E. rostratum*, are flourishing so far. Typically found in forest understory, they would otherwise get overlooked in our woodland garden while here they can be better showcased in their own pockets among taller, shading rocks.

Among some interesting Mediterranean plants doing well are several germander species, most showy being two ashy-white fuzzy species, *Teucrium polium* and *T. gnaphalodes*, both donated by Denver Botanic Gardens. I'm excited that two species of *Globularia* (aka globe daisies) have established well and are starting to form mats of rosettes composed of delicate spoon-shaped leaves. It will be nice if they produce their vivid blue flowers next year. Dwarf cranesbill (*Erodium* x *variable* 'Bishop's Form') developed a very neat, tidy mound and produced its delicate pink flowers, making me want to track down the two parent species of this hybrid.

Losses among Mediterranean plants include several *Veronica* species, and most disappointing were *Draba hispanica* and *Plocama calabrica*, two that I was enamored with in Denver Botanic Gardens' collections and optimistic they would survive if sited properly based on their natural conditions. I am not giving up on these yet! Speaking of Denver Botanic Gardens, their exceptional rock garden has been a tremendous inspiration and got me addicted to the genus *Eriogonum*. We are growing a few Texas natives well, including the silvery

Eriogonum tenellum, but I hope to find some of the alluring species from further west that will adapt to our conditions.

I have long been fascinated by xeric ferns and selaginellas, and have been building up a collection of our native Texas and southwestern *Cheilanthes, Pellaea, Astrolepis*, and others, along with the mat-forming *Selaginella* species that look amazing as a backdrop for more structurally interesting plants. Unrelated but also from the southwest, Arizona to be exact, is a dwarf pipevine, *Aristolochia watsonii*, with its low carpet of elongated purple leaves veined with chartreuse patterning. Another small-statured relative from Europe, *Aristolochia sempervirens*, has made a tidy, compact evergreen mound of emerald leaves occasionally punctuated by its otherworldly flowers. When either species is in bloom, we have observers on their knees, both begging us to share, as well as simply to get close enough to best appreciate their alien form!

Aristolochia sempervirens was a surprising success

Plenty of southeastern native plants have requirements and appearances that lend themselves well to this style of rock garden. Among those from the Southeast doing well are various forms of *Viola pedata* (bird's foot violet) along with various species of phlox, penstemon, scutellaria, baptisia, and silene. The dwarf shining blueberry (*Vaccinium myrsinites*) from Florida produced a few fruits, and many other denizens of the southeast's sandhill scrub habitats offer tremendous potential. Two Florida native members of the aster family that I am very fond of are *Garberia heterophylla* and *Chrysoma pauciflosculosa*, which are slated to be planted shortly.

This article just scratches the surface of the interesting plants we are trialing in these growing conditions, and there are many additional options I am eager to try. I hope this style of gardening will encourage others in the southern United States to experiment with rockeries for aesthetic enjoyment, even if they choose to include cacti and agaves.

Urbanite Outfitters: Two Years Addicted to Crevice Gardening

Jeremy Schmidt

STARTING WITH AN idea and a pile of broken concrete, the Urbanite Outfitters Crevice Garden project now snakes its way prominently through Juniper Level Botanic Garden in Raleigh, North Carolina, where it continues to grow and thrive. Tony Avent, (owner of Plant Delights Nursery, Inc. @Juniper Level Botanic Gardens), first conceptualized a crevice garden based on the success of a Kenton Seth installation at the JC Raulston Arboretum in 2014. Subsequently, a 2015 JLBG demolition project produced 70 cubic yards (53 cubic m) of broken concrete slabs—a cost-effective and repurposed material for building crevices. Crevice construction began in January 2017 and has grown to include more than 100 tons of hand-stacked, locally-quarried, "urbanite" slabs. JLBG has spent the last two years addicted to crevice gardening and there's no turning back now! Here's what we've learned, what we've grown, what we've killed, and what's next.

Our botanical goal is primarily to establish new benchmarks of success in growing plants from xerophytic climates, including South America, the Middle East, and southern Europe, in our hot, humid, rainy climate. We expected that a coarse, stone-based soil would reduce the foliar disease pressure on pubescent-leaved plants, and provide the ultra-sharp drainage necessary to accomplish our goal. As the size of the crevice garden increased, the project scope and plant selections have diversified to include crevices for calciphiles and wetland plants. Thus, we amended some sections to accommodate a broader array of plant types. On the dry side, we've added organic matter to some crevices to include plants needing fertile soil while retaining sharp drainage. On the wet side, we have installed several dripping seeps that create exciting planting opportunities across a wet-to-dry crevice gradient. And on the wild side, we filled some crevices solely with straight-off-the-shelf bags of dolomitic lime.

Now let's talk plants! In just over one year, we've planted more than 1,200 taxa into the urbanite crevices. As of October 2018, we are watching more than 870 living taxa, 340 of which have now survived over one year. Here are some of our favorite surprises thriving today across JLBG's diverse and expansive crevices.

Opposite: A section of the crevice garden photographed in 2018.

Part of the crevice garden from above.

Dry Crevices:

Structurally coarse and deficient in organic matter, traditional dry crevice garden "soil" provides a unique opportunity to trial and display thousands of plant taxa that will not survive in JLBG's nutritious, humus-rich, irrigated garden soil.

Our original dry crevice garden soil mix is as follows:

- 8 parts Permatill™ (sterile/inert, 8.0 pH, CEC>20)
- 1 part gravel (#57 stone)
- 1/8 part native coastal plain sand (3.5 pH, phosphorous index >100)
- 1/8 part Raleigh red clay (5.0 pH, potassium index >100)
- Trace part organic matter (<1%)

Two years after the first crevices were populated, we've been amazed at how rapidly and deeply plants have rooted and grown in our dry, coarse mix.

Teucrium polium subsp. *aureum* 'Mrs. Milstead' (left) and *Teucrium cossonii* (right)

Most pubescent teucrium melt in Raleigh's wet summer heat. *Teucrium polium* ssp. *aureum* 'Mrs. Milstead' has thrived in our urbanite crevices. Its silvery foliage and bright yellow flowerheads are a delight. Its cousin, *Teucrium cossonii*, survives in compost-based garden soil, but seems even more vigorous in dry gravel. We've enjoyed watching *T. cossonii* criss-cross its way over crevices.

Many European silene species dislike our sweltering Piedmont summers. *Silene uniflora* 'Compacta' has performed stunningly, however, forming silvery green mounds with large white flowers with inflated calyces. It is self-sowing gracefully into nearby crevices

Penstemon baccharifolius from the NARGS seed exchange has performed extremely well for us. The specimens are topped in summer with groups of tubular red flowers above a mostly shrubby evergreen clump. We have killed it with compost to the point of despair several times, so we are thrilled to see it thriving in the crevices.

Top: *Penstemon baccharifolius*
Bottom left: *Silene uniflora* 'Compacta'
Bottom right: *Oxalis squamata*

We are pleasantly surprised to have had success with a medium-high altitude Chilean Andes native. We did not expect *Oxalis squamata*, from Denver Botanic Gardens, to power through a hot, wet Piedmont summer.

A Dan Hinkley collection of *Globularia trichosantha* has proven to be a Turkish delight, forming green cushions in the crevices.

Planted into the dry crevices from a tiny 2 inch (5 cm) pot in 2017, *Daphne* x *napolitana* 'Meon' has captivated us. It's now a 15 x 15 inch (38 x 38 cm) evergreen shrub! Most daphnes die rapidly in our climate in central North Carolina and other daphne taxa wish they had died sooner. We feel this vigorous, free-blooming success is a game changer.

Although the sea level native *Crambe maritima* is no stranger to heat and humidity, the corrugated silver leafed rosettes of this cabbage cousin languished and melted away again and again in compost based soil. After so many failed attempts to grow this plant, we did not set our hopes high. But crambe is just so darn pretty…why not re-re-re-re-try this plant? Urbanite crevices and Permatill™ based soil… success at last!

Left: *Daphne* x *napolitana* 'Meon'
Right: *Crambe maritima*

Dry Fertile Crevices:

Being careful to retain sharp drainage, we added organic matter and native soil to several crevices to grow xerophytes in the same crevices as plants suitable for compost-based garden soil. The amended fertile dry crevice garden is as follows:

- 1 part Permatill™ (sterile/inert, 8.0 pH, CEC>20)
- 1 part organic matter
- 1 part native sand/clay mix

Cool autumn nights have awaken the solanaceous summer sleeper, *Mandragora autumnalis*, from its crevice cove. It came into bloom in early October. Apparently our urbanite was suitable for sleeping through months of hot nights.

Acinos alpinus, from Jelitto Seeds, stood the test of summer heat and sailed through the relentless rains of Hurricane Florence. This tiny-leaved European mint now stylishly cascades down the slope, softening the edges of the crevice quite nicely.

A Texas selection of a fern's first cousin, *Selaginella wrightii*, passed through summer unscathed, developing into a beautiful evergreen groundcover between steeply sloped, east-facing concrete slabs.

Left: *Acinos alpina*
Right: *Selaginella wrightii*

Wet Calcium Seeps:

To contrast the dry, non-irrigated crevices, we have installed seeps to mimic unique naturally wet areas home to diverse, rare, and highly specialized taxa. We used a Permatill™/ compost/soil mix that we estimate will remain on the alkaline side. In addition to an aesthetic benefit, our small alkaline seep has provided excitement and new perspectives.

