

Bulletin of the  
American Rock Garden Society

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NO. 1

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## Foreword

This issue of the Bulletin has a number of changes which are worth mentioning. The size is slightly different, which comes from being printed on a small web press. The efficiencies gained by this process have allowed us to add 16 pages to the Bulletin. In addition, we have re-introduced color to the inside providing an additional 4 pages. We hope you like this expansion.

Editorially, you will find three pieces on the Pine Barrens which will be an important part of the schedule for this summer's annual meeting in Wilmington, DE. The spring issue will include articles on native plants at Mt. Cuba Center and the Rock Garden at Winterthur, both scheduled for tours during the annual meeting. We hope these whet your appetite for this well-planned event.

We have gone farther afield, too. In addition to articles from both coasts and points between, you will find a discussion of seed germination by a seedsman from Germany and an introduction to the terrestrial Calanthe Orchids of Japan. And one man's personal viewpoint of rock gardening through the year begins with this issue — as Geoffrey Charlesworth looks at the Rock Garden in Winter.

Ted Marston,  
Editor

The cover illustration is a woodcut of *Gentiana cucinata* from *Raviozum plantarum historia*, a famous herbal by Carolus Clusius. It was published in 1601,

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## Calendar of Coming Events

Eastern Winter Study Weekend (Allegheny Chapter)

Pittsburgh Hilton ..... January 27-29, 1989

Western Winter Study Weekend - Vancouver, B.C.

(Alpine Garden Club of British Columbia)

Richmond Inn ..... February 24-26, 1989

Annual Meeting (Delaware Valley Chapter)

Radisson Wilmington Hotel ..... June 16-19, 1989



# The Rock Garden in Winter

Geoffrey Charlesworth

Winter! A word to put rock gardeners on hold. We spend three months of the year preparing for it starting with the first chilly night in September. An alarm goes off inside the brain and muscles: we start thinking 'cleanup', 'plant out', 'edge', 'turn compost' and the muscles react to this sense of urgency. When winter arrives — let's say around Thanksgiving — there is a sense of fulfillment alternating with a sense of resignation, a feeling that what wasn't done doesn't matter, that snow will soon be here to hide the sins of omission.

The garden itself is at rest even when howling winds sweep down from the northwest to set the stems of *Calamagrostis epigeios* shivering and genuflecting to the tyrant from the arctic. If there has been a silent powdery snow the remains of *Sedum spectabile* sit crowned with a powder puff. Some plants are as beautiful in death as they are in life. I don't choose any specifically for this reason though, I just accept the serendipitous when and where it happens. There are very few days of winter when you look at the details of garden. Winter is the time to look at the overall effect, the paths, the rocks, the placing of

shrubs and conifers. There isn't much you can do except dream and plan and promise, threaten and boast about what you will do once the ground thaws. It is the best time to cut down the trees that you carefully banded in the summer. When Spring arrives you will be delighted with the new light and the extra space; you never want a tree back that you decided to remove.

After the first serious snowstorm — probably in early January — even tidying up stops, and anything loose has already been blown away and buried. A coldframe, its lid broken and crumpled, is embalmed in ice and shrouded with a white winding sheet. I try to forget which plants are buried under the debris, there is no point in anticipating a special calamity, there will be plenty of losses to bemoan in April.

But of course all this is Winter in a rather high exposed patch of New England. It may be happening in Minnesota too. But many gardeners have very different winters. One of the pleasures of Study Weekends is to visit other people's gardens and experience vicariously what it would be like to garden in a different part of the country. Even if a



garden is under snow you can enjoy this activity. We saw Anita Kistler's romantic, rocky slope in Pennsylvania with a white veneer hiding plants but not obscuring the contours. The high spot though was escaping into the shelter of a cross between a coldframe and an alpine house where a multitude of plants were wintering over, protected from the worst of the weather but without heat. It gave a feeling that gardening was still possible even in late January. Further south in Virginia, Pam Harper's shoreside garden at the beginning of January, was quiet but not completely dormant. *Narcissus bulbocodium* was already in bloom and the first crocuses had already opened. Later that winter there were bad storms but at the time we saw it, the garden was a patchwork of Fall maturity — this is essentially a shrub garden with berries and some lingering foliage — Winter hiatus and Spring promise.

In North Carolina at the southern end of the Blue Ridge mountains Ev Whittemore has made a garden at the top of a steep, adventurous road — almost paved over what was once a mine field of bumps and ruts. Here there is almost no winter of the Massachusetts kind. Ev gardens nearly every day of the year. It is still a garden without bounds, parts almost mature, parts roughed in and 'in prog-

ress'. The oldest part is a scree of large gauge stone with larger rocks for interest and scale. The closest I have seen to a facsimile of high Colorado tundra. Nothing much in bloom in mid-December but the mats and buns are contented and a healthy size. Nearby coldframes are open to the sun. They only need cover on a few days of the year. Ev sows a lot of seed and a tour of the seed pots is enthralling. Living in North Carolina means Ev can sow seed as soon as she gets it and leave it outside to germinate. Well, so can I, but there is no added value to sowing seed in November over February for me except not to fall behind. Ev gets the added pleasure of getting germination throughout Winter. Inspecting and transplanting never stop. I looked at her setup with a little envy but remembered too that I wouldn't have left my own garden if I had had so much activity and it was only because my garden was immobilized that I was there at all.

In February in San Diego you can eat oranges from your own tree. We saw gardens there like a greenhouse without walls. Gardeners all over North America seem to push plants to their limit of hardiness and even in San Diego use protected places and glass to grow the ungrowable. But there are probably no rock gardens this far south. In San Francisco, on the other hand

there are rock gardens of many styles. Ted Kipping's steep arena manages to combine scree, bog, sand garden and rocky slope in an enclosing curtain of shrubs and climbers. Nell and Bill Folkman have a small garden that seems to flow out of the house, or is the garden invading the living quarters? The trellises and structures and the intensive use of every inch of ground creates a box-like bower. That is until you go out to the front of the house and see a rock garden that almost overflows on to the sidewalk, in February these gardens are full of action. Barbara Stevens' city garden is high in San Francisco. Some of the basic problems of city gardening are there to be solved: What to grow and how much space to allow for it; when to remove an overgrown resident. We all have dilemmas of permissiveness and ruthlessness, luxuriance and waste. Sometimes we must steel ourselves into parting with a good friend that spoils the scale of the design. In the city this dilemma is magnified and complicated by the problem of getting rid of unwanted material. No room for the sprawling compost heaps I have in Massachusetts; no infinite woodland where twigs and thorns and woody trash can be dumped. A city garden is a stage set and every detail has to count. So it is in this San Francisco garden.

Almost an anomaly is Harland Hand's beautiful and original garden. His summer weather is so friendly — enough fog — and his winters are so mild that his rock plants are orchids and his ground cover Echeveria. With more typical local climate is Wayne Roderick's steep woodland with Calochortus and other impossible bulbs. California gardens force you to reassess your view of what a rock garden is and stir up vaguely disturbing feelings that one is wasting one's time in the East. The climax of this discontent comes at the bulb heaven of Stan Farwig and Victor Girard. Not like a garden at all, more like an open air alpine house with bench after bench of pots of the world's most beautiful bulbs. Mostly southern African of course. We think ourselves very clever to grow a few *Rhodohypoxis* or an occasional *Gladiolus*, but they have a feast of color in late February that matches our May display.

Even in Seattle and British Columbia rock gardening in winter is a different story from the bleak prospect of the Northeast. But here you have the feeling that growth has slowed down and there is a static quality to the landscape. In early March Betty Lowry's model garden has its first touch of color but the rush is yet to come. People seem to be waiting just as we are in the East, but they have non-stop



pleasure watching their charges. They can do the cleanup in a leisurely way. So it seems. Fall in the Northwest must be a very relaxed time. You know that nearly anything can be put off until February! But the Minnesotans must share our rush into winter. Their gardens in winter are like ours - on hold.

Still there is plenty of interest in a New England or Midwest gardening life from December through grim March, and we are always glad to return to the snowfields. The seedlists and catalogs have to be read and order sheets rushed to the mail. Seed has to be sown when it arrives and the pots put out in trays in the snow. Have you noticed what happens when you give a plant to a visitor? There is a sudden change of attitude towards the plant. When they arrived it was standing in the sun waiting patiently for the next rain, it had spent the past two months in this position and, as the visitor must have observed, was flourishing. Now you give it to your friend and instantly they want to water it and remove it to a shady spot. They reverently but censoriously remove a little moss growing in the pot and ask a torrent of questions about size, color, flowering time, hardiness and so on. A similar fit comes over me when I receive seed. It must get immediate attention — listening, labeling, sowing in

three inch pots, mulching with sand, overnight immersion in an inch of water and not until it is safely out in the snow ready for its first overnight freeze and its name entered on the computer as well as in my log book can I relax. This is true even though I know the seed has been sitting in an envelope in a shoe box since August. The sooner the seeds imbibe and start on their long journey from dormancy into planthood the better. I do restrain myself from sowing annuals too early though. Nothing is more vexing than to have to transplant seedlings into individual pots in March when there is no room in the greenhouse to spare and all the coldframes are full. So it is probably a good idea to sow fast germinating annuals in April or even May. In New England you don't want to plant them out until the beginning of June at the earliest; even the hardy ones don't really like frost. You may be thinking why even discuss annuals in this context. I will merely mention *Lupinus lepidus lobbii* which behaves exactly like an annual, though I don't believe it is annual on Mt. Hood. Anyone would be happy to see it blooming its first summer after sowing and overjoyed to have it set viable seed.

Nor is Winter an unbroken period of steady state. There are warm days as well as those glorious frigid blue days. On 'warm'



days there is pruning, sawing and trash burning. If there is an extended period of warmth or, Heaven forbid, a warm rain, the snow may vanish for a few days and the top inch or so of the soil unfreeze. You rush for a spade and jar your knee as it hits the frozen subsoil. How about weeding? A claw seems possible. Well you have to be lucky to hit on a good place to start — most places the roots are firmly iced in and the best you can do is behead a few weeds and maybe sprain your wrist hitting hard ground.

Mostly Winter is making lists, organizing slides, reading, writ-

ing and remembering. Gardening is still a process — a mental process. We can sometimes escape into other people's realities — those people who live where frost is rare and snow ephemeral. There is little point in debating which location is best. Gardeners make gardens anywhere plants will grow.

*Geoffrey Charlesworth, Sandisfield, MA, is the author of The Opinionated Gardener and contributes frequently to the Berkshire Chapter Newsletter. He has agreed to contribute his thoughts on each of the seasons in the rock garden.*

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## Found: *Fritillaria ojaiensis*

Laura Jezik

Over the years several "mystery plants" have beguiled us frit nuts. Among these are *F. adamantina* of Diamond Lake in Oregon, found once and reportedly never seen again; *F. coccinea* and *F. Gentneri*, both variants of *F. recurva* but difficult to isolate from that species; and most mysterious of all, *F. ojaiensis*. The last named plant was described by Davidson in the early 1920s from the region around Ojai, California. Like so many of these mystery

frits, it was found and then quietly slipped from our grasp and for many years was not seen or reported by anyone. Its very existence became questionable. Christabel Beck, who wrote the book on fritillarias, mentioned it but dismissed it as probably merely synonymous with *F. lanceolata*.

For years I thought about it along with all other mystery frits. And over the years I found all the others, but this kept eluding me. Most frits, however

mysterious, probably still exist, since frits seem to manage to survive, even prosper, whatever the odds may be.

Then, without my knowing it, about 2 years ago two Southern California botanists found it again. I learned of it in my search this spring, and I knew I must make a stab at finding *F. ojaiensis*. I contacted the botanists who told me about two stations of the species, and I was soon on the road again looking for my frit. They informed me that it is alive and well, growing in more than twenty colonies near Ojai.

One of these stations is up a shale slope, close to a road. The other, the type station, was a long hike on an old trail whose place names have changed over the 60 some years since the species was discovered.

I selected the close-to-the-road location first. At that time I was having my second relapse of what was then considered to be Hong Kong flu. The doctor had told me to stay home and rest. I assumed he would find chasing fritillaria a restful pursuit and drove the nearly hundred miles to the roadside site.

It sure was a shale slope! The shale (almost scree) was resting at the angle of repose. One degree higher and it would fall down to the maximum angle. The slope had a number of oak and *Umbellularia californica* trees,

several shrubs, and a favorite companion of fritillarias: poison oak.

I started up the slope. It was the classic two steps struggle up and three steps slide down the hill, with one or more interesting slides down.

I crept upward, struggling to safely reach the uphill side of any given tree, resting, deciding on the next strategy of assault, then struggling upward, losing ground from time to time, but resting and beginning again slowly getting to within 20 feet of the top of the slope. Looking up to the last slope with the sun receding and reducing the light for photography and realizing there was not sufficient light to draw pictures of anthers and styles and whatnot, slowly but surely Laura J. gave up without reaching the top.

I soothed my disappointment by saying I would go for the hike to the type site. I went home, discouraged, thinking maybe a chapter of my life had ended, thinking maybe I would have to depend on others to chase up hill and down dale to find frits, thinking sad thoughts, and feeling rather fluish. I had forgotten I was supposed to be resting in bed.

Next day, I stayed in bed. Laura J. is nothing if not a good patient. After one day of my antibiotic and nursing my

bruised ego, my enthusiasm came back, and I started out again, this time earlier in the day.