Trautvetteria nervata

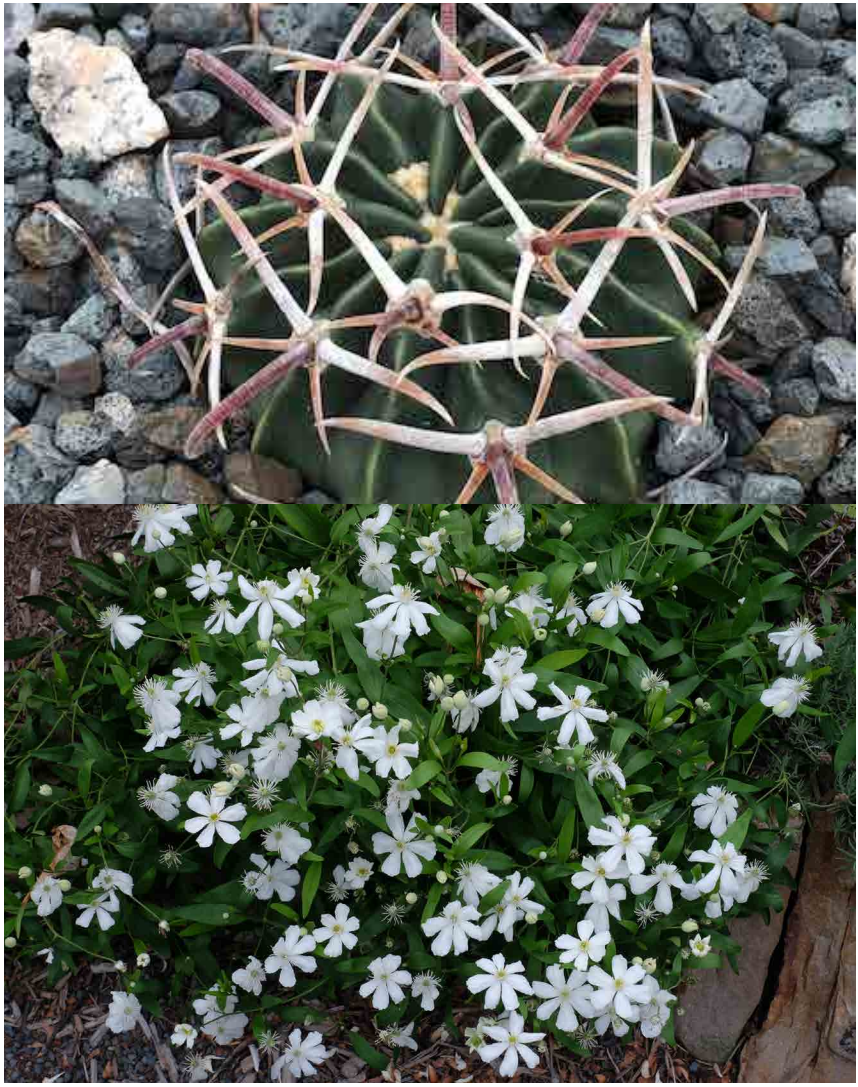
At the base of a seep, *Trautvetteria nervata*, a 2017 rescue from near Augusta, Georgia, has exploded into a real show-stopper. Chalk this one up to "you never know unless you try." This just-in-time collection looks far better growing in the crevice garden's wet alkaline seeps than when we came upon it in a now clear-cut cypress/gum swamp. We had no idea this uncommon, uncultivated species would command such garden presence. From June to October, large corymbs of white powderpuff flowers rise prominently above the amazing dissected foliage.

Dolomitic Limestone Crevices:

In another demonstration of "you don't know unless you try," we've filled a crevice section with pulverized dolomitic lime right out of the bag and incorporated taxa native to dolomitic situations. We tested a sample of our store-bought dolomitic lime to see exactly what it was made of. Of course our general assumption was a very high pH… perhaps >9.0 pH. Wrong! Here is what we found:

- pH: 7.3
- Ca:Mg: ~1:1
- S index: ~7000
- CEC: 34

We would never have guessed that the pH was so low! A sulfur content about 70 times what we find in our native JLBG soils would logically adjust the pH down. Although several accessions have died, others thrive when planted in this section.



Top: *Echinocactus texensis*
Bottom: *Clematis hexapetala* 'Mongolian Snowflakes'

A pleasantly plump *Echinocactus texensis* collection from Roosevelt Co., New Mexico has outperformed our expectations in the pure dolomitic limestone crevices. We are excited to see just how chubby this seed-grown collection grows.

Our 2-foot (60 cm) wide *Clematis hexapetala* 'Mongolian Snowflakes' has excelled in limestone—outperforming itself in compost-based garden locations. We've enjoyed an all-summer flurry of starry white six-petaled flowers.

Agave x *gracilipes*, a seed-grown Kenton Seth selection from Culberson Co., Texas, is now established and steadily suckering through solid limestone. This naturally occurring hybrid between *Agave parryi* subsp. *neomexicana* and *A. lechuguilla* usually struggles in hot rainy summers and cold wet winters, but has proven successful in its urbanite location.

Other Plant Notes:

The Urbanite Outfitters project, like the rest of JLBG, froze solid during a January 2018 cold spell. Raleigh remained below freezing for an unprecedented 200 consecutive hours. Although the minimum temperature was on a par with an average winter low, the duration of the freeze was unprecedented. After the freeze…an abrupt thaw. We watched bewildered as dozens of agaves melted into succulent soup bowls. Cacti and other succulents sailed through for the most part, but what caused the antifreeze endowed genetics of *Agave ovatifolia, lophantha, flexispina*, etc., to fail at temps above 10º F (-12º C)? We probed the soil with an 18-inch (45 cm) long thermometer for answers. We assumed that 100 tons of concrete would provide a warm winter microclimate. Our measurements verified that we had created the opposite microclimate. In the top 6 inches (15 cm), our crevices were up to 5º F (2.6º C) colder than the top few inches of compost-based soil. We suspect the porosity of the crevice mix invited the cold to infiltrate into the crevices. Many marginal succulents acclimated to climates with short winter bursts simply were unable to tolerate frozen roots.

We hear gardeners regurgitate the narrative that native plants won't grow as well outside their native environment. We fact-checked this theory with *Tephrosia spicata*, a delightful fabaceous Wake County native. Tephrosia collected from JLBG's in-situ population, occurring in soil with pH of 3.2, was planted a few hundred feet away into our Permatill™-based crevice mix, a pH greater than 8.0. *Tephrosia spicata* 'Awakening' now thrives in soil 100,000 times more alkaline than its native environment. Myth busted.

Two years addicted to crevice gardening…it's been a wild ride. Every square inch of concrete crevice offers us some insight into the botanical world, and an opportunity to slow down and take a second look. Going forward, we plan to continue growing and diversifying the crevice garden.

The author would like to thank Zac Hill, JLBG Plant Records Specialist and Taxonomist, and Vince Schneider, JLBG Volunteer Curator of Cacti and Succulents, for their help in compiling the data and images for this article.

This crevice garden project was funded in part by a grant from NARGS's Norman Singer Endowment Fund.

Green Spring's Rock Garden: Past and Crevice

Judy Zatsick

THE ROCK GARDEN at Green Spring Gardens in Alexandria, Virginia, was originally designed and created by Don Humphrey, a keen plantsman, skilled propagator, and the first director of the Gardens. An active member in the Potomac Valley Chapter of the North American Rock Garden Society (NARGS), he took advantage of their annual seed exchange to procure future plants for the garden. Don loved propagating rock garden plants from seeds and growing the plants on in his elegant rock garden here at Green Spring.

I never had the pleasure of meeting Don. Former friends and colleagues speak of his incredible plant knowledge and ability to propagate and grow a vast array of plants from all over the country. He is famous for penstemon, eremurus, and other plants we swoon over, and usually kill, here in steamy Zone 7 Virginia. Although his passion for plants was intense and his knowledge impressive, he was extremely personable. At our biannual garden day events, lines of visitors waited patiently for tips and secrets from Don on growing rock garden plants in our area.

As a horticulturist at Green Spring, I am responsible for the rock garden Don established. The bones of Don's garden are still evident, and some of his original plantings survive today. Don created screes, an alpine lawn, a small meadow, ridges, and an area lined with plastic to hold water for rock garden plants needing boggy conditions. However, one xeric environment Don did not try was a crevice garden. Avid gardeners in the Czech Republic introduced the idea and perfected the building of the crevice garden. Their inspiration is the formations of rocks in the vertical strata found in mountainous regions.

I was first exposed to crevice gardens in the noble state of Colorado, where rock gardening reigns. My heart quickened at the rhythm and texture of upright stones in the Yampa River Valley Garden, the Betty Ford Alpine Garden, and the queen of rock gardens, Denver Botanical Gardens. Acres of rocks grace the state, and these fabulous gardens reflect the state's dramatic terrain. It was all so wonderful, and, well, seemingly unattainable in northern Virginia.

But when I visited the amazing and delightful urbanite crevice garden at Plant Delights Nursery in Raleigh, North Carolina, during the NARGS 2017 annual meeting, I knew I had to have one. If North

The new crevice garden bisected by a path to allow for viewing and ease of maintenance.

Carolina could support a fabulous crevice garden and fill it with cool, rock-loving plants in Zone 7b, I could certainly do it Zone 7a Virginia.

We were awarded two grants to build the crevice garden at Green Springs – one from NARGS to purchase materials and a second from the Pennsylvania Horticulture Society to buy plants.

To research crevice garden construction, I started with an article in *Fine Gardening* magazine by Joseph Tychonievich. A writer, editor of NARGS *Quarterly* and author of *Rock Gardening: Reimagining a Classic Style*, Joseph offers all sorts of tips on creating crevice gardens complete with handy illustrations. Next, I reviewed crevice-garden guru Kenton Seth's videos on creating the crevice garden at the JC Raulston Arboretum. Jeremy Schmidt at Plant Delights offered tips in a detailed article on crevice gardening in the Piedmont Chapter's newsletter. And I went back over the classics, looking for information on rock placement and soils.

Armed with measurements of the space I wanted to renovate, I visited Sisler Stone in Falls Church, Virginia. Based on my vision of the future garden and with advice from staff, I selected one palette of West Virginia fieldstone for my base and purchased small sharp gravel for mulch.

With the help of volunteers, existing plants were cleared from the area, and the surface was smoothed. We then brought in several

Top: Builder's sand used to create mounds where crevices will be laid
Bottom left: Large flat stones make great crevice stones. Only inches will show above surface, with bulk creating deep crevice underground.
Bottom right: Deep holes are dug into base of sand and clay. Crevice stones are inserted into the holes.

Top: A rubber mallet used to help set stones
Bottom photos: As stones are selected and put into place,
a pattern develops organically.

11 a.m. and already near 90º F (32º C). Time to put up a tent!

wheelbarrows of builder's sand to construct berms into which the stones would be laid. The berms were formed to create a rounded topography with high points roughly in the center. I decided to create a curved path through the space for easier maintenance and to break up the large area we were trying to cover.

Laying the stone was a very organic process, selecting stones for their shape, color, and size. I found it easiest to remove all the stones from the pallet and sort them roughly according to size.

Then the work began. We lined up the rocks on edge and placed them close together end to end. Once I was happy with the arrangement, I dug a narrow trench into the soil to accommodate the stones. Ideally, about 1/3 of the stone remains above the surface. Once the next row is laid, a deep pocket is created where plant roots can grow in between the rocks. The narrow pocket limits the amount of soil around the roots of each plant, promotes good drainage, and forces the roots to grow deeply to find water and protection from the heat of the sun. Digging into the base soil of clay and gravel and packing it tightly around the stones helped to support the heaviest stones.

Since the garden is on a slight slope, I selected particularly large and heavy stones to support the lower slope and hold the soil layer. We also anchored the ends with larger pieces as the area is heavily trafficked.

After the work was completed, I let the garden rest for a few weeks. Crevice garden experts recommend hosing down the garden several times to help the soil flow into spaces and fill pockets created during construction. Because mother nature took care of rain for us this August, I didn't have to spray it after all. The soil settled in nicely with natural precipitation.

A highly permeable soil mix of two parts sand to one part gravel allows water to drain quickly in our new garden. Water slows as it reaches the base material, which contains clay, sand, and gravel. I am eager to see how plants perform in our soil mix. In some pockets, we played with the soil mix, adding a small amount of compost if the plant specimen required a more nutrient-rich soil. One inch (2.5 cm) of fine sharp-edged gravel mulch helps to keep the crowns of sensitive rock garden plants dry as well as to suppress weeds. I put in *Globularia cordifolia, Scutellaria resinosa, Draba cretica, Dianthus microlepis*, and *Sempervivum*. I'm keeping my fingers crossed.

Don Humphrey left a legacy of great horticultural leadership at Green Spring Gardens, and a beautiful rock garden. It has been a pleasure and an honor to work in his shadow. But the garden also evolves: dwarf conifers that have outgrown their spaces have been removed and replaced with smaller specimens, the rock wall was rebuilt, and now a crevice garden graces the space.

I look forward to experimenting with low-growing plants in the new garden and hope to do a bit of zone pushing. Remember, it just takes two rocks to make a crevice.

The final product

Bog Gardens

Peter Zale

THE USE OF bog gardens to create novel habitats that support an incredible array of otherwise difficult to grow species is nothing new to NARGS members. This style was championed by some of the great members in the history of NARGS. In his *Orchids of the Western Great Lakes Region*, Fred Case wrote about bog gardens and sand-peat beds as a primary means of cultivating otherwise finicky native orchids, carnivorous plants, and their associates found in the bogs of the U.S. Midwest and Coastal Plain. The recommendations given by Case in his book are still relevant and viable today. However, it is time to put a new lens on this style of gardening, not only to reexamine the range of plants that grow in these conditions but also increase understanding of the role this type of garden can play in the modern constructed landscape. Not only do bog gardens serve as a means of beautifying traditional rock gardens and enhancing plant collections, but they can also play a role in safeguarding rare plants and conserving the flora and fauna of globally rare ecosystems.

What is a bog garden?

In its simplest incarnation, the bog garden is a raised bed or excavated area lined with an impermeable layer (pond liner, roof liner, polyethylene, natural material, etc.) that is filled with a substrate that supports the growth of plants that need wet to damp, acidic conditions to thrive. Ideally, beds should range from 12 to 30 inches (30 - 76 cm) deep and the generally recommended medium is a roughly 50:50 mix of sphagnum peat (from the compressed rectangular bales) and silica sand (blasting sand is typically recommended, I use Quikcrete all-purpose sand). Intuition and previous information suggest that bog gardens should be built on level ground, but innovations in this style of gardening by Ron Determann at the Atlanta Botanical Garden recommend otherwise. One of the primary orchid and carnivorous plant habitats in the southeastern U.S. is a seepage slope bog. These bogs occur where water slowly seeps out of deep layers of sandy soil overlaying an impermeable layer of subsoil, typically clay. The water cannot drain through the impermeable layer and is forced out through the sand layer, resulting in permanently damp or wet soil even on a hillside. There is constant, slow drainage of the water through the bog and the water and soil are well-aerated. Bearing this in mind, Determann suggests an alternative type of bog garden, like

Lilium catesbaei flowering at the edge of the bog garden with *Calopogon tuberosus* and a form of *Sarracenia* × *catesbaei* from the Florida panhandle in the background.

those described by Case, but built on a moderate slope to promote slow drainage of water through the medium and increase aeration. This also helps to prevent stagnation, which occurs when the medium becomes anaerobic and loses the ability to support the growth of unique plants. In my garden, I have adopted Determann's approach with great success. Not only are the gardens built on a moderate slope in full sun, the depth of the medium and ratio of sand and peat mix is varied to create conditions more representative of natural bogs. This creates microhabitats for growing plants in close proximity that require different conditions and allows for some plants find their own preferred part of the garden through natural reseeding. In my primary bog garden, which is about 30 feet (9 m) long and of variable width, the upper part of the bog is 18 inches (46 cm) deep and filled with 50:50 sand:peat. Immediately next to it on a gradual slope is an area of pure, 12 inch (30 cm) deep sand that supports drainage and filtering of water from the upper part of the bog. In the summer, the top layer of sand is completely dry, but damp to wet 3 to 6 inches (7.6 to 15 cm) down. This is an ideal place for establishing unusual native milkweeds such as *Asclepias cinerea*, the incredible *A. humistrata*, and *A. michauxii*, in addition to xeric shrubs like *Lyonia ferruginea* and *Asimina obovata*. There is much room for experimentation in this bog garden microhabitat. Below the pure sand is an 18-inch (46 cm) layer of 50:50 peat:sand to support pitcher plants, orchids, and ericaceous plants, followed by an area that is only 6 inches (15 cm) deep and consists of pure wet sand. The last area is experimental, but so far has been ideal for establishing self-sowing seedlings of various *Drosera* species, live sphagnum, and Venus flytrap (*Dionaea muscipula*).

In southeastern Pennsylvania, the normal rainfall is enough to maintain adequate moisture in the bog garden. Periodic use of tap water is okay to irrigate with in the occasional exceptionally dry period, but if regular irrigation is needed, rainwater, or another water source free of dissolved solids and chlorination, should be used.

Plant selection for bog gardens: Sarracenia

Many bog gardens are designed and installed to accommodate a collection of the charismatic flora of the eastern North American Coastal Plain and sphagnum filled bogs of the recently glaciated Midwest and far north, with sarracenia featured prominently. Although there is continued interest in hybridizing sarracenia amongst hobbyists, my collection is focused on growing species and hybrids of known wild origin to serve as a reference conservation collection and to showcase unique variants not typically seen in gardens. Some of the showiest have been seedlings of the well-known *S.* × *catesbaei* grown from seeds collected in Brunswick County, North Carolina. The almost glowing,

Left: *Sarracenia* ×*areolata* is among my favorites for the bog garden. Shown here is a selected seedling under evaluation.
Right: Some forms of *Sarracenia alata* produce nearly black pitchers. The best coloration occurs in late summer in full sun conditions. Here is a form seen in the wilds of southern Mississippi.

bright red pigmentation of plants from this area is derived from the local forms of *S. purpurea* subsp. *venosa* that are distinct from all other populations of the species. Personal favorites also include *S. pupurea* subsp. *venosa* var. *burkii* in its many forms and hybrids, *S. leucophylla*, and especially *S.* × *areloata*. This hybrid between *S. leucophylla* and *S. alata* is extremely variable in the wild and many different forms can be found there and in nurseries. An added benefit of *S. leucophylla* and its hybrids is that they produce many pitchers in the later summer and fall, adding bright colors as the growing season for many other plants is coming to an end. *Sarracenia alata* is also worth growing, especially if you can find the forms with nearly black pitchers. Sarracenias are among the most commonly poached plants from the wild and most are now protected where they occur. There are many commercial sources, and they are extremely easy to grow from seeds. In addition, they are much more cold hardy than their southern origins would indicate, with most being reliably cold hardy into USDA hardiness Zone 5.

Eastern North American Lilies

I originally built bog gardens as means for experimenting with growing some of the uncommonly cultivated lilies of the southeastern U.S. *Lilium iridollae*, Mary Gibson Henry's pot-of-gold lily, thrives in peaty parts of the bog garden and flowers in August in southeastern Pennsylvania. Despite its southern origins, it is perfectly cold hardy in Zone 6. The flowers are born on characteristically long pedicels, culminating in a particularly graceful and long-lasting display. *Lilium catesbaei*, the pine lily, a plant with a reputation for being difficult, grows easily in a bog garden. If a seedling population can be grown, different individual plants flower from July to September, providing a long period of interest. It is probably more difficult to find seeds than it is to grow the plant. It is a variable species typically with orange flowers, but occasionally yellow or cream-colored flower variants occur, such as one I grew from a batch of seeds collected at the western edge of the species range in Louisiana. This species can be short-lived but is easily propagated from seed and one of the easiest lilies to propagate by scaling. The rare *Lilium pyrophilum*, *L. grayi*, and forms of *L. superbum* from the Coastal Plain and the Fall Line in Georgia also grow well in bog gardens. Eastern U.S. native lily plants are pollinated by various lepidoptera, and when they flower in my garden, the tiger and spicebush swallowtails are frequently seen visiting the flowers. A related star of the late-summer garden is *Stenanthium gramineum* var. *robustum*. Originally grown from seeds collected in Gallia County, Ohio, it took seven years to flower and produced enormous spikes of white flowers for a display that lasted for weeks.