The type location is at a campground near the end of an old trail, one that has been on the maps since 1900. However, the place names have changed. Rock slides have wiped out parts of it. There were very few trail markers. In addition, I started searching for my frits as soon as I reached the first likely habitats. So I inched slowly forward as the day passed. I hiked at least 3 1/2 miles in and saw much evidence of places where years ago the river had washed out its whole valley. The regrowth was very well established with small trees and full vegetation. I wondered if my frit had washed out as well.

The day waned and again I gave up, not knowing if I was still on the trail, not knowing if I had passed by the habitat and missed the frit altogether, not knowing if I would ever find it at all. My source had said these were the two easy locations and both had defeated LJ. Defeat not only looked like a possibility, but maybe an inevitability. I felt fairly fluish again, though religiously taking my antibiotic all day.

In a dim and sad mood I started to hike back. Part way there, while putting on my shoes after wading the river, some dogs

arrived along with their master. From him I learned that 1) it was 107 degrees F., and 2) the campground was 7 miles up the trail. I had gone only half way. Disappointment was heavy, and I trudged back to my car, alarmed at the news of the heat wave. I feared it would finish off the flowering and I would have to wait another year to get my frit.

Thinking glum fluish thoughts, I went slowly home. I decided to try one more time. With a sort of last hope, I called the botanist again.

The answer was simple. I had gone too far up the shale slide the first trip. My frits were only part way up and to the right. My spirits skyrocketed. I was off again. Oddly enough, my flu was fast abating and I felt rather well which proves that chasing frits will cure viral infections. So Sunday, early on, I was at the scene. Up I went again, switchbacking, trying to make more progress surging upward, then sliding downward. Eventually, I got high enough to attempt a lateral move to the right.

All appeared to be going well. I avoided poison oak plants, I thought, and reached the comparative safety of the scrubby trees. At least now I was safe from tobogganing down to the highway. And suddenly, as I worked my way downhill, I was



among my frits. There were hundreds of them. Most of them were in their resting leaf stage, with only the wide, flat leaf indicating the presence underground of a frit waiting for the right year to bloom. But what was above ground and blooming was enough to please me. This is a true species, not one of the variants we frit nuts have thought it might turn out to be. There is nothing like a plant disappearing for 60 years after its discovery to bring out the speculative streak in the amateur botanist. This frit had been linked with *F. lanceolata* and other frits during its long sojourn in mystery land.

*Fritillaria ojaiensis* is rather lovely, a light golden yellow in the sun, a cool greened yellow in shade, both spotted with red to maroon. It is about 75 to 90 cm tall, with two to three whorls of linear cauline leaves, each leaf about 15 mm wide and up to 14 or so cm long, some, scattered above the whorled leaves. The raceme of 5 to 14 pedicelled flowers, each pedicel subtended by a leaf-like bract, was in many specimens arranged in an ascending spiral, clockwise from bottom to top. Perianth segments are 18 to 19 mm long, with a depressed oval nectary 5 mm long by 2 mm wide having an elongated green-veined insect guide path. Each perianth segment is tipped with an apical

tuft of hairs appearing to be glandular. (This is a characteristic of every American fritillary I have ever seen.) The style is trifid, united for 2 to 4 mm, then widely spread for 6 to 8 mm, totalling 1 cm in length. Filaments are 1 cm long; all anthers seen were yellow. Bulbs are of several loosely arranged scales with a few small bulblets loosely attached, not rice grained as in some "woodland" species.

This plant is not related to any other frit I have seen in America, and I have had specimens of all the species. It is most definitely not *F. lanceolata*, nor is it any of the multiflora/macrantha types. There is very little variation within the stand. It seems to have evolved by itself. Geographically, the nearest other *Fritillaria* species are *F. biflora* and *F. pinetorum*, both within a hundred miles, but it resembles neither. Many of the flowers are sterile, having no styles; possibly they are sources of pollen. I will go back to see ripe capsules in a few weeks.

While sitting there thinking profound frit thoughts, I noticed several things. For one, there were lots of very small flies hovering around my exposed arms. They didn't appear to land on me. I felt no bites. A bit down the hill from me was an interesting stand of *Acer macrophyllum*, the broad leaf maple. This native of the Pacific

Northwest appears in a few riparian woodlands in Southern California; it seems to be a relic from times when the Northwest flora was wide-spread. I had also noticed it on the trail to the type station, another riparian woodland. Other plants that reminded me of the Northwest were something that looked like cascara, a local alder, some polypodies, and a few others. It is interesting to speculate on the occurrence of this fritillary in the same habitat as this out-of-place Northwest flora. One can hypothesize that the frits came over the land bridge early on and migrated southward. Another theory is that the action went the opposite direction. Therefore, are the fritillaries farthest from the Bering Strait the ones which have come furthest and are consequently the oldest? I believe fritillaries are an evolving species, fairly new to the scheme of things, or at least they are obviously speciating as we sit and watch them.

Thus came the end of a happy and somewhat typical frit experience. Historically, I have lucked out only about twenty-five per cent of the time. But from these trips I had photos, drawings and the beginnings of a painting, and my flu seemed to have gone altogether.

I rejoiced too soon. The next day there were spots on my arms that itched like crazy. I thought

that it must be poison oak. It turned out, though, that those little fly-like bugs I had seen hovering about were gnats, and gnat bites are a new experience for me.

Several weeks later I returned for a look at the capsule. It was found to be reasonably typical of certain American fritillaria capsules: prominently winged, perhaps one might say starlike in horizontal cross section. However, it is very different in its much reduced vertical dimension (shaped roughly like a hollyhock capsule short and wide). In vertical cross section the capsule is not longer than  $3/4$  cm, making it the shortest of any American fritillaria.

The seeds were just short of ripe, but they ripened later in water laced with a bit of sugar, water and sugar changed often for freshness. I ended with a quantity of seed. For those who are interested, I had neither accidents, falls, slides, or bug bites on this second trip.

*Laura Jezik, Los Angeles, CA, transplant from the Pacific Northwest, is president of the Southwestern Chapter of ARGS.*

# Phabulous Phloxes

Panayoti Kelaidis

## Creeping Forms for the Garden

Late April and May are synonymous with phloxes in the rock garden. These are invariably hybrids of *Phlox subulata*, the commonest mat-forming species growing wild along the eastern seaboard. Discriminating rock gardeners have sought cultivars with more vivid flower color or some special quality of form or habit, but it's surprising how few of these are available from more than a handful of specialist nurseries, and even extensive rock garden collections sometimes lack the better forms. Judging from most rock gardens in America, the numerous species and endless variations of creeping phloxes that are found west of the Mississippi are largely figments of the late Dr. Wherry's imagination.

## Eastern Creeping Phloxes

The first phloxes to be introduced to cultivation were naturally the eastern species that grew wild where America was first settled. Reginald Farrer has written that: "The day that saw the introduction, more than a century since, of *Phlox subulata*, ought indeed to be phloxes that occur to the east of

the Mississippi. *Phlox brittonii* has tiny, needle-like leaves that form wide cushions resembling the common creeping phlox, only the flowers have slightly cleft petals. It is mostly commonly cultivated in a form called 'Rosea', often sold as a botanical variety. The cleft petals are taken to great lengths in the cleft phlox of the Midwest, *Phlox bifida*, to the extent that they appear to have ten narrow petals, rather than five wide ones, in some forms. The foliage on cleft phlox is much longer than any other creeping phlox, and the plants do not root as they creep, but come from a central stem. In nature cleft phlox is usually found on very sandy soils, and it can become a pest by self-sowing on the scree in the rock garden. It produces seedlings abundantly on the fellfield section of Denver Botanic Gardens, varying from pale platinum-blue shades to quite dark stars. The darkest purple-lavender form I have ever seen was growing among countless hundreds of cleft phlox in the rock garden of Betty Blake in southern Michigan: it has flowers a trifle smaller than other forms, and the plant stays rather compact as well. It was distinct in enough characters



that I believe it deserved to be recognized with a cultivar name, and Homer Hill greenhouses and Colorado Alpines have sold this under the cultivar name 'Betty Blake'. Mina Colvin, a well known plants-woman from Indiana, first introduced the tiny flowered cultivar 'Starbrite', with its clouds of tri-colored flowers. She is commemorated in 'Colvin's White', the best known selection of an albino cleft phlox currently in the trade.

There are two showy hybrids with vivid lavender-blue flowers that suggest some *Phlox bifida* ancestry. *Phlox* 'Mill-stream Jupiter' occurred at the Fosters' famous Connecticut garden, and has strong lavender flowers with dark markings near the eyes and only shallow toothing. It roots slightly along the stems, and has shorter leaves than the ordinary cleft phloxes. *Phlox* 'Boothman's Variety' was presumably named for Stuart Boothman, a famous English nurseryman active earlier this century. It has good blue flowers with very dark eyes that make quite an impression. It has rapidly spreading deep green leafy stems typical of subulate phloxes. This is occasionally offered as a form of *P. douglasii* - surely an example of British humor. The real Douglas phlox is restricted to the mountains of the Pacific Northwest and bears little resemblance to this or virtually

any other plants bearing its name in European nurseries.

The last commonly grown eastern creeping phlox is *Phlox nivalis*. This grows wild further south than other creeping phloxes. Most of the year it looks rather similar to the common subulate-type creepers, but when it comes time to bloom it produces a stem 3-4" tall (rather like *Phlox stolonifera*) with a handsome cluster of flowers that are usually over an inch in diameter. For years, the only form of this phlox in cultivation was a British selection called 'Camla', but practically anything under the name *P. nivalis* is sure to produce a showy, bright pink flowered plant. This is the only eastern phlox I find to be a trifle tender. Many shoots show tip damage every winter and look unsightly until bloom time when new growth will usually cover up the browned off leaves. It would be well worth selecting plants of this phlox for greater sun and cold tolerance.

### **Western Creeping Phloxes**

European gardeners are mystified and often annoyed that so few species of Western phloxes are grown in their gardens. When they finally come to America and see that much of the Western landscape is made up of a vast, continuous mat of tiny, cushion phloxes they are dumbfounded. How could plants so common in nature be virtually

absent from gardens? I wonder too.

Of course, many Western microphloxes are dryland plants that may not like to grow in wet climates. This should certainly not be a problem in gardens throughout the continental parts of the country, and yet one rarely finds native phloxes here either. Since our native creeping phloxes sometimes occur by the million (most of the states of Wyoming, Utah, Nevada and Idaho are actually held together with an un-interrupted mat of *Phlox hoodii*). If I didn't fear eternal retribution for promoting vandalism, I might suggest that this species would be an ideal subject for gardeners to seek out in bloom and take short cuttings, or even rooted pieces of superior forms so that it could assume its proper place in gardens as harbinger of spring for the phlox family. *Phlox hoodii* is the first to bloom in nature or the garden, usually coming into peak bloom in March. The commonest forms are pure white, although blush pinks and even lavenders occur in Idaho and other lucky states. The flowers are quite variable in size and shape as well, although the plant is always quite diminutive. It occasionally forms very tight cushions that are magnificent in troughs, although it can spread several inches a year from tricky, subterranean rhizomes.

*Phlox andicola* is found to the east of Hood's phlox, on sandy areas in the Great Plains. This is the one Western phlox I would nominate as a potential hazard: it forms a dense tangle of underground rhizomes that can spread up to a foot a year on sandy soil or scree and quickly inundate a bed. The flowers are invariably pure white stars with clearly visible yellow stamens that positively glow in contrast. It can be found as far south on the Great Plains as the Pawnee Buttes north of Denver, although it is much commoner in the Nebraska Panhandle northward over the Great Plains. *Phlox allysifolia* is another sand-loving phlox with a similar range in nature that adapts easily to the dryland garden. It has short, broad, deep green leaves and very full round white blossoms. When established it too can spread widely from underground rhizomes. Both this and the previous species were first widely distributed by Claude Barr, and at least one famous Pennsylvania garden still has thriving colonies of these ramping through sand beds.

*Phlox multiflora* is especially common in the foothills around Denver, although this Front Range form seems to be disappointing in the garden. The plants form rather lax cushions and the pink flowers are just too sparse. Further west, in North

and Middle Parks, this species is a dominant ground cover in the sagebrush meadows. Here it forms flat pancakes with heavily blooming mounds of white or pink that are deliciously fragrant. Has anyone tried growing these? When tamed, they will be among the most showy rock garden flowers.

Eight years ago, Paul Maslin and I took cuttings of good lavender forms of *Phlox pulvinata* in the Snowy Mountains of Wyoming. We returned with these to Colorado, rooted them and proceeded to grow them in the Rock Alpine Garden for several years. Placed in too hot a spot, one by one they gradually dwindled, and would have been lost if Andrew Pierce hadn't taken a piece to his home in Evergreen. Andrew's specimen is quite famous now, and many of us have admired his giant mat that seems to cover itself with bright lavender flowers several times during the growing season - notably when Andrew's garden is on tour. He has shared cuttings of this plant far and wide, and we are once again growing this vigorous form of our showy and deliciously scented alpine phlox. *Phlox missouliensis* is closely related, with longer, hairier leaves and icy blue flowers for a long season in the spring. This has proven permanent and easily grown in sunny scree soils. The Missoula phlox is sometimes

listed as a subspecies of *Phlox kelseyi*, a very widespread phlox with coarse blunt leaves that specializes in growing among grass and sedges in some of the least hospitable alkaline cattle wallows throughout the intermountain west. Jeanne Anderson has succeeded in taming Kelsey's phlox in her Idaho Falls garden.

*Phlox condensata* is the commonest alpine phlox in Colorado. On Hoosier Pass this can form rock hard cushions with dark eyes to the pure white blossoms. Who will finally tame this majestic native alpine? Or introduce the dark rose pink forms of *Phlox austromontana* and *P. jonesii* that are quite common in parts of southern Utah and Northern Arizona? There are a dozen or so desirable species, and countless variations.

One day soon let's dream that we may find named forms of this or that Western phlox in local garden centers alongside the brightest and best Easterners. Our Western natives possess two sterling qualities to recommend them: most are quite drought and heat tolerant and will put up with any native soil you might have in your garden. And all our Western native phloxes seem to have a rich, heady fragrance somewhere between jasmine and heaven.

*Panayoti Kelaidis, Denver, CO, is curator of the Rock Alpine Garden, Denver Botanic Garden.*



# Verna Propinqua

Kathie Lippitt

You wouldn't tell a Boston native that he got a Z- in pronunciation because he referred to his father as *Fah-tha*. How many of your friends from Georgia have you stopped in mid-sentence to explain that the word is *Georgia* with an *r*, not *Geohgia*? Or to Westerners do you say, "Wait a minute. You forgot the final *g* in *goin'*?" Of course not. You would say, "That's part of their regional accent. Everyone from their part of the country talks like that." We all speak English, we emphasize the same syllable, we can all understand one another. Or can we?

The first time you heard a southerner talk about a pahty, were you sure what he meant? I'm from the West with its runnin', jumpin', and hollerin' around and you shur didn't understand my accent the first time you heard it, either. After many, many repetitions of the same phrases, we take them for granted; we overlook them.

If we have all this trouble with English, how can we manage Latin? Even more distressing than the pronunciation of the vowels in Latin names can be the falling of the syllable. It

shouldn't bother us any more than an Englishman's labor'atory. Is our lack of familiarity with spoken Latin what makes us listen to ourselves and others so critically?

Latin has survived through the centuries not because it was musty and needed to be pronounced correctly to keep it alive. It has been a changing language; certainly you have heard of New Latin, Vulgar Latin, and Bastard Latin, to say nothing of Taken from the Latin. In this day and age, we can call it nothing but Free Latin. It should be used, pronounced without concern. Just pronounce it. If you want a standard to go by, use American pronunciation, or if you have had a foreign language, pronounce it like the foreign language. Don't ignore any letter. Listen to yourself saying it, then it won't frighten you when you are trying to interest a group in growing a beautiful blue gentiana and you hear a voice coming out of you saying, "*Gentiana septemfida latifolia*."

Since your time is no longer spent hesitating over pronunciation of Latin names, you will have more time to

wonder about their meanings. If you have ever seen a list of the many species of gentians, you will sympathize with the botanists who took on the job of naming them. How would you go about characterizing a gentian in only one or two words? Here are some ways they have done it:

1) The place where it was found: a country, as in *cachemirica* (Kashmir); ecological features, as in *montana* (growing on a mountain) and *pyrenaica* (Pyrenees); climatic zones, as in *alpina* (above timber line) and *alpestre* (almost alpine)

2) The name of a person: he who found it, a friend, a botanist, or he who led the botanist to it; as in *farreri* (honoring Reginald Farrer)

3) Any botanical difference between it and the other gentians as in *acaulis* (without apparent stem), *glauca* (covered with a fine powder), and *punctata* (dotted)

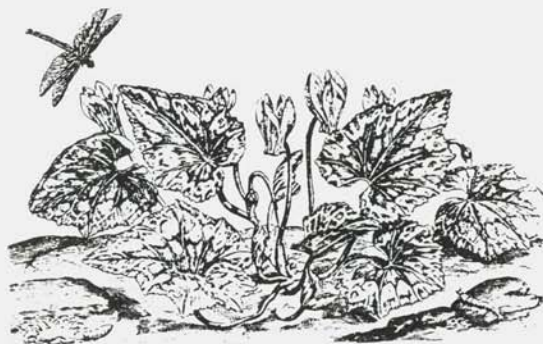
4) The color of the stem or flowers as in *purpurea* (purple)

5) Something else that struck the botanist as in *frigide* (cold places), *thermalis* (warm), *propinqua* (near), and *verna* (spring)

6) And, there are degrees of a characteristic: *flava* (yellow), *flavescens* (yellowish), *flavissima* (very yellow).

It would be wrong of you to say to your inert, do-nothing teenager, "Move your *rubricaulis*," for that only means red stem. Spend your time consulting the dictionaries on the meaning of Latin binomials. It's fun and some of the meanings will stick with you. And, remember, always use my pronunciation — eager, arbitrary, and plagiarized from everyone I've ever heard talk.

*Kathie Lippitt, Scotia, NY is a frequent contributor to the Bulletin.*



*Cyclamen*





*Phlox bryoides*



*Phlox hoodii*





*Phlox missouliensis*



*Phlox 'Betty Blake'*

# The New Jersey Pine Barrens

Rick Darke

Few sensible people come to the northeast in search of wilderness. In particular, New Jersey's reputation for crowded conditions and an abundance of asphalt would seem to make it an unlikely place to plan a botanical outing. If, like many people, your experience with New Jersey consists of traveling on the New Jersey Turnpike, you're probably unaware that to the east lies a near-wilderness area the size of Grand Canyon National Park. The New Jersey pine barrens occupy over one million acres in this four-million-acre state. The area is truly a national treasure, and if you have only one chance to see it, mid-June should be the time.

New Jersey's natural landscape is diverse. The northwestern corner is made up of mountains belonging to the Appalachian chain. A line drawn from New York City to Philadelphia divides the state just above the middle, forming the boundary between piedmont and coastal plain. The coastal plain forms a low dome with a belt of hills separating the inner and outer sections. The pine barrens occupy an area that corresponds roughly with the outer coastal plain.

The use of the word "barrens" to describe this area dates to mid-seventeenth century European settlers whose viewpoint was decidedly agricultural. The coarse sandy soils are largely infertile, and eking out a living from them proved nearly impossible.

In the heart of the barrens, the outlook from a spot such as the Apple Pie Hill fire tower reveals an apparently endless expanse of pines. Radiating from the base of the tower are a few sand roads, part of a confusing network of local trails, stagecoach roads, and fire roads that crisscross the barrens. From the tower's height they appear as gleaming white ribbons cutting clean paths through the pines. Back on the ground, however, they are maddeningly alike, and can pose formidable navigation problems for the uninitiated.

There is undoubtedly a monotony to this landscape. Seldom exceeding thirty feet, scrubby and irregularly branched, the pitch pine *Pinus rigida* is the characteristic forest tree. This three-needled pine ranges from New Brunswick, Canada to Georgia, but nowhere except in the pine barrens of New



Jersey does this species dominate such extensive acreage. To travelers bound for the Jersey beaches from Philadelphia, the miles of pinelined roads that must be traversed are perhaps no more than a boring enigma, but for the connoisseur of unusual landscapes the pitch pine lends a stark beauty to the barrens. On a moonlit night, light shines through the open canopy of the pines to brighten the sand beneath your feet, and you can walk these woods without the aid of a lantern. But there is much more to the pine barrens than the pines.

The region is famous among members of the botanical community for its many rare and unusual species. Fourteen northern plants reach the southern limit of their coastal plain distribution in the pine barrens. In this group is the tiny curly grass fern *Schizaea pusilla*, whose common name derives from the grasslike appearance of its narrow fronds. *Schizaea* can be frequently found growing on raised "hummocks" in boggy areas in the pine barrens, but has not been found further south. Its northern distribution is disjunct, possibly due to past glaciation and our sinking eastern coastline. After a limited occurrence on Long Island, it is not seen until Nova Scotia and Newfoundland. Over one hundred southern species reach

their northern-most limit in the pine barrens, including turkeybeard, *Xeriphyllum asphodeloides*. Closely related to our western bear-grass, *X. tenax*, turkeybeard flowers in late May or early June from a basal tuft of grasslike leaves.

There are surprisingly few true endemics. Pine barrens sand myrtle, *Leiophyllum buxifolium* var. *buxifolium* and pickerel morning glory *Breweria pickeringii* var. *caesariensis* are not known to occur outside the New Jersey pine barrens. However, the exciting nature of the barrens' flora has less to do with exclusivity and more to do with unique combinations and local abundance of otherwise rare species.

The existence of the pine barrens and the origins of its unusual floral composition pose many questions still unanswered. Fossil records show that many modern-day genera, including the pines and oaks, grew in the area as long as seventy million years ago. Yet it is almost certain that their occurrence has not been continuous, in view of dramatic changes in geology and climate since that time. Although during the last major glaciation, southern movement of the ice sheet stopped thirty miles short of the edge of what is now considered the pine barrens, the close proximity of the glacier



probably created near-arctic conditions on the coastal plain. Many of the temperate species that make up the present barrens' flora probably moved in after the glacier subsided about ten thousand years ago.

One factor certain to have had a major influence on the nature of the vegetation is the long term high incidence of fire. The coastal plain is made up largely of unconsolidated coarse sands and gravels deposited by ancient seas. The droughty soils, high winds and abundant fuel supply contribute to naturally occurring and human-related fires that tend to be both frequent and wide-ranging. It is likely that not a single acre of the barrens has escaped burning during the last century alone. The pine barrens forests as we know them represent a "fire climax", and if fires were artificially prevented for a long enough period, the species composition would be dramatically altered.

Most species that successfully inhabit the region today are highly flammable yet highly resistant to fatal damage by fire. For example, among pines, the pitch pine has the unusual ability to sprout from dormant buds both basally and along trunk and branches. This sprouting in response to fire injury contributes to the pine's irregular form. Many other pine barrens trees, shrubs and herbs are ca-

pable of being repeatedly burned back to the ground, only to resprout from underground rootstocks. Nowhere is this more apparent than in the approximately twelve thousand acres that are referred to as the "plains" or "pygmy forest." In these areas the pitch pines rarely top nine feet, and there seems to have been selective pressure here toward a serotinous race whose cone scales only open after firing. The pines are accompanied by similarly dwarfed oaks and various ericaceous shrubs, and the plains forest is almost impenetrable on foot. The origin of the plains is still open to conjecture, however fire frequency in the area has historically been twice that of the surrounding barrens, and appears to have had a major influence.

Curiously in light of this, water is considered to be the region's most abundant and valuable natural resource. The ultimate source of all water in the pine barrens is the forty-five inches of rain that falls each year. Most of this filters rapidly through the porous soils, filling an immense reservoir, the Cohansey aquifer, that under-lies the barrens. This aquifer is estimated to contain more than 17 trillion gallons of water on average.

All the streams and rivers that flow in the pine barrens

originate there. The surface water is usually tea-colored. The color is not due to pollution, but to the harmless leaching of organic materials. Especially by modern standards, the water is exceptionally pure. Captains of sailing ships once filled their barrels with "cedar-water" from the barrens, valuing its ability to remain potable much longer than ordinary river water.

The high acidity of the pine barrens environment has been a strong selective agent in regard to both plants and animals. The soil, ingeneral ranges from pH 3.5 to 5.0. The waters are equally acidic. Although there are certain notables among the animal population, such as the endangered pine barrens tree frog, there is not the diversity of species found among the plants because the young of many animal species cannot tolerate the high acidity. Not surprisingly, most pine barrens plants are acid tolerant, and the Heath family, *Ericaceae* is particularly well represented.

Although the pine barrens is comprised of many different plant communities, perhaps the most easily observable single factor influencing species distribution within the barrens is the availability of moisture. The surface soils hold little rainfall, and in upland areas growing conditions are quite droughty. The whole of the barrens is at or

below two-hundred feet above sea level, however, and the difference between upland and lowland often seems a matter of a few yards. The aquifer is seldom more than twenty feet down, and in lowlands the water table is frequently at or near the surface creating numerous lakes, swamps and bogs.

The drier upland areas are characterized by pitch pine forests. *Pinus rigida* is the dominant tree accompanied by various oaks, including blackjack oak, *Quercus marilandica*, post oak, *Q. stellata*, chestnut oak, *Q. prinus*, and black oak, *Q. velutina*. The evergreen inkberry holly, *Ilex glabra*, is common in the shrub layer, as are huckleberries including *Gaylussacia baccata*, and blueberries including *Vaccinium vacillans* and *Vaccinium corymbosum*. Mountain-laurel, *Kalmia latifolia*, puts on a spectacular show in sunny openings in early June. Forms with pink flowers and deep red buds can be found. Herbaceous species in the drier woods are relatively few, but include the ubiquitous bracken fern, *Pteridium aquilinum* and cow-wheat, *Melampyrum lineare*, whose small yellow snap-dragon-like flowers last from early summer until fall.

There is a wealth of color and interest to be found in dry, sunny sites. Occurring in small patches or occasional huge drifts, golden-

heather, *Hudsonia ericoides* covers itself with bright yellow flowers in late May. *Hudsonia* is not a true heather but rather a member of the rock-rose family, *Cistaceae*. *Leiophyllum*, another May bloomer, often creates dramatic sweeps of white. It is frequent in the plains areas, which also have a greater occurrence of some of the unusual pine barrens species such as pyxie-moss, *Pyxidantha barbulata*, and broom crowberry, *Corema conradii*. The banks of roads leading through the plains shimmer with sunlight reflected off the glossy leaves of bearberry, *Arctostaphylos uva-ursi*. In addition to turkeybeard, sun-loving perennials in dry areas include June-blooming pine barrens sandwort, *Arenaria caroliniana*, goat's-rue, *Tephrosia virginiana*, and the fall-blooming *Liatris graminifolia* and *Aster linariifolius*.