Lilium iridollae flowers in late summer and attracts swallowtail butterflies

Left: *Asclepias rubra*
Right: *A. lanceolata*

Asclepias

A genus rarely discussed for sunny bog gardens is *Asclepias*. As mentioned above, many of these prefer more xeric habitats, but a couple of species prefer saturated, acidic soils in the wild and are excellent bog garden subjects. *Asclepias rubra* is of conservation concern throughout its range and considered extirpated in Pennsylvania. Plants grown from seeds collected in Delaware have thrived in my bog garden and flower every year in June and July, but rarely set seeds. *Asclepias lanceolata* prefers the same conditions and dazzles during the summer with its richly and variably colored, yellow, orange, and red flowers. Although the inflorescence of this species is few-flowered, it makes up for it by having unusually large individual flowers. These species are known to hybridize in the wild and give rise to some fantastically colored hybrids. Unfortunately, they do not appear to be in cultivation. Many other species from the Coastal Plain bogs of the Southeast are worth trying, but seeds can be difficult to obtain.

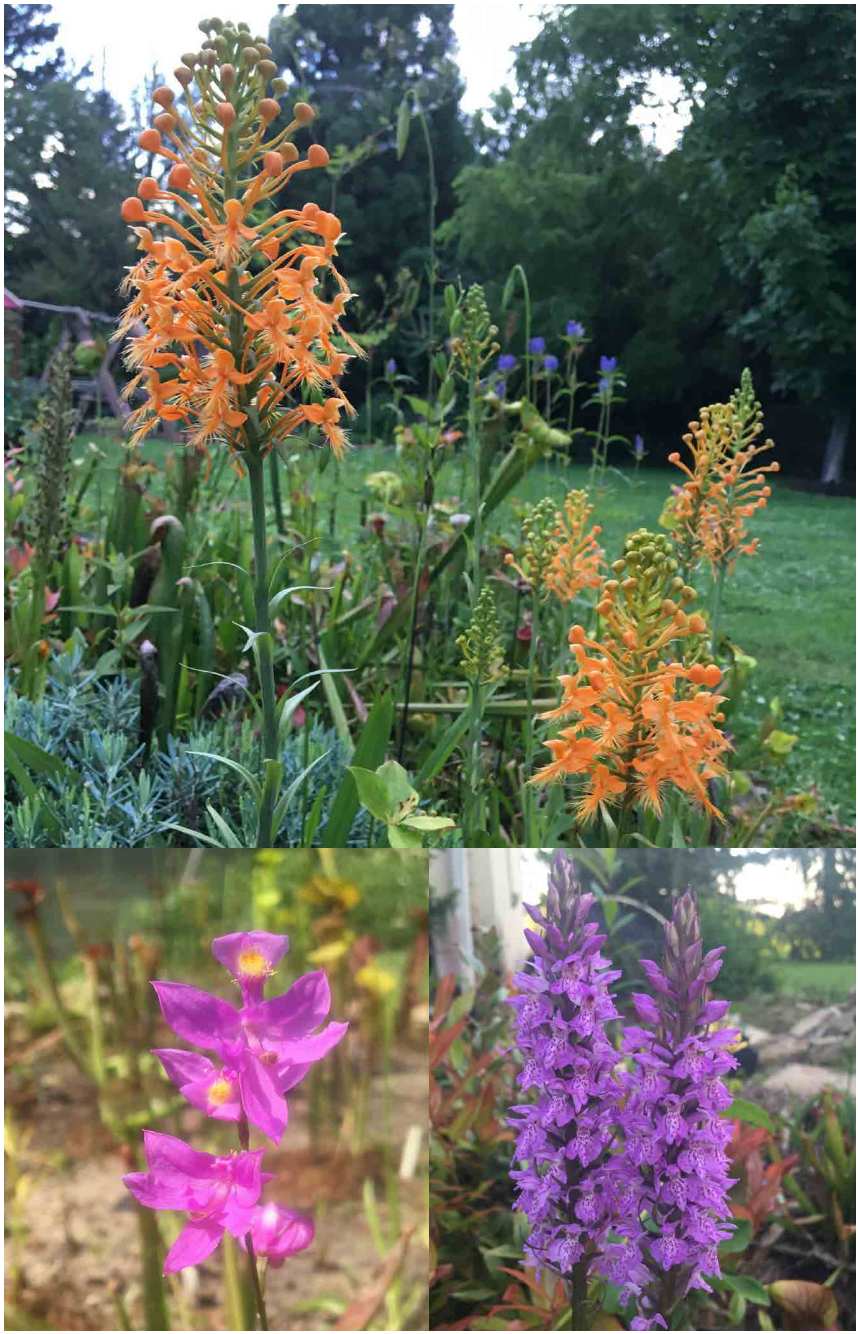
Shrubs

Shrubs are an important, but often overlooked component of bog gardens. In my experience, the root systems of shrubs are vital for helping circulate moisture through the medium and mitigating soil moisture during extremely wet periods as well as providing additional microsites for smaller, less vigorous plants such as pinguicula and orchids. Several native shrubs can be considered. *Andromeda polifolia* 'Blue Ice' has been a bog garden stalwart with me for the last ten years. It survives extremes of heat and cold, looks good throughout the year,

and rarely needs pruning. Other native shrubs to consider include *Chamaedaphne calyculata* (can be aggressive); various kalmias including *K. angustifolia, K. carolina, K. cuneata*, and *K. hirsuta*; many other types of ericaceous plants including *Rhododendron* (*Rhodora*) *canadense*, and various *Lyonia* and *Vaccinium*. This is also an area for experimentation. The finicky Japanese native *Leucothoe keiskei* 'Royal Ruby' has thrived in a sunny bog garden for numerous years and some of the high elevation dwarf rhododendron from China, such as *R. tsaii* and *R. campylogynum* are showing promise after a couple of years of evaluation. The bog garden may be the only way to grow high elevation species of this genus in a hot, humid summer climate long term. The choice, dwarf shrubs of the genus *Shortia* (including *Schizocodon*) take patience to establish but are right at home in shady nooks of the bog garden. This is may be one of the only ways to grow them in regions where soils are not suitable.

Orchids

Orchids are among the stars of the bog garden and one of the primary reasons I started to experiment with them. Some of the fringed or bog orchids of the genus *Platanthera* are readily grown in bog gardens. The orange fringed orchid, *Platanthera ciliaris*, and its white-flowered counterpart, *P. blephariglottis* thrive and reliably flower in mid-summer along with many of the lilies and provide another source of nectar for swallowtail butterflies. Perhaps the showiest is *Platanthera peramoena*, the purple fringeless orchid. It grows readily in a bog garden but is one of the more difficult *Platanthera* to source and difficult to grow from seeds. Other species, including *P. clavellata* and *P. lacera* have been successful and as seed propagation protocols for these species continue to develop, others will be available in the future. Other native orchids for bog gardens include the well-known grass pink, *Calopogon tuberosus*, and its relatives. I find that these naturally reseed if conditions are right and tend to place themselves among shrubs. There are now dozens of them throughout the gardens. Other calopogons, such as the hybrid 'Fluffy', have been just as easy to grow. *Pogonia ophioglossoides*, the rose pogonia, requires consistently wet conditions, but prefers live sphagnum. Bogs gardens have been one of the only ways to support long term growth of the western European marsh orchids of the genus *Dactylorhiza*. Hybrids involving *D. elata, D. fuchsii, D. majalis, D. purpurea*, and others have been steadily growing and increasing in size for the past five years. Many other species thrive here as well including *Eleorchis japonica, Neottia bifolia, Spiranthes ochroleuca*, and others also thrive. The bog garden is an ideal place to try a wide variety of temperate terrestrial orchids.



Top: *Platanthera ciliaris* flowering profusely at the bog garden edge. Also seen here are *Andromeda polifolia* 'Blue Ice', *Medeola virginiana*, *Gentiana linearis*, and various *Sarracenia*.
Bottom left: Carson Whitlow's *Calopogon* hybrid 'Fluffy' is easy to grow in bog gardens, but difficult to source
Bottom right: European marsh orchids (*Dactylorhiza)*

An individual of *Polygala lutea* growing through *Rhododendron tsaii*

Bog Garden Weeds

Bog gardens come with their fair share of weeds, both good and bad. One of the most rewarding bog garden weeds is *Polygala lutea*. Affectionately known as "bog Cheetos" in some gardening circles, it is one of the hallmarks of the sunny bog garden. This biennial produces short dense heads of golden-yellow flowers from June until frost in my garden and seeds itself into appropriate areas of the garden, but never aggressively so. Other polygalas such as *P. brevifolia* and *P. cruciata* are beautiful summer flowering plants that have been slow to establish but are starting to show promise. In my experience, nearly all the native *Drosera* species are individually short-lived and need to renew themselves from seeds. *Drosera filiformis* is among the most charismatic, but the small rosettes of *D. rotundifolia* and *D. intermedia*, and even smaller rosettes of *D. brevifolia* beg close inspection. Many other species are worth trying, both native and non-native. Perhaps the worst weed of bog gardens is *Rhexia virginica*, the meadowsweet. While a lovely native plant deserving of wider cultivation, it can become noxious in a bog garden, where it sends out long runners that rapidly grow and outcompete slower growing plants. I am trying *Rhexia aristosa* and so far appears to be much less aggressive with much larger, deeper colored flowers than the former. The cranberry, *Vaccinium macrocarpum*, can also be a weed, forming an impenetrable mat and rapidly choking out other plants. There is one exception, the slow-growing cultivar 'Hamilton' can be used in bog gardens without fear that it will become weedy.

Bog gardens in the shade

More recently I have been developing bog gardens in a protected, shady part of the garden. It is constructed the same way as previously described, but allows for experimentation with a completely new array of plants from around the world that had proven intractable in other parts of the garden. So far, the results have been extremely encouraging. *Polygala* is a favored genus, and the shady bog garden is proving to be an ideal way to cultivate the desirable native spring wildflower *Polygala paucifolia* in my hot, humid southeastern Pennsylvania climate. This species is common in the cooler, mountainous parts of central Pennsylvania and study of its native habitat confirms its need for a cool root-run and consistently moist, organic soil. Another group of native plants rarely seen in gardens and ideally suited for a shady bog garden is the genus *Parnassia*, grass of Parnassus. All native parnassia are late summer to fall flowering plants known for their white flowers stenciled with intricate green veins. They have a reputation for being difficult to grow, but *Parnassia asarifolia* and a unique form of *P. grandiflora* from central Tennessee have proven to be an easy-growing, and stunning addition to the shady bog garden. There are many Asian species, including *Parnassia foliosa*, with remarkably fimbriate flower petals, that are well worth trying ,too, but rarely available. Other choice Asian plants thrive in bog gardens. Several heloniopsis thrive and are among the earliest plants to flower. *Heloniopsis orientalis, H. orientalis* var. *breviscapa* 'A-so', *H. tubiflora* 'Temple Blue', and the related *Ypsilandra thibetica* have been favorites, in addition the native *Helonias bullata*, which also thrives here. The diminutive *Trillium pusillum* var. *virginianum*, which occurs in damp or wet conditions in the wild, has grown extremely well in shadier parts of the bog garden along with the associated *Arisaema pusillum*. Several Asian primula species are also being tried here in addition to a wide variety of plants from Asia that require similar conditions, several native lycophytes, and a variety of orchids.

Sourcing Bog Garden Plants

Many of the plants discussed here are rare, threatened, or endangered in the wild. Plants should be sourced from nurseries with responsible and sustainable propagation and production practices, although many will be difficult to find commercially. The best and most rewarding way to obtain these plants is through seed propagation. Many of them are easily grown from seed and seeds are often found through various seed exchanges produced by special interest plant societies. Some plants, such as drosera and polygala are short-lived, and the only reliable way to keep them in the garden is to establish reseeding populations. Although there may be a substantial initial effort to install bog gardens, the ease with which such choice plants can be grown is instantly rewarding and long-lasting.

In Memoriam: Richard Dufresne

Tony Avent

IT IS WITH a heavy heart that we share news of the passing of our friend Richard Dufresne (pronounced Doofrane), 75, who passed away at his home in Candor, North Carolinain December 2018. Rich was truly one of a kind. He graduated in 1972 from Carnegie Mellon with a PhD in chemistry. After graduation, Rich did the post-doc shuffle, first at Johns Hopkins, then Brandeis University, and finally University of Massachusetts, before signing on with Lorillard Tobacco Company in North Carolina as a flavor chemist. There, he researched organic chemical compounds to flavor tobacco. What else could you do with three post docs and a PhD thesis titled *Thermal cyclizations of 3-(2-arylhydrazino)-3-pyrroline derivatives: a study of the Fischer indole synthesis*?

Rich was a regular at our nursery and garden, where we both benefitted from the mutual exchange of plants and information. When Rich last visited us about eight weeks ago, it was obvious to us that we were seeing him for the last time. His health had deteriorated due to a cascade of medical issues and a lifetime of less than healthy eating. His XXL clothes were now tightly strapped to a frail frame that was only a shadow of the Rich we'd seen earlier in the year.

I first met Rich in the mid-1980s at a North American Rock Garden Society meeting, where he was extolling the virtues of the salvias he'd brought for show and tell. Rich would always drive the meeting organizers nuts since he had no "off switch" or ability to read social cues. Rich was ridiculously brilliant, had an unquenchable passion for salvias and their relatives, but also had a uniquely wired brain that left him only marginally functional in society.

What Rich did so well was to connect people with plants and other plant people. He used every form of communication possible to share knowledge far and wide, including his website, WorldofSalvias.com. Rich has done more for the world of ornamental salvias worldwide than probably anyone in the last century. His early introductions like *Salvia* 'Maraschino', *Salvia* 'Dark Dancer', *Agastache* 'Tutti Fruiti', and others were the first hybrid clones in both genera that started a horticultural revolution.

Rich's chemistry job allowed him to buy a house, start a garden, and a small backyard nursery in nearby Greensboro, North Carolina. Sadly, in the mid-1990s, Rich was dismissed from his chemistry job, due to his remarkable inability to complete even the most basic tasks or focus on anything for a meaningful period of time. Shortly after losing his job, Rich also lost his house, garden, and greenhouse since, despite not working, he couldn't manage to find time to file for unemployment benefits, until he was hauled to the Unemployment office by friends. Because of his mental health issues dealing with focus, Richard would never be able to find another job, despite the best efforts of friends who tried to help.

To try and make ends meet, Rich would propagate an array of salvias and drive cross country to sell them at plant fairs, despite losing money simply traveling to each event. In many ways, despite his brilliance, Rich was like a naive child who needed protecting from both himself and others. Were it not for the kindness of a plethora of friends who kept Richard supported financially, there's little doubt he would have been homeless, instead of living in the marginally habitable houses he inhabited during the later years of his life.

Despite being perpetually followed by black clouds (no rubber left on his tires when he tried to run errands, getting mistaken for a drug dealer and put in jail briefly last fall because of his license plate "Salvia", and only recently taking a financial hit after falling prey to one of the prevalent Social Security phone scams), Rich was the eternal optimist. Even during his last visit, he was so excited about his ambitious plans for the upcoming year. True to the end, he managed to bring a new salvia to share, which is now flowering in his memory.

Rich was not only incredibly kind but passionate about sharing, and his legacy will live on through all the plants and information he shared.

Thankfully, a year ago, Rich was finally honored by the North American Rock Garden Society with the Marcel LePiniac Award at its national meeting. It was my honor to know Rich for 30+ years, so thank you, my friend, for all you did…life well lived.

Photo by Bobby J. Ward, May 2013

NORTH AMERICAN ROCK GARDEN SOCIETY

Bulletin Board

Spring 2019

volume 77 | 2

President's Letter

You have recently read in our winter issue of the *Quarterly* that the NARGS Board of Directors approved that the summer 2019 issue of the *Quarterly* will be available ONLY online.

Three boards have discussed this decision and come to the same conclusion: NARGS cannot afford to print and mail four issues. Ideally, two issues should be mailed and two digitized on line. Other groups have had to face the trend toward digital; we are not alone. Change is inevitable, but we are proceeding slowly. We are somewhat less concerned about attracting new members through digital than we are dedicated to providing access to our core membership. For several years we have been printing and mailing copies of the *Quarterly* and also posting a digital copy on our web site; some of you have chosen to read the online version only, asking us not to mail a print copy. Now, in order to significantly economize, we can no longer print every issue of the *Quarterly*.

For example, the cost savings with two digitized issues are significant, but we are willing to proceed slowly, starting with the summer 2019 issue. There is no need to remind you that membership is down and postage costs are soaring. We have put a financial plan in place that reduces some convenience but allows us to offer more experiences in other areas, such as trips with botanizing opportunities, traveling speakers, annual meetings, and study weekends. These are some of the reasons we joined NARGS, and that is the commitment we intend to keep. And remember: some issues of the *Quarterly* will continue to be more jam packed than others. Digital does not mean less information. Frankly some members like to enlarge the font for easier reading online.

As you know NARGS is a plant society which brings the joys of adventure with our speakers and experts closer to our members. NARGS chapters are essential for the whole experience. In the next few months we will be reaching out to chapters on ways of improving the NARGS experience. We are one organization, and we need to complement each other.

Just five years ago, we almost had to close shop and the future was dismal. Although your donations gave us hope, donations are not a sustainable way to operate. Recently, a member generously endowed the travelling speaker fund for five years. This will allow for more speakers in chapters that simply can't afford the cost. We also receive donations for the *Quarterly*, for the seed exchange, stipends, and other member initiatives. We are grateful, but it's not enough. Memberships are still the bread and butter of our livelihood. Until we get back 300 people, and this is possible, we will make some cuts in our services. You may have seen our advertising in *Horticulture Magazine*, and we are seeing a response.

As for those members with no internet access nor emails, Instagram, Facebook and the like, it is going to be extremely difficult to communicate. It's in your best interest to have computer access especially in terms of needed services and safety. Perhaps you can have access through a relative or friend or even the public library. Can your chapter assist you by passing around a downloaded copy of the *Quarterly*?

Because the summer 2019 issue of the *Quarterly* will be going to digital format only, the Seed Exchange Donation Form and Instructions – as well as the Import Permits for members living outside the United States – previously mailed to you in the summer issue are all enclosed with this spring issue of the *Quarterly*. (See the Seed Exchange report on page 176.)

Please give us your email address, if you have not already done so. Email to: nargs@nc.rr.com. We will continue to use <admin@nargs.org> to send you membership information, society news, and updates. And we will use Mailchimp (nargs@nc.rr.com) to send you information about future trips, meetings, etc. Remember: we do not share your email address outside NARGS.

Thank you.

Betty Anne Spar

Email: bettyannespar@gmail.com

NARGS Donations

Donations to NARGS between
November 1, 2018 and January 31, 2019.

To support the Traveling Speakers Program, Seed Exchange, Web site, Rock Garden Quarterly, the general fund, and in memory of Glen Patterson, Darcie McKelvey, and Richard Dufresne.