Due to past logging, there are no longer any vast stands of white cedar, *Chamaecyparis thyoides*, remaining. However this stately evergreen is still invariably found along streams, rivers, swamps and bogs throughout the barrens. It is in these wetland habitats that the vegetation exhibits its greatest color and diversity. Trees growing in association with the cedars include trident red maple, *Acer rubrum* var. *trilobum*, black gum, *Nyssa sylvatica*, and

sweetbay, *Magnolia virginiana*. Ericaceous shrubs include swamp azalea, *Rhododendron viscosum*, fetterbush, *Leucothoe racemosa*, leatherleaf, *Chamaedaphne calyculata*, staggerbush, *Lyonia mariana*, and sheep-laurel, *Kalmia angustifolia*, which is equally at home in dry conditions. Sphagnum mosses blanket the bases of trees in the cedar swamps, and much of the surface in between. The *Sphagnum* species vary in color from bright greens to wine red, creating a colorful mosaic.

The herbaceous members of the bog flora begin a glorious display of color in late April with the flowering of golden club, *Orontium aquaticum*. Bright yellow spikes of this aroid rise above blue-green foliage like jacks without pulpits. May brings thousands of pitcher plants, *Sarracenia purpurea* into bloom, and before the month is over *Arethusa bulbosa*, one of the rarest of the pink pine barrens orchids, will be flowering on the hummocks. Two more pink orchids, the rose pogonia, *Pogonia ophioglossoides*, and the grass-pink, *Calopogon tuberosus*, open in June, along with various bladderworts, *Utricularia* spp. both yellow and purple. Three sundews, *Drosera rotundifolia*, *D. intermedia* and *D. filigormis* are common among the sphagnum carpet. The rare bog-asphodel, *Narthecium americanum*



, adds its yellow spikes and by late June the surface of the bog has become a golden haze dotted with pink. Pink-flowered milkworts, *Polygala cruciata*, *P. brevifolia* and orange-flowered *P. lutea* begin in June and are frequently accompanied by white-fringed orchis *Platanthera blephariglottis* in August. In damp soil, the exquisitely blue *Gentiana autumnalis* is at its spectacular peak in late September.

Three hundred years ago the pine barrens could be dismissed by settlers as worthless and ignored in favor of more productive land, but today population pressures and dwindling resources elsewhere are having their impact. The region has not been undisturbed in the past. An iron industry that once flourished was responsible for the lumbering of huge tracts. In the nineteenth century Joseph Wharton, a Philadelphia entrepreneur, amassed large holdings in the barrens with the intent of exporting water to the City of Philadelphia. The New Jersey legislature passed laws forbidding such export, and the state later purchased Wharton's holdings to create the Wharton State Forest.

Protection of this unique natural area solely through land acquisition is impractical, however. The area is simply too vast. In 1978, recognizing the

national significance of the pine barrens, Congress established the Pinelands National Reserve, offering increased federal environmental protection to the area. New Jersey followed with the Pinelands Protection Act in 1979, which includes some of the strongest land use legislation in the country. The Pinelands Commission oversees implementation of a comprehensive management plan designed to preserve and protect the area's natural resources. The future of the pine barrens looks bright.

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*Rick Darke is Curator of Plants, Longwood Garden; Kennett Square, PA. Portions of this article first appeared in the American Association of Arboreta and Botanic Gardens publication.*

# What You Will See

Tam Hartell

Mid-June in the New Jersey pine barrens finds a gentle display of plants that will appeal to rock gardeners. This unique habitat hasn't the drama of the mountainous landscapes of western North America. Its appeal lies instead in a subtler display. The landscape here is rooted in sand, sometimes moist, but more often dry, even in the woodland areas. Sphagnum bogs and white cedar (*Chamaecyparis thyoides*) swamps, frequently encountered in woods or open fields, provide a counterpoint to the large sandy tracts.

At this time of year most *Eriaceae*, frequently encountered here, are past their flowering. *Chamaedaphne calyculata*, as well as their blooming season, leaving *Rhododendron viscosum*, the swamp azalea, the only member of the family still in flower. The display of the pine barrens gentian, *Gentiana autumnalis*, has yet to come. Never fear, what he does see in June will gladden the heart of any rock gardener. This is the best time of year to see the pine barrens orchids, and there will be other interesting species as well.

Here in the pine barrens we find northern species at their

southernmost limit, as well as southern species that go no further north. At the edges of cedar bogs one may encounter the little Curly-grass fern, *Schizaea pusilla*, which is found outside the pine barrens only in a few locations to the north. One has to look carefully at the *Schizaea* to realize that it is a fern. Its sterile fronds look like curled blades of grass and the fertile fronds, no more than six inches tall, have only a short row of folded pinnae at their tips. I have never seen this charming curiosity in cultivation, but perhaps in the future some clever gardener will learn the secret, if there is such, of growing it.

Only yards away from the boggy site where the *Schizaea pusilla* grows, in a wooded sandy tract, there are specimens of *Leiophyllum buxifolium* that are as much as three feet across. These shrubs are more impressive than those usually seen in gardens, and certainly appear to be of considerable age. The smooth pediceled form of this shrub occurs only in the pine barrens, but *Leiophyllum buxifolium hugerie*, with gland-tipped hairs on its pedicels, occurs here and in the southern mountains as well.

In some field in which a few larger ericaceous shrubs (*Rhododendron viscosum*, *Vaccinium corymbosum*, *Kalmia angustifolia* and *Lyonia mariana*) occur at random among the tall grasses, there may be a surprise or two for the diligent searcher. At first glance the only flowers seem to be those of *Melampyrum lineare*, whose yellow and purple-brown flowers bloom all summer in dry areas of the pine barrens, and the dwarf dandelion, *Krigia virginica*. A closer look reveals the orange drumstick blooms of *Polygala lutea* contrasted with the charming, if modest, pink or magenta blooms of *Calopogon tuberosus* (*C. pulchellus*), one of the many orchids to be found in the region. An even closer look at the ground may reveal a carpet of *Pyxidantha barbulata* covering so much of the ground that one hesitates to take a step. Perhaps, too, the visitor will find the eastern prickly-pear, *Opuntia humifusa*, somewhere nearby.

From open field one wanders into one of the numerous cedar bogs of the pine barrens to encounter the sundews, *Drosera filiformis*, *D. rotundifolia* and *D. intermedia*. The swamps and bogs are also home to pitcher plants, and to the only pink flowered St. John's-wort, *Triadenum virginicum* (*Hypericum virginicum*), as well as numerous examples of the curious *Utricu-*

*laria* spp. In mid-June *Pogonia ophioglossoides* will be in bloom, contributing its own charm to the scene.

In the large sand tracts of the pine barrens we find the broad, tight mats of *Minuartia carolinia* (*Arenaria caroliniana*), the roots of which may go down as much as five feet in search of water. These plants, their major period of flowering now past, will continue to produce sporadic bloom throughout much of the summer.

These large sand tracts are also the home of one of the more appealing sights of the barrens — the Pygmy Plains. Here *Pinus rigida* and *Quercus marylandica*, burned over by repeated fires, form "forests" little taller than a man, and among the little trees the growth consists of bearberry, sweet fern (*Comptonia heterophylla*, once *C. peregrina*), *Hudsonia ericoides* and the broom crowberry, *Corema conradii*.

As we travel the network of roads that cross the barrens we occasionally see commercial cranberry bogs, evidence of an industry that has come back to life in recent years. *Rhododendron viscosum* will be flowering among the tangle of roadside growth, and in ponds near the road the white flowers of *Nymphaea odorata*, our native water lily, will be in evidence.

The visitor should be warned, however, that he will want to



come back for another visit. As beautiful as the spring flowers may be, and enchanting as we find the subtle display of summer, a return visit in October will truly bring its reward, for it is in the fall that *Gentiana autumnalis* (considered by many

to be **the** flower of the Pine Barrens) colors fields and roadsides with its intense blue.

*Tam Hartell, Philadelphia, PA, is active in the Delaware Chapter and former chair of the ARGS seed exchange.*

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## Book Review

### The Pine Barrens

By John McPhee

In the 1960s, *New Yorker* staff writer John McPhee first wrote about the unique area in New Jersey called the Pine Barrens. Although close to New York City, the New Jersey Turnpike and the congested areas of northern New Jersey, the 650,000 acres of the Pine Barrens were mostly wild, undeveloped and relatively uninhabited.

Civilization has encroached upon the Pine Barrens to a certain extent, as McPhee notes in his addendum to the 1981 edition of *The Pine Barrens*. A few towns have developed on the periphery, developers have attempted to develop, and state, local and federal governments have become involved in the future of the Pine Barrens.

Still, much of this huge area remains a wilderness, a habitat

for foxes, pheasants and quail, deer, raccoons and other animals that roam through the pine forest's understory of "huckleberries, sheep laurel, sweet fern, high-bush blueberry". Inhabitants still survive by guiding visitors on canoe trips through the woods, gathering sphagnum moss, woodcutting or working in the cranberry bogs and blueberry fields.

The inhabitants of these pine woods are called pineys. They are independent, idiosyncratic loners who have a passionate love for their wilderness region.

It is the plants that draw ARGS members to the Pine Barrens. These woods are an unusual habitat with a number of rare, odd and choice plants. We will go there in June to seek out and appreciate the droseras,

orchids and all the other interesting plants, but that appreciation will be heightened if we read or reread McPhee's book before we go.

He helps us to understand contemporary problems of water usage and the sensitivity of the choice Pine Barrens aquifer. McPhee also weaves the history of the place — the stories of tarred and feathered Tories hiding in the Pine Barrens, Hessian deserters seeking haven there during the Revolutionary War, and the first American Indian reservation — throughout the Fred Brown oral records.

Smugglers made good use of the coastal access and the many streams. "The Pine Barrens were a smuggler's El Dorado, for all that wilderness so close to New York and Philadelphia was extraordinary even two hundred years ago . . . One of the earliest of the merchant smugglers was John Mathis, whose contemporaries always called him Great John. His descendants are spread across the pine belt today. He sent lumber from the Pine Barrens to islands in the Caribbean, and when the ships came back he smuggled his fortune in rum."

McPhee tells of the years in the 1700s-1800s when the Pine Barrens produced much of the iron in this country. Traffic on the sand roads throughout the Pine Barrens was heavy in those

years. Jug taverns at important crossroads were the centers of community activity. The iron towns and all their commerce vanished in the last half of the 19th century, when Pennsylvania coal and iron began to dominate the market.

After the iron industry died, many people left the area. During the twentieth century, the Pine Barrens have returned to the wild, beautiful, relatively uninhabited area McPhee visited and wrote about.

It is easy to obtain a copy of his book, because fortunately *The Pine Barrens* is still in print. In fact, both the 1968 and the 1981 versions are available. If you are going to order a copy, make it the 1981 edition, because McPhee's writing is enhanced by the addition of a portfolio of black and white photographs by Bill Curtsinger, a National Geographic photographer.

Sandra Ladendorf

*The Pine Barrens* by John McPhee, Farrer, Straus & Giroux, \$5.95 paperback



# Mysteries and Mertensias

Ann Lovejoy

In a recent issue of the *Bulletin*, our editor asked us to think and write about those plants which had most recently captured our imagination or fancy. Having been heavily smitten for the past year, I wonder how many others are growing my latest delight, *Mertensia asiatica*? This is a littoral sprawler, born to grace the rocky beaches of Japan. I first saw it in the garden of a friend here on Bainbridge Island. We passed down the long border, admiring combinations and individuals in profusion. When we arrived at this mertensia, my host continued but I stopped dead in my tracks. There, sheltered beneath a silvery subshrub, a ruffled whorl of succulent stems suffused with soft tints of pink and plum made a mound perhaps 2 inches tall and a good foot across. Each stem was decked with rounded, spoon-shaped leaves of misty, glaucous blue, indeed, a cool, soft, supernal blue, and each was frosted with silvery bloom that made the whole plant shimmer. My host returned, diagnosed my condition and a deal was struck. The plant would be mine the following spring, when my friend would be leaving the island and breaking up the garden.

In early March, the mertensia was a modest swirl of silver blue shoots, most having numerous small white bumps at the base that looked as if they were longing to be roots. Before transplanting, we detached some of these shoots and potted them up. Nearly all of them struck, many blooming that first summer. These were snapped up at once by visitors taken with this mertensia's charms. The mother plant was set tenderly in a sunny bed of fast draining, fairly rich soil, to which it responded by flinging out dozens of elegant arms. In June, each arm ended in a cluster of slender bluebell buds exactly like those of its American cousin, and which opened in due course into minute bluebells.