Anonymous (Missouri)
Connecticut Chapter of NARGS
Delaware Valley Chapter of NARGS
Potomac Valley Chapter of NARGS
Rare Plant Group (Wisconsin)
Anthony, Janice (Maine)
Baer, Christine (Michigan)
Baker, Pat (Colorado)
Barrett, Karen (Maryland)
Bendall, Matt (Australia)
Bennett, Teri (Virginia)
Bolt, Joan F. (Michigan)
Bouffard, Vivien (Massachusetts)
Boulby, Christine (United Kingdom)
Bowlby, Astrid (Maine)
Breyfogle, Ross (Colorado)
Brown, Alison (Maine)
Bush, Allen (Kentucky)
Byra, Chris (British Columbia)
Caroff, Julia (Michigan)
Carr, Darwin (Nova Scotia)
Church, Clara (California)
Clark, Mary (Minnesota)
Collins, Jane (Virginia)
Conway, Gregory (Quebec)
Cook, Scott (United Kingdom)
Cooper, Barbara (Ontario)
Cumbleton, Paul (United Kingdom)
Curtis, Lee (Colorado)
Dearing, Michael (Wisconsin)
Deeks, Constance (New Jersey)
Deutsch, Ray (California)
Dumont, Judith O. (New York)
Dunstan, Paul (United Kingdom)
Emmons, Betty Lou (Illinois)
Evanetz, Susanne (British Columbia)
Faden, Robert (Virginia)
Ferree, Louisa (Massachusetts)
Ferris, Terry (Minnesota)
Fisher, Alister (New Zealand)
Flintoff, J. John (Washington)
Franklin, Catherine W. (Alaska)
Friberg, Shirley (Minnesota)
Gamlin, Robert (New Hampshire)
Gilrein, John (New York)
Glavich, Thomas (California)
Goldman, Doris A. (Pennsylvania)
Goldsworthy, James (Washington)
Gomez, Annette (Wisconsin)
Gonzy, Michele (France)
Gray, Gail K. (Colorado)
Green, Richard (United Kingdom)
Groeger, Andreas (Germany)
Grushow, Jane (Pennsylvania)
Gryboski, Maryanne (Connecticut)
Haas, Joan T. (Pennsylvania)
Hale, David (Oregon)
Hall, Steve (Oregon)
Hampton, Sandra Kay (Illinois)
Hansen, Robin (Oregon)
Hendrickson, Daniel (Michigan)

Hennessey, Barry (United Kingdom)
Hensley, Christopher (Ohio)
Hewgley, Greg (Colorado)
Hewitt, Sigrid (Rhode Island)
Highberg, Patricia (Vermont)
Hihara, Seisuke (Japan)
Hirsch, Eric (New York)
Hoeffel, Joan (New York)
Horwitz, Lola Lloyd (New York)
Howard, Bob (Nova Scotia)
Hoy, Troy (Norway)
Hubbard, Neil (United Kingdom)
Huggler, Carol M. (Calgary)
Huling, Ray (Rhode Island)
Hultman-Hallberg, Annika (Sweden)
Illman, Richard John (Australia)
Jakob, Maria-Louise (Germany)
Jaward, Susan (Ontario)
Jones, Sam (North Carolina)
Kantor, Joseph (Iowa)
Kelley, Sabra (North Carolina)
Kidd, Cameron (British Columbia)
Koch, Helen (Maine)
Koltun, Nancy (Illinois)
Kosonen, Kirsi (Finland)
Krementz-Bigliani, Anne (New Jersey)
Kueppers, Carol (Pennsylvania)
Lane, Amelia P. (North Carolina)
LaPlante, Fred (Washington)
Lawrence, Starling R. (New York)
Lease, Deborah L. (Ohio)
Leggatt, Anna (Ontario)
Lenkoski, Peter (California)
Lewis, Mary (New Hampshire)
Little, Ruth (North Carolina)
Lumsden, John S. (Ontario)
Lyster, Michael (Colorado)
Macartney, Kathy (Ontario)
MacGregor, Elizabeth (United Kingdom)
Magowan, Robin (New Mexico)
Magyar, Sandra L. (Connecticut)
Maltby, David (Ontario)
Marsolo, David (Ohio)
Mauritz, Sara (Oregon)
McDowell, Marta (New Jersey)
McGough, Lynn (Australia)
McGowan, Brian (Massachusetts)
McIntosh, Kevin (Maryland)
McKanna, Jane (Australia)
Meszaros, Patricia (Saskatchewan)
Mistry, Nari (New York)
Moamar, Amal (Massachusetts)
Montague, Dan & Pat (Washington)
Moscetti, Paula (New Jersey)
Muggli, Michael (Minnesota)
Mustin, Sarah (New Hampshire)
Myrick, Valerie K. (California)
Norrback, Kaj (Finland)
Norris, Kelly (Iowa)
Norris, Peter (Massachusetts)
Norton, David (Massachusetts)
Novak, Janet (Pennsylvania)
Nygaard, Danton (Maine)
Open, Michael (France)
Petersson, Kerstin (Sweden)
Phelps, Laurence (Wisconsin)
Pilon, Holly (Michigan)
Plankeel, J. W. (Netherlands)
Pomfret, Mary (Ontario)
Rafferty, Sean (British Columbia)
Rembetski, John (New Mexico)
Rettenmund, Scott (Washington)
Richardson, Kathleen (Washington)
Ripperda, Jerry (California)
Robertson, John (Illinois)
Rodich, Richard T. (Minnesota)
Rose, Barbara (Virginia)
Ruault, Bob (Alberta)
Sanderson, Amy (British Columbia)

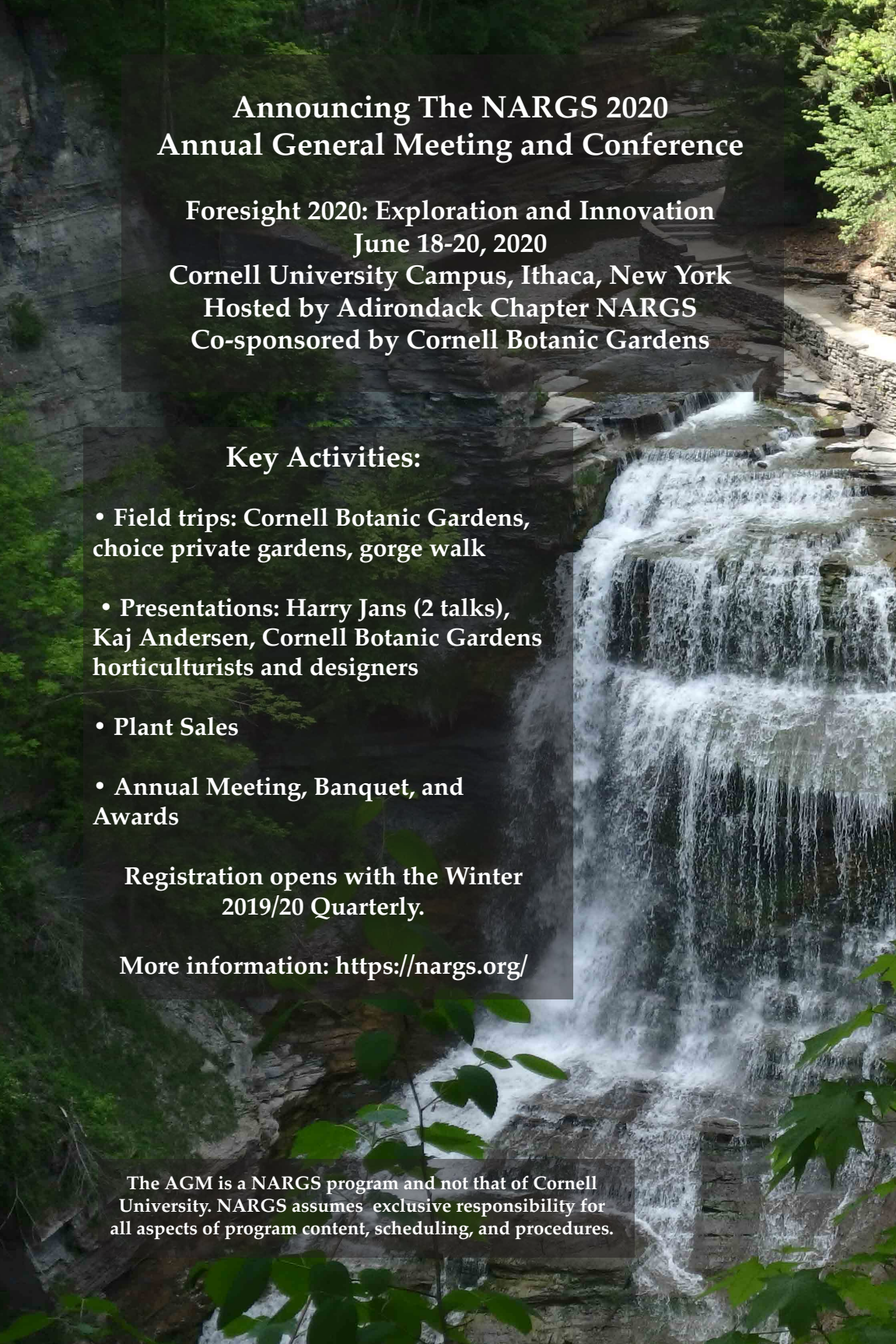
Donations Continued

Schleifer, Liane Amy (Georgia)
Schramm, Nancy (California)
Scott, Caroline (Alberta)
Sharpe, Jim (Nova Scotia)
Shepard, Cecile (California)
Shivrattan, Ray (Ontario)
Smith, Carole P. (Ohio)
Soper, Lynda (Ontario)
Spriggs, Paul (British Columbia)
Staniland, Rob (Alberta)
Stella, Mary (Alaska)
Stuart, Rob (Ontario)
Swick, Kathleen (Alaska)
Tarrant, Georgina (Nova Scotia)
Thompson, Jennifer (Wyoming)
Thompson, Leah (Oregon)
Thornber, Michael (United Kingdom)
Tou, Vello (Ontario)
Turunen, Michael (Finland)
Tychonievich, Joseph (Virginia)
Ulmann, Charles and Mary Ann (Pennsylvania)
Vanspronsen, Arie (Ontario)
VanSteen, Ferdinand (Ted) (California)
Varga, Laszlo (Hungary)
Vaxvick, Linda (Alberta)
Verbeek, Rosalinda (British Columbia)
Voran, Allyson (Utah)
Wagner, Jeff (Colorado)
Waldrep, Lynda (North Carolina)
Walker, Sally (Arizona)
Waltz, Peter (New Hampshire)
Warner, Gary (New Jersey)
Watts, Ann C. (New Jersey)
Weiss, Edward (Michigan)
Wiersdalen, Inger Lise (Norway)
Williams, Linda (Oregon)
Williamson, Chris (North Carolina)
Willis, John (Maryland)
Wollenberg, Bert van den (Netherlands)
Wosczyna, Bridget (Pennsylvania)
Wysocki, Raymond (New Jersey)
Young, Michael K. (Montana)
Zander, Elisabeth B. (Connecticut)
Zeeh, Reiner (Germany)

Patrons

The following recently became NARGS Patrons:

Bowlby, Astrid (Maine)
Burnet, Thornton W., Jr. (North Carolina)
Clayton, Hilary (New Jersey)
Ferree, Louisa (Massachusetts)
Kruesi, Kate (Vermont)
MacFarlane, Radford (Delaware)
Maran, Mary M. (Pennsylvania)
Mauney, Katherine (North Carolina)
Shepperly, Katherine (New Jersey)
Switzer, Russ (British Columbia)
Tonnesen, Alex (Colorado)



Announcing The NARGS 2020 Annual General Meeting and Conference

Foresight 2020: Exploration and Innovation
June 18-20, 2020
Cornell University Campus, Ithaca, New York
Hosted by Adirondack Chapter NARGS
Co-sponsored by Cornell Botanic Gardens

Key Activities:

- **Field trips: Cornell Botanic Gardens, choice private gardens, gorge walk**

- **Presentations: Harry Jans (2 talks), Kaj Andersen, Cornell Botanic Gardens horticulturists and designers**

- **Plant Sales**

- **Annual Meeting, Banquet, and Awards**

Registration opens with the Winter 2019/20 Quarterly.