By August, the dear girl was clearly flagging, setting quantities of seed (which will be sent to the seed exchange) and fading to a soft chamois-colored mess. Once the seed ripened, we cut all the flowered shoots back to the base. That left a paltry few stubby little central shoots, all looking a bit frail. A thin mulch of compost and well-rotted manure was rewarded with a new crop of healthier looking stems, and it is to be hoped that next



spring will find our wonderful mertensia ready to perform again. If not, well, there are still a few rooted cuttings about, and plenty of seed. I have no idea what its hardiness might be, and would love to hear from others growing this fetching plant, for I have found next to nothing about it in my usual reference books, and several people have questioned the nomenclature, though without being able to supply a better name, Any ideas?

Another enchanting mystery plant in my garden was sent by a friend in California as *Alchemilla ehlenbeckii*. This flat creeper has typical pleated alchemilla leaves, tiny fans smaller than my smallest fingernail, all equipped with the familial microscopic barbs to hold water droplets at their tips. The sturdy stemlets are rich, clear red, against which the deeply lobed and scalloped leaves show off

their whiskery, silvered edges handsomely. It runs about in a quiet way, making ruffled mats an inch or two high at most, and seldom, if ever, seems to flower, though I am told it does so, in the usual family way, lifting small sprays of greenish yellow stars on wiry little stems a few inches high. Not invasive and easily rooted out, it spreads happily in any soil, in sun or shade, though a big patch in full sun was burned to a crisp during our summer drought of 1987. I have since been offered several variations of this name, but again have not been able to verify any of them, and would welcome positive identification.

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*Hepatica triloba*

# Seed Germination

Klaus Jelitto

There are still a lot of mysteries concerning the germination of perennials. Not all species simply germinate within a few days or weeks. There are even some species — such as *Trillium* — that, in the wild, can lie in the soil for years without germinating. What kind of species are these, that aren't willing to germinate on cue after sowing, and what causes these seeds to behave in this manner? During the course of evolution plants have become adapted to their environment, morphologically as well as physiologically. This includes, of course, the germination behavior of their seeds.

— This germination behavior, which is aimed to guarantee the survival of the individual plant species in nature, often causes difficulties in cultivation, which are aggravated by man's impatience. And, of course, it is often the most beautiful flowering perennials that are the most problematic. They usually come from mountainous regions — like the Rocky Mountains, the Alps, or the Pyrenees. In these regions the generation cycle is short and flowering and subsequent fruit development are correspondingly rapid. The

flower buds for the next generation are usually already formed before the onset of winter, so that flowering can begin immediately after the snow melts the following spring.

The great majority of these plants are pollinated by insects, although a few are wind-pollinated. Due to the low temperatures, which often prevail in mountainous regions, insect flight is possible only during the sunny hours of just a few weeks of the year. In order to optimize this situation, alpine plants tend to be visually attractive, in order to facilitate the insects' orientation. They are often brilliantly colored and have a characteristic odor that acts as a lure. They reward the insects with sufficient solid and liquid nutrition and, in addition, often offer protection in the form of shelter and warmth. All of these features combine to make these flowers particularly attractive to our perception, our eyes, as well.

The short periods in which pollination is possible in mountainous regions can be further restricted by fog, storms or rain. Thus, in some regions, we find that seed development is often limited or may not occur at all — even after profuse

blooming. In the mountains it is common for seed development to be extremely variable at different altitudes. Whereas at 650 feet a particular species may show good seed development, at 3,200 feet the same species may fail to set seed altogether. Even when seed development is good quantitatively, seed *dispersal* may be restricted by other factors, such as seed-eating birds, insects, fungi or bacteria.

Seed maturation in mountainous regions (and here my knowledge comes only from Europe) ensues about July — only very seldom somewhat earlier — and lasts until about October or November. And then, for the late-ripening species, an early snowfall often presents an additional hindrance to seed development. The seeds of these alpine plants are, for the most part, dispersed by wind, and exhibit corresponding adaptations; for example: *Pulsatilla*, *Geum* or *Dryas*, etc. In cultivation these adaptations tend to be a nuisance to the gardener during sowing, so they are usually removed, giving what we call “pure” or “rubbed” seed.

In the case of seeds without a flight organ, wind dispersal often occurs in the following manner: the stem that bears the seed capsule becomes more firm with maturity but maintains elasticity, and as it sways in the wind, the seeds are catapulted

out of the opened capsule. In this case the seeds are only able to become established in the vicinity of the parent plant.

Further dispersal of seeds occurs by birds, insects and other animals. The seeds stick to the fur or feathers by means of tiny barbs or by slimy, glandular hairs. They are eventually scraped off somewhere or they are eaten and defecated at another site. Other sorts of seeds are equipped with an elaiosome: an oily outgrowth that is attractive to ants, which then carry off the seed. Some seeds are embedded in a fleshy fruit that is eaten by birds, which then regurgitate the stone (seed). Animals — such as squirrels — hoard certain kinds of seeds in caches, and often at least a part of these are forgotten and germinate.

Yet another dispersal mechanism is the catapulting of seeds from the bursting seed capsule and then being carried away by water (*Caltha*). There are plants, where the seeds are not released until the winter snowfall, and then are dispersed in spring with the melting snow.

All of these are examples of spatial distribution of the seeds. But besides this, there is also a distribution in time. The life span of the species and genera vary greatly and often play an important role. Viability is not only determined by genetic



factors. The environment also plays a part. Poor locality or poor nutrition means seeds with a shorter viability period and sometimes with reduced germinating power.

In general, the seeds of alpine plants remain viable far longer than we imagine. It is just that for us working in cultivation, the older the seeds are, the more difficult it is to induce germination. With this aspect we come to so-called dormancy, which could also be referred to as germination inhibition or germination retardation. These terms describe a mechanism that is indispensable for the survival of many plant species in their natural habitat, but which, over a long period of time, at least with cultivars, can be lost. Take, for example, *Leontopodium alpinum* (Edelweiss). In the wild it produces only seeds with a dormancy period, which can only be germinated when handled as "cold germinators." The Edelweiss that we have in cultivation, however, germinates without any hindrance at temperatures from 68-86 degrees Fahrenheit in about 3-10 days. We find the same thing with *Primula vulgaris*, *Primula elatior* and others. With *Pulsatilla vulgaris*, *Primula bullesiana* and other species we find an intermediate state. The absence of a germination inhibitor can be bred into the plant.

In the wild these precocious seeds don't contribute to reproduction, since the fragile seedlings are destroyed with the onslaught of winter. But in cultivation, we can maintain these plants, which, due to the lack of a germination inhibitor, germinate precociously. This deficiency in germination inhibition may be a hereditary gene defect, since it is maintained and passed on to the progeny. In the wild this doesn't happen because these seedlings always succumb early. The absence of a germination inhibitor can also be due to other factors. I'll come back to those later.

Dormancy is a state in which the seed doesn't germinate, despite optimal conditions of humidity, temperature, and oxygen. Dormancy is overcome as soon as certain conditions are available to the seed. The causes of dormancy are various:

- 1) The embryo may be unripe or physiologically inactive.
- 2) The seed coat may be mechanically difficult to penetrate, impermeable to water and gases.
- 3) Due to the presence of inhibitors (germination inhibiting substances, phytohormones).

These three types may occur alone or variously combined.

### **1. — Rudimentary or immature embryo:**

In some cases the embryo is composed of numerous meris-

tematic cells; the organs are not yet differentiated. Or — the embryo is differentiated, but is still surrounded by endosperm and, after inhibition, must grow for a while in the seed before it is viable.

### **A physiologically inactive embryo:**

is a fully differentiated embryo, in which the enzyme system is not yet active. These seeds often need a stratification period or an after-ripening period at low temperatures. This type often also has inhibitors in the embryo as well.

### **2 — Impermeability of the seed coat:**

Such an impermeable testa forms during seed development and is impermeable to water or gas, as the case may be. Typical for this type are numerous Leguminosae. These seeds have a hygroscopic valve — called the hilum — that opens when it is dry and closes again as soon as it is moist. Overcoming this hindrance leads to immediate germination. When the testa is impermeable to gas, anaerobic conditions prevail inside the seed (for example, in the seeds of *Xanthium pennsylvanicum*). If the testa is damaged or is removed, oxygen can enter the seed and germination can follow.

In many plants the embryo doesn't have enough strength to

break through the hard seed coat by itself — without outside help, the most time-consuming of these being weathering. But in this type it is supposed that inner inhibitors play a role as well, and by the time they are no longer active, outside factors have made the seed coat penetrable. The easiest way one can overcome the problem of a hard seed coat is by immersing the seed in concentrated sulfuric acid ( $H_2SO_4$ ) and then rinsing the seeds well afterwards.

But take care in handling sulfuric acid! It is extremely aggressive and immediately eats holes in fabrics, leather (and skin!). It is best to sink the seeds in a steel sieve into the acid. The sieve also allows the easiest rinsing of the seeds afterwards. **Never** immerse wet seeds! If water comes into contact with the acid, it may boil up and react violently, and could easily cause caustic burns. Immersion of dry seeds causes no obvious reaction with the acid.

### **3—Inhibitors:**

These are germination repressing substances, whose effect is either weaker (in glucoside-bound phenolic inhibitors) or stronger (as in the free form), depending on their chemical bonds. Inhibitors include, among other things: aldehydes, alkaloids, unsaturated lactones, ethylene, coumarin, abscissic

acid = Dormin, salicylic acid, scopoletine, juglone, lunularic acid, etc. At this point I would like to mention that inhibitors can very easily be added to seeds from the outside and usually penetrate from all parts through the pericarp, testa and endosperm right into the embryo. My own experiments have shown that, if for some reason an inhibitor lands in a fresh sowing, even quick germinators like *Aurinia* or *Arabis* can go into a completely dormant state. But the seeds of **different** plant species react differently to the **same** inhibitor. It would seem then that dormancy is often influenced simultaneously by several substances (phytohormones) and their concentrations. Also in the case of the so-called combined dormancy, the presence of one dormancy mechanism does not exclude that of another.

*Fraxinus excelsior* has (fide Villiers and Wareing, 1964) an embryo that is differentiated, but still very small at the time of separation from the mother plant. The growth of the embryo in the seed proceeds relatively quickly at the warmer temperatures, although it is hindered by a pericarp that restricts the oxygen supply. But also, when the embryo has enlarged, it still exhibits dormancy, and needs stratification before it is viable. In the example cited there is an

oxygen deficiency on the one hand, and an embryo that is at first unripe, then physiologically inactive on the other — thus, a combination of factors that prolong the effective dormancy.

The ecological significance of dormancy was defined by (R. D. Amen, 1966 and 1974) as follows: "as a living organism, the dormant seed preserves the survival and differentiation potential of the individual during a period of inopportune growth conditions, even when it appears to be dead (called the cryptobiotic phase)."

The goal of the various dormancy mechanisms is to restrict germination to periods when growth is opportune, insuring the survival of the greatest possible number of seedlings and, thereby, the survival of the species. Such seeds, which need a cold period or a stratification period possess a sort of control system that allows germination **only** in post-winter conditions, when the danger of freezing is reduced. This way the seedling has the best chance to grow into a strong young plant that will hopefully survive through the coming winter. Since one of the most common causes of dormancy is associated with the seed coat, simple scarification of the seed coat can often break or shorten the dormancy period, or at least increase the germination rate. Where such plant species



occur in the wild, the seeds are often rubbed by shifting sand particles during soil and ground movements, or by the wind. This represents a natural scarification process. Another natural scarification process occurs through the digestive effect of epiphytic fungi that become attached to the seed coat. Yet other seeds are eaten by animals and thus are subjected to the action of gastric acids, which corresponds to a chemical scarification.

In alpine regions germination normally doesn't begin until about one week after the snow melts. This may be correlated with the ground temperature, which, during the daytime, can reach 59 degrees Fahrenheit. But it can also be associated with light intensity. Consider that 1.9 inches of snow lets, at the most, 30% of the light through. But with 7.9 inches, light penetration is reduced to about 5%. Keep in mind that the ground beneath the snow in alpine regions is almost **never** frozen; the temperature is about 33.8 degrees F.

Some scientists believe — though it has not yet been proven — that under certain light conditions the usual effect of specific temperatures can be increased, decreased, cancelled, or in any event, qualitatively changed. There have been very few studies of the light sensitivity of the

seeds of alpine plants. In laboratory experiments carried out by Bliss (1958), Mooney and Billings (1961), Sayers and Ward (1966) and Fossati (in 1976), the majority of seeds germinated better in light. Light also seems to influence germination inhibition. Experiments by the Americans, Amen and Bonde, with seeds of *Carex ebenea* from the Colorado Front Range showed that these germinated best under fluorescent red light. The American scientists explain this as an ecological adaptation, since from summer to fall, the percentage of red to far-red light decreases. The seeds of *Carex ebenea* are not ripe until late summer or fall. However, in winter there is too little red light available, so that the seeds are not able to germinate until the following spring.

The temperature/light relationship, which I mentioned previously, probably also causes, among other things, a rise in the gibberellic acid level in the seeds. This phytohormone, which is responsible for cell elongation, directly activates the germination process. Bianco and Pellegrin in Paris in 1973 showed that — for example, *Loiseleuria procumbens* — cannot be brought to germination under far-red light. However, with the addition of a weak concentration of gibberelline, complete germination occurred very quickly —

even in the dark. Here I want to mention a special peculiarity that can be particularly unpleasant in professional cultivation. Sometimes — I don't know if it's due to the particular year or the particular locality — a single plant can produce seeds with different dormancy types. Even within one flower, seeds with different degrees of dormancy can be produced. One finds this frequently in the Asteraceae (previously called the Compositae).