More information: https://nargs.org/

The AGM is a NARGS program and not that of Cornell University. NARGS assumes exclusive responsibility for all aspects of program content, scheduling, and procedures.

2020 Annual Meeting

& Pre- and Post-Conference Tours

Next year's NARGS annual meeting will be held in Ithaca, New York, on June 18 – 20, 2020, on the campus of Cornell University. It is hosted by the Adirondack Chapter of NARGS and co-sponsored with Cornell Botanic Gardens. Registration for the meeting will begin January 2020.

In conjunction with the annual meeting next year, the NARGS Tours and Adventures Committee has organized a pre-conference tour on June 15 – 17, 2020, to see the native flora of the Adirondack region, including vegetation of Whiteface Mountain and bogs of the western Adirondacks. Also, a post-conference tour will be on June 21 – 23, 2020, and will visit five public and private gardens in the Hudson River Valley. Registration for both tours is open now. For information about the annual meeting and the two tours, go to the NARGS web site at www.nargs.org and click on "Latest News" midway down the page.

Tours and Adventures Survey Report

The Tours and Adventures Committee has been actively involved in planning tours in North America and overseas. The goal of the committee is to provide affordable, high quality, botanizing opportunities, while providing income to the society. To help with tour planning, the committee conducted a survey asking members to share their travel interests and priorities. Responses were received from roughly 10% of NARGS members. The survey indicated that tour destination and itinerary are very important. Seeing plants in their native habitat is a top priority, followed by visits to public and private gardens. The top-rated destinations in North America (in order of preference) were the Mountain West, Alaska, and the west coast of Canada; the U.S. west coast and Southwest; and the northeastern U.S. and eastern Canada. Top rated destinations elsewhere in the world include the Mediterranean, Central Europe (e.g., the Alps and the Czech Republic [Czechia]), the British Isles, and South America.

Over 90% of the respondents were interested in tours that were a week or more in length, compared to less than 25% who were interested in 2-3 day (long weekend) tours (these percentages sum to more than 100% because some respondents were interested in tours of any length). Roughly a third of respondents also indicated that they were interested in optional activities (such as the Chelsea Flower Show or cultural history events). Most of the respondents were comfortable with a price $250-300 per day, while some were willing to pay more and some wanted to spend less. Several respondents suggested that meals not be included in the tour price because of personal dietary needs or preferences, and others were interested in tours that could accommodate participants with mobility limitations.

For information, contact David White, chair:

dmwhite_nc@yahoo.com

Seed Exchange

As I write this report in the midst of a successful 2018-2019 Seed Exchange, warm thanks are due to the many, many members (also friends and relatives) who have contributed to that success. We deeply appreciate their commitments of time and energy:

- Some extraordinary seed donors (Panayoti Kelaidis, Rick Lupp, John & Laura Serowicz, Ron Ratko);

- Dozens of individual and chapter packagers (too numerous to name, but we thank you all!);

- Coordinators of both the Main and Surplus distributions (Watnong Chapter: Hilary Clayton, Pat Hilgendorff, Martha Podilchuk and Don Grossman; Wisconsin-Illinois Chapter: Ed Glover).

And, of course, all the NARGS members who supported the Seed Exchange by requesting and purchasing seeds. We are especially grateful to those who additionally donated funds earmarked for the operation of the Seedex.

Most of all, we are grateful for the continuing (almost continuous) work of our Seed Intake Manager, Laura Serowicz. In full, her title should also include Chief Packager in Charge, Seedlist Producer, Online Seed Ordering Manager, and Patient Hand-holder for Seed-Orderers in Distress.

Without such help, at every step in this complex process, we would not have the joy of perusing and ordering from the wide range of options. We hope that you took advantage of both the Main and Surplus rounds to obtain all those seeds you really “need.”

As a final thank-you to our members, we always conclude each year’s Seed Exchange by dividing the remaining packets (including some surprisingly choice items) among those chapters that request them. These seeds are sent free of charge, and they are shared among chapter members, as well as with local community organizations (schools, scouts, botanic gardens, and garden clubs) to raise awareness of NARGS.

I contact all chapters in March to remind them to sign up for the seed giveaway; be sure your Chair responds.

Let us begin, at this time of garden rebirth, to plan for the Seedex ahead. Whether you consider your garden as work, play, or respite, please think of how much the contributions from other members have meant to its (and your) growth. Continue that tradition of sharing by donating seeds from your gardens or your travels. Send seeds of easy-to-grow plants (every new gardener has to begin somewhere) or your more challenging alpines, woodlanders, perennials, bulbs, and shrubs (show off your hort chops).

A donation of five packets of different kinds of seed will gain you an extra ten packets in your order... plus a move to the head of the queue when the orders are filled next January. Begin planning now; begin collecting this spring (especially seeds of early ephemerals); and begin sending the seeds this summer (and again in the fall).

Please note: Because the summer issue of the *Quarterly* will be going to digital format, the Donation Form and Instructions – as well as the Import Permits for members living outside the United States – are all enclosed with this issue. As always, if these forms were not included, contact Laura Serowicz for a copy:

15411 Woodring Street
Livonia, MI 48154-3029
U.S.A.
734-522-2294.

We thank you in advance.

Joyce Fingerut, Director
NARGS Seed Exchange
alpinegarden@comcast.net

Regarding Email Messages from NARGS

To comply with internet protocols, in 2018 NARGS began using Mailchimp (a commercial email software package) to send promotional emails to our members. We recently noticed that some of these emails were ending up in spam or promotional folders and that the associated information had not been seen by all members. The technology used by email services looks for certain features (such as embedded links, images, and specific words) to determine in which folders emails are filed (such as Spam, Junk, or Promotional).

For example, in February we sent our membership an email through Mailchimp relating to the 2020 NARGS annual meeting and associated tours and discovered that some of you did not see the message because it went to a spam or other folder in your in-box.

NARGS will use MailChimp for news of future trips or meetings. And our nargs.org mail server will continue to send membership renewal information, society news, updates, etc. Only you, the recipient of the email, can ensure you receive these emails in preferred folders. Depending on your mail application, you may:

• simply redirect future emails to your primary folder by moving our email that ended up in a spam or promotional folder into your preferred folder.

• add the following addresses to your contact list: nargs@nc.rr.com and postmaster@nargs.org and admin@nargs.org

Thank you.

Elisabeth Zander

admin@nargs.org

Show off your Garden

A new regular feature on the NARGS Facebook page will be a weekend photo from a NARGS member, showing a plant or vignette from their garden.

If you would like to have a photo featured, please send a photo to Todd Boland at nfld.todd.boland@gmail.com

We have learned of the death of the following NARGS member:

Art Gordon Guppy, age 92, Duncan, British Columbia

New Members

Welcome to all those who joined between November 1, 2018 and February 1, 2019

Amato, Ann, 12 SE 72nd Ave, Portland, OR 97215-1312
Assayag, Mona, 81 Stonecrop Ln, Cold Spring, NY 10516-3664
Barnes, John, 1601 Medfield Rd, Raleigh, NC 27607-4725
Bell, Gary, 1600 N 22nd St, Lincoln, NE 68503-1111
Bett, William, 12 Lynn Way, Grove City, PA 16127-3842
Binder, Patti, 304 Franklin St, Remsen, IA 51050-1010
Birnbaum, Peter, Cooper's Hollow Farm, 144 Round Top Rd Apt 2, Bernardsville, NJ 07924-2126
Bland, Don, 632 Farnham Rd, Gibsons, BC V0N 1V8 Canada
Bridgen, Austin, 2625 Florida St, Longview, WA 98632-2028
Brodie, Meriel, 413 Morrison Ave, Raleigh, NC 27608-2539
Button, Joanne K., 204 The Parkway, Ithaca, NY 14850-2247
Calhoun, Lisa, 615 Penfield Ave, Havertown, PA 19083-4119
Canning, Scott, 9 La Vega, Lamy, NM 87540-9768
Condon, Aaron, 35 Hethersett Rd, Sassafras, VIC 3787 Australia
Cooper, Joan, 4060 Hillcrest, Highland, MI 48356-2348
Creswick, Karen, 2131 Aerie Heights Cv, Sandy, UT 84092-5279
Curran, Patricia, 10 Slators Ln, Newfield, NY 14867-9735
Drzyzgula, Robert, 1777 NW Upas Ave, Redmond, OR 97756-1873
Dunstan, Paul, 47A Plantation Rd, Amersham, BUX HP6 6HW United Kingdom
Eltgroth, Alicia, 1786 5th St, Livermore, CA 94550-4361
Feather, Sandy, 6747 Shore Ave, Verona, PA 15147-1935
Foster, Jeanann, 2924 Martin Ter, Haymarket, VA 20169-1624
Gannon, Griffin, 2 Armstrong Rd, Morristown, NJ 07960-6303
Gist, Marilyn, 11805 Edgewater Ct, Raleigh, NC 27614-9765
Gunilla, Robert, 70 Denison Rd W, Toronto, ON M9N 1C2 Canada
Hall, Earl, POB 1064, Owen Sound, ON N4K 6K6 Canada
Hall, Steve A, 7238 SW Lake Bluff Ct, Wilsonville, OR 97070-8464
Hamel, Anita, 5200 Benton Ave, Bethesda, MD 20814-2861
Hayward, Pat, 8049 Firethorn Dr, Loveland, CO 80538-9680
Hilgendorff, Patricia, 73 Elizabeth St, Basking Ridge, NJ 07920-2707
Irving, Gregory F., 318 Gray Ave, Waverly, VA 23890-5021
Izenour, Tessa, 7 Merganser Way, Colchester, VT 05446-6634
Jarrell, David, Perennial Obsessions Nursery, 13720 Jerusalem Hill Rd NW, Salem, OR 97304- 9603
Jaynes, Craig, 6599 Old US Route 35 E, Jamestown, OH 45335-9774
Jones, Carolyn, 65 Fairview Ave, Belmont, MA 02478-3763
Kelley, Melanie, 103 Whitson Rd, Gray, TN 37615-3315