For the germination of all kinds of seeds, including those without a dormant period, moisture is the primary, and temperature the secondary factor. At the time of dispersal, seeds normally contain little water, and are thus basically nonviable, since a great part of the life-maintaining biochemical processes are carried out in a watery milieu. The seeds must first imbibe water — in a greater or lesser amount — depending on the species. For germination, water is indispensable.

With some species occurring in the wild, water-soluble germination inhibitors are gradually washed away by the rain. When the seed is swollen from water imbibition, various temperatures cause biochemical and biophysical changes in the embryo. As is to be expected, different species have different temperature optima. In our germination

laboratory we use 86 degrees Fahrenheit by day and 68 degrees F by night as the optimal temperature for normal germinators. But for the seeds with germination inhibitors we use completely different, quite variable temperatures. In all cases, however, these seeds are first subjected to the warm temperatures as for the normal germinators for a period of 4 (or in some cases 6) weeks. In this way we notice when the inhibitors are partly or totally absent in a species that normally has them. It should be pointed out, when working with perennials, the grower must take out these precocious seedlings that appear before the seed has been chilled, so that they don't die during the chilling treatment.

We use a germination cabinet built after the Jacobsen System, with a refrigeration unit and cool water tank, with the water inside cooled down to 28.4 degrees F. A stirrer keeps the water in constant motion, so that it doesn't freeze. Using this cooled water we can regulate the temperature in the individual levels up to 35.6 degrees F. This is sufficient for the so-called cold germinators (seeds with inhibitors, which I introduced under "number three" previously), with the exception of the Ranunculaceae.

We can control each level of the germination cabinet inde-

pendently with timers, thermostats and magnetic valves. Temperature sensors are built into the bottom of the basins on each level. Each basin has two temperature sensors — one for cooling and one for heating. During cooling the cold water flows into the lower-most group of basins, and the warm water flows off through an overflow drain. There are always some seed populations in which only a certain percent of the seeds are adapted to germination at or after low temperatures. The rest germinate at considerably higher temperatures and often very rapidly (as I mentioned before in connection with our germination laboratory). Thus equipped from nature, such a population is guaranteed to have at least some survivors under any number of climatic or temperature conditions. But in cultivation these populations cause unbelievable difficulties.

After the seed with inhibitors has undergone the first phase — about 4 weeks at a warm temperature from 68 to 77 degrees F. and the seedlings appear, these must be removed before the seed is chilled for 4 to 6 weeks at about 32 degrees F. It is also important that the seed be kept moist at these low temperatures, which should not be above 39.2 degrees F. and below 24.8 degrees F. During the chilling period, if fluctuations occur that

are above or below this range, then the chilling period must be extended to compensate for this deficiency, if a good germination percentage is to be achieved. After the chilling treatment, the temperature should be raised gradually. For example, during the first 2-3 weeks, 50 degrees F. by day and 41 degrees to 42.8 degrees F. at night. For many alpine species this is an ideal germination temperature. For Ranunculaceae, however, the temperature during chilling should be between 32 degrees and 23 degrees F. With some alpine seeds, the chilling period may be shortened or left out altogether, by the addition of very small amounts of gibberelline (GA3). A concentration of 50 or 100 ppm is sufficient. In some cases even weaker solutions suffice.

But in nature the most critical period in the life of a plant doesn't begin until after germination. The survival rate of seedlings in the wild is extremely low. In particular habitats, certain species are completely absent. Thus, in an alpine meadow with the white *Pulsatilla alpina*, not a single plant of the yellow *Pulsatilla alpina* var. *apiifolia* (previously called *Pulsatilla alpina* var. *sulphurea*) is to be found. Bordering this meadow there may be another meadow in which only *Pulsatilla alpina* var.



*apiifolia* is blooming. Without question, the seeds of the two species — or subspecies — respectively, are carried back and forth by the wind. But after germinating they have no chance of survival in the “foreign” meadow because the conditions aren’t right. The yellow *Pulsatilla* only grows on acid soil (pH of about 5), while the white one prefers alkaline soils.

Before, I mentioned that there are other factors that can be responsible for the absence of inhibitors, and that I would come back to that later. I’d like to do that now. Some of the germination inhibitors are the same phytohormones that are responsible for abscission: the shedding of leaves or fruits. These hormones are not supplied to the seeds until the final stages of the ripening process. But sometimes certain events occur that require either an early harvesting or the shedding of seeds. Maybe this occurs just at

the time when the seeds didn’t receive enough of these growth regulators, but all other aspects of the ripening process were completed. Another possibility — out of several — is that, after ripening, the inhibitors are washed out of the seeds into the open seed capsule, either through frequent rains, or — possibly — by cooling weather conditions. This seems particularly likely for the Asteraceae. We had ample opportunity to study this phenomenon with our seeds harvested in 1984, when north and central Europe experienced an unusually rainy and cool summer and fall.

*Klaus Jelitto is proprietor of a perennial-alpine seed company in Hamburg, Germany, whose catalog has specific germinating tips for each variety. This article is adapted from a lecture to The Perennial Plant Association.*



*Fritillaria meleagris*

# Hybrid *Lewisias*

Roy Davidson

More than a score of years have slipped by since the appearance of the Alpine Garden Society monograph under the able editorship of Roy C. Elliott, and it remains a valuable reference to the genus *Lewisia*. No other book on this genus has appeared, but in the ensuing interval there have been a great many *Lewisia* happenings: new species found and described, new phases or forms of others; and new explorations extending known ranges of some once thought rare and endangered. In the garden new seed strains have developed, new selections and new hybrid strains introduced; new techniques portend the success of the most reticent of these in cultivation.

It is highly likely that some gardeners will look askance at the idea of hybrid *Lewisias* when there is such an abundance of beauty in Nature's species, yet they are with us in ever-growing numbers (even discounting those that stem solely from the various sorts of *L. cotyledon*.) The true hybrids are only small of stature and appropriately daintier, mostly evergreen and mostly sterile as befits the true hybrid,

and they compensate for their non-seeding condition by flowering heavily in successive waves of color or even in a continuous display all through summer, and yes, most are easily kept in the garden. Mr. Elliott did not dwell on the true hybrids in his treatment although he did treat some of them.

Why indeed, we might ask, this fascination with induced hybridity? Well, in the first place it has become a part of standard taxonomic studies as a test of probable genetic affinity, and then besides, the plantsman enjoys the challenge. Some of the clones that have been with us fifty years or more speak for themselves; why indeed! Such tenaciousness in a genus not strong in this heroic quality is not to be put down frivolously. There are about twenty groups of these hybrids at present, the number based on the species combinations, and to the present there has been no overall consolidation of all the literature on the subject, most of it scattered in show reports and garden journals, to which is here added information from correspondents as well as

unpublished theses and other papers. A number of these cultivars have been grown from vegetative propagations in sufficient numbers to have become readily available to discerning gardeners who yearn for *Lewisias* with the hassle of providing special conditions for them.

(One of these twenty groups is here described from the author's forthcoming *Little Book of Lewisias*).

COTYLANA (*L. cotyledon* - *L. leana*) is a combination that is to be found in Siskiyou wild populations, the only substantiated hybrid of the genus found growing naturally, though certain few others have been suspect. The hybrid is sporadic rather than occurring in populations, and is frequently taken for *L. columbiana* (1) and only recognized (2) as being of hybrid origin. Purdy had published *L. whiteae* (3) from plants taken in the Illinois basin of the Rogue drainage. (4). This widely grown cultivar should now be properly known as *Lewisia* x 'Mary White' for the lady who found it; George Schenck said it to be "the most valuable as proved over a decade in my garden". (Seattle).

Other representatives of this hybrid taken from the wild are grown in private and public collections (5) Goforth found it colored from white through a rich carmine at Caribou Lakes, a

basin in the Trinity Alps that is the source of some of the major drainages in the region. (6). Also known in pastel lavender and tints of yellow, peach and apricot. (7) Kruckeberg likes to point this out as the "quintessential hybrid" among wildflowers, so perfectly intermediate in every way, and suggests that it may be able to persist due to freedom from competition in such open stoney mountain heights. (8) Raiche observed that wherever he had found these they looked to be very much the same, other than in color, suggesting that only F1 individuals were present, without trace of anything that could be thought of as a back-cross. "If such do occur (he muses) they are cryptic in appearance and even rarer than the F1." (9).

Of course the enthusiast can grow his own without the strenuous climb to the Klamath aeries of this hybrid. Dr. Hohn had explored the possibilities and was growing eight such raised from nineteen seed out of seventy-eight hand pollinations between *L. cotyledon* and *L. leana* in controlled conditions under glass. However from pollens gathered in the wild she was not able to establish an F<sub>2</sub> generation although she did obtain a few seeds which might have germinated under optimum conditions with frost, so that a fertile seed strain of small scale



hybrid *Lewisia* is not an entirely unlikely phenomenon.

1. Ferlatte, 1974
2. Tucker, et al, 1964
3. Leaflets of Western Botany, Sept. 1932
4. Type; Calif. Acad. Sci. herbarium #1931196
5. UC#82; 1336, Berkeley, col. Raiche, Siskiyou Mountains
6. "Genus *Lewisia* in NW

Calif." Unpublished Thesis, Humboldt State U. herbarium, 1977

7. J.T. Howell Cal. Acad. #596842, Caribou Basin, 1937
8. "Alpines of the Americas", p. 176
9. Letter, July 1987

*Roy Davidson, Bellevue, WA, is writing a book on Lewisias.*

## To The Mountain

### J. L. Faust

This year's annual meeting in Oregon's Cascades (July 29-31) was a "can you top this" event. Each day proved to be better than the one before.

First, the setting. Host chapter, Columbia - Willamette, selected a prize location. They nestled us at Rippling River Resort (post office, Welches) located in the sheltering forests of Mount Hood. The mountain, also known by its ancient Indian name, Wy'east, bolts skyward to 11,235 feet and was the focus of the gathering.

Nearly 300 rock gardeners fitted comfortably into the resort's 300-acre compound with separate two-story wooden buildings.

Second: the first evening. Reuben Hatch and Ken Love

showed slides of Mount Hood's flora and scenery to get everyone ready for the outings to the mountain. Slides only hinted of the plants and scenery that would be seen during the next few days. This was a mountain dominated by Douglas firs and western hemlocks.

The weather was most appealing. Bright blue skies and enough sun to keep things warm, but not sweltering; mornings were mountain typical — foggy and cool.

Buses loaded early each morning for ventures to the mountain. One hike to Mount Hood meadows was a walk through wonderland. If not the scenery — looking off southward toward snow-capped Mt. Jefferson — it was the plants.

Highlights included a seep where thousands of dodecatheon grew. Although most of it was in seed, a few blossoms were enough to start a debate if this one was the local species, *Dodecatheon jeffreyi* or another. The seep also had scores of *Tofieldia glutinosa*. There was the ever-present and dramatic beargrass (*Xerophyllum tenax*), which belies its place in the Lily Family. And nature's own garden: a splendid gathering of mountain heather (*Phyllodoce*) and Indian paintbrush (*Castilleja*) spiced with bright blues of the elegant lupine (*Lupinus lepidus*).

There was more! The trip to Timberline Lodge and Umbrella Falls. The lodge is a rambling building that hugs the south slope of Mount Hood. It was a work project for the WPA and celebrated its 50th anniversary last year. A 20-minute chair lift ride, which began at the lodge, took would-be hikers up about a mile to the top. With just a metal bar to hang on to, the chairs lift proved to be an adventure, but it was the only way to go. In no time everyone was up top and then came the adventurous walk down where plants could be seen eking out their existence in the thick pumice soil.

By this time plants were being seen again to reinforce new species that had been learned the day before. There was the cunning western pussy toes

(*Spraguea* or *Calyptridium umbellatum*), rather dramatic spreads of *Luetkea pectinata* and the old-familiar penstemons, especially *P. rupicola* and *P. fruticosus*.

At Umbrella Falls, the stream side provided perfect habitat for glorious *Mimulus guttatus* with its large yellow blossoms and maybe the pink one, *M. lewisii*, but too far to get close to. There was more *Castilleja* and assorted *Pedicularis*. Easterners were glad to see an old friend, *Mertensia paniculata*. There were scores of *Erigerons* and *Eriophyllum*, which one of the guides said was called Oregon Sunshine. It did glow.

Awards night gave splendid recognition to those who deserved it. The host chapter chairman gave high credit to his fellow members who worked hard to make the meeting run so smoothly. And who can forget Lois Kemp's beautiful slides and talk on "The Wonders of the Columbia Gorge."

Mrs. Catherine Hull, chairman of the ARGS awards committee, announced honors for the year. (These were covered in the Fall, 1988 Bulletin) Those from the East must have burst a few buttons for all four people named were East Coasters and three of them were from the Connecticut Chapter.

The best day was saved for last. Reuben Hatch led an en-

thusiastic group up the north-west side of Mount Hood along trails and through forests toward Cairn Basin. Though the trails were steep — 90 degrees in places, it seemed — plus snow fields to slip and slide across, the hike was well worth every step of the way. The leader kept us all at a racing pace. But there was an eagerness to follow to see what was ahead.

Transition zones were apparent as the vegetation changed. In the lower humid zone, there were wide spreads of the magnificent deer fern (*Blechnum spicant*) along the trail and a few blooms of *Anemone occidentalis* and *Mitella*, which gave way to the showy avalanche lily (*Erythronium montanum*) and assorted berries with their Rose

Family flowers. It was good to see fireweed (*Epilobium*) here and there. When the trail broke through the forests into the alpine zone, it led across snow fields where plants hugged the ground and kept to diminutive size.

Everyone had a secret to find and it turned out many were looking for the same plant: Mt. Hood lily (*Lilium washingtonianum*). It was there. Some lilies grew along the trail, thank you, but a few were out some distance and defied anyone to get closer.

We learned at the end of it all that we had started at about 4,000 feet and went up nearly 2,000 more. A day to remember.

*J. L. Faust is co-chair of the Connecticut Chapter.*



# Irises with Alpines in the Rock Garden

Leo Blanchette

Low growing bearded irises are outstanding accent companion plants for a scree rock garden. Their green blade-like leaves provide a striking contrast to dainty alpines. The bearded blossoms provide an added bonus with their warm welcome to spring.

Scree conditions are very different to those found in the usual perennial border. Scree, by nature, is an area at the base of a mountain cliff. Erosion wears away bits and pieces of the cliff creating a soil that is made up of stone dust, chips and chunks. Plant material that once grew here along with vegetation that was blown to this area by the winds provides organic matter for the soil.

I have tried to duplicate these conditions in my rock gardens by creating a soil that is extremely well drained, yet rich enough to retain some moisture. The original soil was removed to a depth of 24 inches where I hit a layer of sand. It is very important to remove any loam that may exist at the surface. (A major problem often arises after a few years if you don't. Earthworms present in the soil gradually raise the loam up into the scree. As they burrow through the ground ingesting soil

and organic matter, they excrete castings that are very high in nitrogen. The scree becomes too rich and it no longer has exceptional drainage.) The area was then backfilled with a soil combination of 10% leaf mold, 10% peat moss, 50% very sandy loam, 25% stone chips and 5% pea stone (1/4 to 1/2 inch stone.) To this, eight pounds of superphosphate (0-20-0) was added to the soil for every 100 square feet. Lime was also added to large areas to provide a high pH for plants that need a calciferous soil.

Any water that remains around the crowns of alpines often causes rot, so to further reduce any surface moisture, a two inch layer of pea stone was added as mulch. This also cuts down on weeding, lessens winter heaving and provides a grey background which is a wonderful contrast to green foliage.

Initially my want list contained a large number of plants that formed low, dense mats or tight little buns blooming mostly in June and July. I soon realized that a vertical foliage accent was needed. I like to see a lot of color during the growing season. When a plant is not in flower, the foliage should add to the overall effect of the garden. I began

looking for plants with long, broad pointed leaves that would enjoy an alkaline soil. I wanted the leaves first — foliage is often more important to me than flowers. If the plant bloomed in April or May that would be a bonus. I decided to try the lower irises. They have been one of my most pleasant gardening surprises.

Not only do they look good in the scree, they seem to flourish. Having planted some varieties in both perennial borders and the rock garden, I found those in the rock garden to be far more floriferous and to multiply two to three times faster. The leaves have remained in excellent condition far into the growing season, with little if any problems from disease.

I don't care for plants with huge flowers. I favor plants with delicate, well-proportioned bloom. The miniature dwarf bearded iris, standard dwarf bearded iris and intermediate iris have been an excellent pick for this. With their smaller blossoms they do not yell out, "Hey, look at me!", but rather provide an excellent combination with the early blooming alpiners.

It would be far too lengthy to list all the plants grown in my rock garden, but I can briefly comment on a few of my favorites.

The first plant to bloom anywhere in my garden is *Draba*

*aizoides*. Only a few inches tall, it blooms in early March. The yellow blossoms are a welcome sight so early in the spring.

The next major bloom comes from the Miniature Dwarf Bearded Irises. 'Tick Tac' is a little charmer. Blooming in early April its light blue flowers are a bright spot in the garden. This is also my fastest increaser. I started with a single fan in 1983 and I counted over 100 in the fall of 1985. MDB 'Commencement' is also a very early bloomer with its yellow flowers. MDB 'Scribe' seems to be on everyone's favorite list. Blooming in early May, the flowers are white with blue plicata markings.

When most of the MDBs are in bloom there is also a burst of color from a number of different plants. *Alyssum montanum* and *Alyssum scardicum* both grow to about eight inches and are covered with yellow flowers. *Draba siberica*, a dense plant with four inch flower stalks, is usually so heavy with bloom that its green leaves can hardly be seen.

An overlap of bloom occurs when the Standard Dwarf Bearded Irises begin to bloom. SDB 'Black Veil' and 'Michael Paul' are outstanding contrast plants to the masses of yellow, as they provide an almost black color to the garden. Two yellow SDBs that I have become very fond of are 'Sunbrella' and

'Dashaway'. These blend nicely with the other shades of yellow. 'Grapesicle' is my best grower. It multiplies very fast. The flowers are a light violet that perfume the air (excellent when planted near the darker SDBs).

As the SDBs start to pass, *Lewisia cotyledon* begins to bloom with outstanding waxy pink blossoms. The flowers are delicate and blend well with other plants, but once seen they are not soon forgotten. The leaves remain green all year forming a rosette about six inches across. Another species is the very small *Lewisia nevadensis*. With small white blossoms and quill-like deci-duous leaves, it is my favorite form.

The Intermediate Bearded Irises reach the limit on height in the garden so only a few are grown in the rock garden. My favorite, 'Az Ap', is a very nice pale blue. Although it is not a real fast multiplier for me, the foliage does remain very clean during the growing season.

*Allium karataviense* is a striking plant both in flower and foliage. The white flowers make up a ball about the size of a softball yet it is only nine inches tall. The leaves are blue and very wide. Its only fault lies in the fact that the leaves disappear by the end of June. Planted behind a low rock it makes such a striking addition that it is really worth trying.

Of the many plants that put on their floral display in the summer, I think no rock garden should be without a number of campanulas. These wonderful, long blooming plants with bell-like flowers provide an abundance of color until frost. *Campanula carpatica* var. *turbinata* is a low plant, only growing to about four inches. It has flat light blue flowers with whitish centers. *Campanula nitida alba*, a nine inch beauty with white bells, a *Campanula persicifolia* alba in miniature. *Campanula glomerata* var. *acaulis* is four to six inches tall with upward facing bells in abundance at the tip of each stem. I grow this in both a blue and white form.

I find that combining different compatible plants can add a great deal of form and texture to any garden. I enjoy growing many kinds of plants together, not only in the rock garden, but in my perennial borders as well. If you are in the area, you are more than welcome to visit my gardens. Maybe we can share a few ideas.

MDB = Miniature Dwarf Bearded; very short: under 8"

SDB = Standard Dwarf Bearded; taller ideally 8-10"

IB = Intermediate Bearded; taller yet: 15-18" ideally

*Leo Blanchette Jr., Carlisle, MA wrote this piece originally for the American Iris Society Bulletin, January, 1988.*



# Ethical Scrounging

Morris West

A great deal is written and said about the ethics of collecting plants in the wild. It would be appropriate for the ARGS to take an official position against the collection of rare or endangered species, unless officially sanctioned as a rescue operation. Members should avoid the purchase of wild collected plants from nurserymen. Except in cases of eminent habitat destruction, no more than a very small percent of the plants in a natural stand should be collected. Many rare and endangered species are difficult or impossible to maintain as garden plants, and it is hard to believe that ethics would take a front seat if a nurseryman is confronted with a choice between high sales and limited collection.

Let me make one thing perfectly clear — I'm a collector. I have no qualms about taking the small mats of *Epigaea repens* that seed along the shaded banks of the township road. They never escape the snowplows for more than a few years unless saved by a collector. Regardless of what you might read these are easy to transplant when young.

In many western areas one road grader will scrape away in a single day more alpenines than

the entire membership of the ARGS would collect. I have seen thousands of mats of *Phlox hoodii* and clumps of *Aster alpigenus*, *Erigeron compositus*, *Aquilegia jonesii*, and numerous *Penstemon* sp. obliterated in a few hours time. In the northeast an entire rich and diverse woodland can, in a matter of days, be replaced by acres of asphalt. Road maintenance destroys only the edges of vast fields of alpenines or small colonies of eastern woodland plants, but parking lots totally annihilate the entire flora. Rather than discouraging collecting in such areas, it would be ideal if local, state, and federal bureaucracies officially publicized and encouraged collecting in areas slated for habitat destruction. Unfortunately the normal procedure never assesses potential damage to an area much less sponsors an environmental impact study.

Let's be ethical scroungers and:

Not collect rare and endangered species (except to rescue).

Not buy plants from nurseries that collect rare and endangered species (just those that propagate).

*Morris West, Brogue, PA, is a frequent contributor to the Bulletin*

# Calanthe Orchids of Japan

Yoshitaka Iwata

Over the last ten years a great enthusiasm for wild orchids has been growing among the mass of people in Japan. When giving a full account of the Japanese *Calanthe*, however, you will be amazed at the diversity of flower color of plants, few ever seen in publications.

In distribution plenty of habitats can be readily seen through all Japan, from Hokkaido to the Southwest Islands, filled with a lot of different woodland orchids in which several species have been highly appreciated by large numbers of people. Some orchids cultivated most commonly are *Cymbidium goeringii*, *Cymbidium kanran*, *Cypripedium japonicum*, *Calanthe*, *Ponerorchis graminifolia* and far less frequently met with, *Cypripedium macranthum* var. *speciosum*. Among them the *Calanthe* orchid holds a special position in the orchids of Japan, which include approximately 77 genera with over 308 species (occasionally the decision of genus markedly varies among taxonomists). I have often noticed many flower lovers find this more attractive than any other wild orchids. This results from the gracefulness of flower form and the abundance of coloration, *Calanthes* are for

the most part only to be seen in the wild where perhaps they have learned to love it. Hence, at present this beautiful orchid is extensively loved by many orchid lovers in the country and I suppose it still ranks first among the most popular in all the native orchids.

Parallel with this, habitat destruction resulting from development is the largest single factor in losses of our native orchids which are especially under intense pressure. So the reason we planted seedlings cultivated artificially in a nursery of the institute was that we not only hoped to continue researching our native flowers and to grow our own wild flowers but we also could not bring ourselves to take them from their native habitats. The business of collecting wild flowers has been a good one for many years in Japan. However, a reasonable requirement of natural conservation is that wild collecting is not always a matter for congratulation today.

*Calanthes* mostly remind us of ground orchids (terrestrials) that root in the earth, except for a few epiphytes. Kinds most common in cultivation are terrestrials, both deciduous and evergreen *Calanthes*. It should

be noted that most of evergreen *Calanthes* of the temperate regions in the northern hemisphere are widely distributed plants which mainly occur in East Asia, spread from the southern foot of the Himalayas through the south part of China to Taiwan and Japan. This orchid grows in evergreen and/or deciduous woodlands where the several kinds involved include, in Japan, fagaceous oak, beech, chinquapin of the temperate or subtropical zone, *Camellia*, *Cryptomeria*, *Chamaecyparis* or *Phyllostachys* and tends to occur on the belt of the big amount of rainfall where the climate is relatively calm and the range of temperatures is from 0 degrees C to 30 degrees C.

Most species of this genus put many medium-size flowers on a flower stalk and are lovely with the wide range of coloration, but regrettably less showy than *Cattleya*. Most, but not all, *Calanthes* are not so deep and glaring in color as many epiphytic orchids of the tropics. Although those tropical orchids have decorative qualities, graceless individual flowers can be frequently seen there. Curiously enough, in Japan, there are few kinds of terrestrial orchids with queer and odd flowers, especially *Himantoglossum* and *Ophrys* only occasionally seen in Europe, and *Diuris*, *Corybas*, *Caladenia*, which occur in Australia and New Zealand. In general, of all

Japanese orchids, many members of *Calanthe* have the most graceful appearance. Each species mostly has many middle tones and creates marvelously complicated colors together with both perianth lobe and lip. Of all Japanese floras some *Calanthes* have developed most in the botanical evolution. The reasons this genus had many species and flower colors depends on Japan's location in East Asia, its island isolation, adaptation to the Japanese rainy climate and the help of insects in such surroundings. Some botanists report this orchid has markedly ecological features in flower color and variation.

The seeds from *Calanthe* are 1-2 millions rather than in thousands per pod. The actual number within one capsule varies with both species and the vigor of the individual plant. The seed is boat-shaped and consists of an outer, transparent, netlike testa and an inner, undifferentiated mass of cells. The tiny seeds, waterproof at the time of distribution, are so light that they can be carried far and wide by the wind when the ripened capsule eventually splits. If the seed lands on a favourable environment, germination can occur. But owing to low nutriment and lack of a mature embryo, many seeds are lost because they cannot reach ground where suitable conditions make germination possible. If the seeds grow suc-





*Pulsatilla alpina*



*Pulsatilla alpina* var. *apiifolia*



*Calanthe x koozu*



*Fritillaria ojaiensis*



cessfully, the undifferentiated cells then form a chestnut-shaped mass of tissue, the protocorm, from which the rhizome grows upward toward light, and develops green coloring when it feels light. It throws up its first leaves and starts the photosynthetic process that manufactures food for its growth. However, it has not been so far clearly demonstrated how the germinated seed obtains food before much development can take place. It is highly probable that nutrients in the surrounding medium and those supplied by fungus are utilized until the plant establishes normal production of carbohydrates by photosynthesis.