Klein, Saya, 1710 Maple St, Vancouver, BC V6J 3S6 Canada
Leith, Carolyn, 1601 Halifax Rd, Chapel Hill, NC 27514-2730
Lin, Doris, 108 Elmwood Rd, Baltimore, MD 21210-1918
Mackintosh, Amy, 1439 Dixie Tr, Raleigh, NC 27607-6732
Majorelle, Marni, 130 Diamond St, Brooklyn, NY 11222
Malisch, Susan, 373 Carlston St, Richmond, CA 94805-2417
Marx, Laura, 102 Houslow Ct, Cary, NC 27518-9069
Moore, Brenna, 50 Mount Hope Blvd, Hastings on Hudson, NY 10706-2411
Mueller, Marailynn, 3857 Vallejo St, Denver, CO 80211-2153
Myhre, John, 1005 Park Ave, Garner, NC 27529-4163
O'Brien, Ben, Wild by Design, 3070 County Rd 8, Picton, ON K0K 2T0 Canada
Plant, Ruth, Yew Tree Cottage, Long Lane, Haughton STAFFORD ST18 9JR United Kingdom
Podilchuk, Martha, 1576 Valley Rd, Millington, NJ 07946-1604
Pratt, Sam, Conifer Kingdom, 6450 Brush Creek Dr NE, Silverton, OR 97381-9378
Prince, Diana, 730 Wildwild Rd Apt 206, Mahtomedi, MN 55115-2288
Rondeau, Hawkeye, 37 Sunnyslope Ave, San Jose, CA 95127-2446
Rose-Erickson, Laura, 206 Brown Blvd, Rothschild, WI 54474-1116
Rose, Barbara, 10124 Homar Pond Rd, Fairfax Station, VA 22039-1651
Roskoph, Zane, 1120 Garfield Ave, Cherry Hill, NJ 08002-1056
Sacharoff, Samuel, 510 E Locust St, Centralia, WA 98531-4142
Schremser, Matthew, 3285 Sandcrest St SW, Grandville, MI 49418-1477
Selong, Jason, 766 Appalachian Dr, Boone, NC 28607-4369
Simmons, Christine, 1722 Colony Dr, Reading, PA 19610-1102
Smith, Holly, Asarum Studio, 17 Hawthorne Ct, Brandenburg, KY 40108-7032
Smith, Paul, 5602 8th Ave NE, Seattle, WA 98105-2747
Smith, Steve, 720 Oxbow Rd, Orange, MA 01364-9559
Stafford, Marion, 176 Call Rd, Colrain, MA 01340-9507
Stephens, Wayne, 1612 Oberlin Rd Apt 5, Raleigh, NC 27608-2045
Stier, Pat, 1448 Brown City Rd, Imlay City, 48444-9445
Swift, Joe, 4802 Hickory Glen Dr, Matthews, NC 28105-2859
Switzer, Russ, 229 29 St, West Vancouver, BC V7V 4M5 Canada
Thompson, Debi, 221 Magnolia St, Denver, CO 80220-6009
Thornber, Michael, 19 Heyhead St, Brierfield, Nelson, LANCS BB9 5BN United Kingdom
Tonthat, Myhanh, POB 602, Sugar Land, Fort Bend, TX 77487-0602
Townsend, Sara, 47 Clark St, Belmont, MA 02478-2449
Wang, Michael, 16 Shadyside Ave, Nyack, NY 10960-4816
Windecker, Myrna & Vickie Danielsen, 2735 S Pennsylvania St, Englewood, CO 80113-1643
Yu, Jerry, 418 Chime Ct, Cary, NC 27519-5581
Zweig, Debra, 85 East Shawnee Tr, Wharton, NJ 07885-2924

FOR SALE: A BEAUTIFUL MATURE GARDEN and 2400 SQ.FT. HOME, ON 6.3 INVESTMENT ACRES, $1,200,000.00

In the City Limits of Medford, Oregon, surrounded by the botanically rich Siskiyou Mts. and Southern Cascade Mts. Former home of Siskiyou Rare Plant Nursery, 1978-2005. Includes a large Josef Halda crevice rock garden, huge collection of mature, choice trees and shrubs, rich soil and abundant well water. Contact Baldassare Mineo for full announcement at italio@hotmail.com

NARGS Chapters (meeting place/area) and Chairpersons or Co-Chairs

Adirondack (Ithaca, NY)	John Gilrein <basecamp@alum.syracuse.edu>
Alaska (Anchorage & Mat-Su Valley)	Florene Carney <snowfire@mtaonline.net>
Allegheny (Pittsburgh, PA)	David Amrheim <amrheindav@aol.com>
Berkshire (Stockbridge, MA)	Joyce Hemingson <jhem1022@gmail.com>
Calgary Rock & Alpine Garden Society (Calgary, AB)	Patti O'Keefe <president@crags.ca>
Columbia-Willamette (Portland, OR)	Terry Laskiewicz <fritillaria_3@hotmail.com>
Connecticut (New Haven, CT)	Virginia Gingras <ginnygingras2013@gmail.com>
Delaware Valley (Philadelphia, PA)	Janet Novak <janet@indri.org>
Fells (Newbury, NH)	Thelma Hewitt <thelmakh@gmail.com>
Gateway (St. Louis, MO)	Sandy Evertowski <evertowski@centurytel.net>
Great Lakes (Southern MI)	Holly Pilon <plantscape_design@yahoo.com>
Hudson Valley (Westchester Co, NY)	Don Dembowski <dondembowski@optonline.net>
Long Island (Oyster Bay, NY)	Donald Ohl <donohl@yahoo.com>
Manhattan (New York, NY)	Brendan Kenney <ny10014@aol.com>
Mason-Dixon (Norrisville, MD)	Marika Sniscak <marika123@verizon.net>
Minnesota (Minneapolis/St. Paul, MN)	Rick Rodich <rrodich@juno.com>
New England (Waltham/Boylston, MA)	Vivien Bouffard <vbouffard55@msn.com>
Newfoundland (St. John's, NL)	Todd Boland <todd.boland@warp.nfld.net>
New Mexico (Santa Fe/Albuquerque, NM)	Robin Magowan <magowanrobin@gmail.com>
Northwestern (Seattle, WA)	Kevin Cretin <kcretin @yahoo.com>
Nova Scotia (Halifax & Truro, NS)	Roslyn Duffus <roz.lakeside@gmail.com>
Ohio Valley (OH & surrounding states)	Joan Day <jdayham@earthlink.net>
Ontario (Don Mills, ON)	Arie Vanspronsen <arie.v@sympatico.ca>
Ottawa Valley (Ottawa, ON)	Jeff Hurtig and Jane Lund <president@ovrghs.ca>
Piedmont (Raleigh, NC)	Amelia Lane <amelia.lane@gmail.com>
Potomac Valley (Alexandria, VA)	Kevin McIntosh <kmac53@verizon.net>
Québec (Montreal, QC)	Réné Giguère <apulsatilla@netscape.net>
Rocky Mountain (Denver, CO)	Kathleen Stewart <kcstewart1568@yahoo.com>
Sierra (Sonora, CA)	Nancy Piekarczyk <NanPiekarczyk@gmail.com>
Siskiyou (Medford, OR)	Jean Buck <buckjean11@yahoo.com>
Wasatch (Salt Lake City, UT)	Tony Stireman <tstireman@gmail.com>
Watnong (Far Hills, NJ)	Michael Wilson <miwilson@ramapo.edu>
Western (San Francisco Bay area, CA)	Ted Kipping <tkippingsprint@earthlink.net>
Wisconsin-Illinois (Madison-Chicago)	Damon Smith <damonsmith@hotmail.com>

NARGS Structure

The officers of the North American Rock Garden Society consist of a president, a vice-president, a recording secretary, and a treasurer. The officers are elected by the membership.

The Board of Directors of NARGS consists of the four above-named officers, the immediate past president of NARGS, and nine elected directors.

The affairs of NARGS are administered by an Administrative Committee (called AdCom) consisting of the president, vice-president, recording secretary, treasurer, and one director-at-large, selected annually by the NARGS officers from among the nine elected directors.

Officers

President	Betty Anne Spar <bettyannespar@gmail.com> 5051 N Grey Mountain Trl, Tucson, AZ 85750-5942
Vice President	Don LaFond <plantjunkies@gmail.com> 11836 McGregor, Pinckney MI 48169-9517
Recording Secretary	Joyce Hemingson <jhem1022@gmail.com> 44 Rock Hall Rd., Colebrook CT 06021-7072
Treasurer	Richard Lane <rhlane01@gmail.com> 4904 Hermitage Dr., Raleigh, NC 27612-2762
Director-at-Large	Panayoti Kelaidis, 1244 S Quince St., Denver, CO 80231-2513 <telesonix@outlook.com>
Immediate Past President	Matt Mattus <mmattus@charter.net> 26 Spofford Rd., Worchester, MA 01607

Directors of the Board

2016–2019	Dave Brastow, Tumwater, WA Julia Caroff, Birmingham, MI David White, Durham, NC
2017-2020	Panayoti Kelaidis, Denver, CO Marianne Kuchel, Fairlee, VT Steve Whitesell, North Blenheim, NY
2018-2021	Mariel Tribby, Saint Louis, MO Michael Guidi, Denver, CO Judy Zatsick, Fairfax Station, VA

Managers

Executive Secretary	Bobby J. Ward (919) 847-6374 P.O. Box 18604, Raleigh, NC 27619-8604 <nargs@nc.rr.com>

Back cover: *Trachystemon orientalis*. Panayoti Kelaidis

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