The seedling *Calanthe* can be brought to flowering maturity in about 5-8 years after germination with spring flowering. If optimum conditions for growth are provided, years can be deducted from the time it takes this to start flowering in the wild. The Japanese *Calanthe* include 18 pure stocks and 8 hybrids by natural crossing. Twelve pure stocks and 8 hybrids are generally cultivated as flowers and ornamental plants. The following are species very worthy of cultivation:

#### Spring Flowering Species

- C. amamiana*
- C. aristulifera*
- C. discolor*

- C. discolor* var. *tojunoshimensis*
- C. izu-insularis*
- C. sieboldii*
- C. tricarinata* var. *torifera*
- C. x bicolor*
- C. x hizen*
- C. x ishizuti*

- C. x kibanakirishima*
- C. x koozu*
- C. x satuma*
- C. x suisyu*

#### Summer Flowering Species

- C. alpina* var. *Schlechteri*
- C. furucata*
- C. masuca* var. *longicalcarata*
- C. nipponica*
- C. reflexa*
- C. x ryukyu*

#### And Several with Mainly Botanical Interest:

- C. danidii* var. *bungoana*
- C. formosana*
- C. japonica*
- C. densiflora*
- C. hattori*
- C. mannii*

Most *Calanthes* require a moist site under evergreen or deciduous trees which protect them from frost and harsh winds in winter and extreme temperature from the glaring rays of mid summer. This orchid also adjusts its growth by a difference of temperature: when it starts to fall, a winter bud begins to grow large and when rising, it begins to throw up leaves. In pot culture



this genus should be grown in temperatures close to naturally optimum conditions. If temperature control is not maintained, a winter bud bursts into flowers or just begins to move after normal flowering time.

Previously, it was generalized that to grow roots in orchids is very important, because roots and leaves only occur once in a year. This also applies to *Calanthe*; providing that it has healthy roots and two or more leaves, it comes into flower without fail. In pot culture fertilizer and water should be restrained as much as possible, because they are likely to cause root rot. On the whole watering should be done when the surface of the compost in a clay pot began to become white. As a general rule, for *Calanthes* which like air and never experience prolonged periods with their roots in stagnant, waterlogged soil, a medium with sufficient air permeability is recommended. There is generally no need to water those planted in the garden.

*Calanthes* usually flower without fertilizer. When necessary for growth, a little liquid or solid organic fertilizer (such as rape cake and bonemeal) should be given once in spring or fall after flowering. Where the duration of sunshine is quite plentiful, a reed screen for shading prevents leaf scorch.

For breeding, five funda-

mental stocks, *C. sieboldii*, *C. izu-insularis*, *C. tricarinata* var. *torifera*, *C. discolor* and *C. aristulifera*, are normally utilized with the first three species presently most used. Most hybrids last longer and are stronger than species and are relatively easy to cultivate.

Hybrid seedlings take 7-8 years to bloom and excellent selections are scarce and very high-priced.

There are many events in Japan which feature wild flowers and orchids, most having propagated plants for sale. In addition, there are more than one hundred thirty shows of *Calanthe* per year in Japan by people who specialize in them. Excellent selections are registered through the screening system of the Japan *Calanthe* Preservation Society. Lately, each new cultivar formally registered has been classified by Gold Medal, Silver Medal or Bronze Medal. Hybrids and species are much photographed and those widely published in magazines.

## Key to the species of *Calanthe*

1. Flowers without a spur or having a bit.....3  
 Flowers having a spur .....3
2. Perianth lobe very fleshy, flat or fair in bloom,  
 flowers almost greentricarinata var. torifera  
 Parianth lobe all turned backward in bloom, flowers white,light  
 purple ..... *reflexa*
3. spur ordinary or short .....6  
 Spur very long .....4
4. Inflorescence not glove-shaped, flowers white,  
 light purple, pink, with sweet fragrance ..... *izu-insularis*  
 Inflorescence definitely glove-shaped, flowers white  
 or purple, without fragrance ..... 5
5. Spur curved extremely obliquely downward, longer than  
 peduncle and ovary ..... *masca* var. *longicalcarata*  
 Spur curved a bit obliquely downward, recurved upward at.....  
 apex, normally shorter than peduncle and ovary ..... *fulcata*
6. Lip well-developed, with definitely 3 protuberant lines in the ..  
 middle lobe, flowers yellow ..... *sieboldii*  
 Lip normal or small in size .....7
7. Lip entire, cup-shaped, shallowly erose-toothed  
 at its margin ..... *alpina* var. *schlechteri*  
 Lip 3 lobed .....8
8. Leaves small, linear-oblong, approximately 2-6 cm wide,  
 with definitely parallel veins, inflorescence sparse ..... *nipponica*  
 Leaves large, elliptic-oblong, elongate, scoop-shaped ..... 9
9. Plant with small or large leaves in adult form ..... 10  
 Plant without the difference in adult form ..... 11
10. Leaves upright, reflexed..... *aristulifera*  
 Leaves prostrate, not reflexed ..... *discolor*
11. Flowers relatively small, predominantly white to pink,  
 without fragancia ..... *amamiana*  
 Flowers medium flowered,  
 fragrant ..... *discolor* var. *tokunoshimensis*

*Yoshitaka Iwata is with The Institute of Forest Plant Research, 14  
 Mineoshikowa, Kyowa-Machi, Senboku, Akila 019-21, Japan.*

# Bottled Sunlight

Milton S. Mulloy

In the fall of the year, bottled sunlight is a welcome commodity. Without the annual pageant that spreads "Persian Carpets" broadcast in late September and early October across our northern hills and mountainsides, the inexorable advance of lowering cloud, of chilling squalls and falling temperatures would become scarcely tolerable. We should all have to follow the birds to Florida.

As it is, hundreds, thousands of "leaf-peepers" annually forsake their asphalt jungles to trek to and through our treasured landscapes, to feast their hungry eyes and, with luck, return home in one piece, presumably refreshed by all that they have briefly glimpsed. Rather more fortunate are some of us who can look out our windows and discover that bottled sunlight spread close at hand, or find it flooding into a favorite room, illuminating every corner and crevice.

Long ago I succumbed to the charms of Japan's *Acer palmatum*, whose *A.p.* 'Crimson Queen' now shines below, currently an almost scarlet spotlight against the lawn. For our native swamp (or red) maples,

our sugar maples, and their immigrant cousin from Scandinavia I have less enthusiasm. Seasonally gorgeous in their places, they shine supreme. But their places are not in my garden — except, alas, that they were here before us, and so we find them easier to suffer than to remove. To give the devil his due, one of these tolerated monsters daily lights up a bedroom with its reflected glory, in green and gold. On any gray clammy morning that is a welcome dividend, and to some degree is compensation for the ever-hungry questing surface roots.

Out another window are other bonuses. Looking down on a small rock garden, shaped inadvertently like South America on a map, I find cheer in the varied russet shades of *Prunus pumila depressa* that, finally, has consented to live with us. Close by are the bright pinks of fall — blooming sedums: *Sedum Sieboldi* and *S. caudicola*. Each has already paid summer-long ground rent with its gray-green bullion, whereby these late-coming blooms now give added cheer and sunny warmth to offset the



grim, pervasive gray overhead. Add to the scene fall-blooming crocus. They underscore the much that we have long missed until we smarted up a bit. Sundry shades of purple and lavender are not really personal favorites, but they too make welcome autumn contributions. *Serratula Shawii* (with a new name, I hear — *S. Seoanei*) a treasured gift, increases yearly to provide composite tufts of color when most needed and appreciated. In late August through to late October it is a foil to the evanescent golden coins of a small *Oenothera* of pleasantly biennial and fecund habit. Purple and gold, too, are the humble — but so reliable, hence accepted — “Johnny-Jump-Ups.”

If your resources for perennial late-summer-to-late-fall color are slim, don't let disdainful commentary from the worshippers of la Creme de la Creme dissuade you from recourse to discreet investigation of annuals. If gentians avoid you, what better blues (in mid-summer, too) than some of the annual Lobelias? Or for late fall reds, pinks and whites, there are for experiment verbenas of easiest culture. Bottled sunshine, indeed!

Admittedly this talk of annuals is heresy. But so be it. It

is color when we most need it. So enjoy, enjoy! Faced with the long, inexorable descent to the drab and dull of winter blahs, I make no apologies. Grab color, variety and cheer wherever you can find them.

In the burgeoning days of spring glory, cheer, color, and variety abound on every side — even, in extremis, to satiety. To that, green, green, green of every sort and hue and tone gives welcome, though temporary relief. For after the feasts of April, May and early June comes the famine of mid-summer's nothing-but-green. What was, a few weeks back, a pleasant rest for bedazzled eyes becomes a wearisome sameness — unless you have taken forethought.

The elfin pink spikes of *Scilla chinensis* (it too has a new name that escapes me), (*S. scilloides*) come in mid-August here in West Central Connecticut and stand until early October, always pleasant without shouting. Similarly and of even longer duration, the recurring pink or white stars of *Tunica saxifraga* (*Petrorhagia saxifraga*) spangle their green mounds from mid-summer onward until frost conquers all. This, too, is an especial delight in its double form, if you can find it.

There are still other stores of

bottled sunlight to reward the hunger. Consider the low, spiky dome of the bulbous oat grass. In shining white and green, it has a horrendous name — *Arrhenatherum elatius bulbosum*. Bright from spring well on into mid-summer, when it tires; then having been cut back, it rejuvenates itself most satisfyingly even through the early light frosts. Of somewhat similar effect, but more spiky than domed, *Yucca filimentosa variegata*, in cream and green will give you color year round. But be prepared to move it when it outgrows its appointed place in your scheme of things. I am reminded belatedly, as to grasses with color, that on no account should one overlook the well-named Japanese blood grass — *Imperata cylindrica rubra*. It is indeed blood red and gorgeous, especially when back-lighted by late afternoon sun. It is said to grow to two feet, but mine on a lean, north-facing slope stays at about a foot. Some have questioned its hardiness. Mine has survived two winters without protection, and comes through beautifully each spring, thereafter to shine steadily until the hard frosts cut back all. A superior form of this charmer is well illustrated as the centerfold of the November '88 issue of *Horticulture*.

More frost-sensitive but of golden-belled splendor at the woodland edge comes September-blooming *Kirengeshoma palmata*. It is now gone, while the tiny leaflets of the nearby locust tree drift down in showers of golden snowflakes to become ultimately minute scraps of mulch. The frosts too have beset the aging leaves of inherited rather ho-hum Hostas — even so, their old gold serves to define the limits of our labors. They serve too as reminders that there are now available Hosta forms that are quite superior in bloom to the mine-run of the tribe — the more so that theirs is another September-October performance, well worth remarking when color is much to be desired. Try *Hosta tardiflora* and *H. 'Rock Princess'*, well fed for the late season.

Autumn color is where you find it. Drink deeply of this bottled sunlight, for it is soon gone. Enjoy — enjoy — and remember: in December, even a dandelion is not to be spurned!

Milton S. Mulloy, is from  
Cheshire, CT

# The Exchange

**WANTED:** Sources for *Taxus baccata aurescens*. If you can help, please contact Eleanor Friedlander, 6 Baldwin Circle, Weston, MA 02193.

**WANTED:** Sources for bulbs of *Arisaema urashima*, *Paris japonica* (sometimes found under the name *Kinugasa japonica*), and *Calochortus* species, especially lantern types, but any and all will be welcome. Have several ideas on how I might succeed with *calochortus* as they are one of my favorite flowers, and I am very determined.

Second, I am desperately seeking advice for a way to really curb the devastation sow bugs or pill bugs perpetrate on my garden. They are my worst garden enemy. I try to avoid pesticides. Are there any of nature's own that enjoy devouring these pesky little armadillos?

Third, as a fairly new adventurer into the wonderful world of growing rock garden plants from seed, I think it would be most helpful if anyone having success with more difficult seed would be willing to write a few lines to The Exchange detailing the medium (soil, spaghnum, etc.) used to start the seed, the method followed (refrigerated, overwintered outside, or merely planted), when (immediately after ripening, elapsed time as

in seed exchange), what medium the seedlings were potted-on in, garden conditions when finally put outside (shade, sun, acid, calcareous), and how long seedlings were pampered before placing outside to fend for themselves. (Mrs.) Phyllis Gallup, 1437 Catalina, Anna Arbor, MI 48103

## Help Needed:

I have bought several good-sized pieces of Tufa. What plants can I grow in it? How large do the holes drilled in Tufa need to be? What about soil?

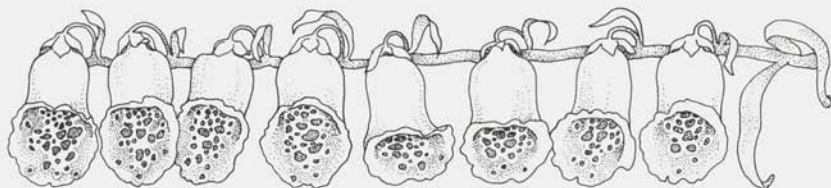
Mildred Barlow, 91 Front St., Merrimack, NH 03054

## LETTER

I would like to thank Helen White for her comments on *Thlaspi arcticum* and the Arctic National Wildlife Refuge (ANWR) in the Summer 1988 Bulletin. Without going into any of the many environmental reports issued by nonprofit organizations and the federal government, suffice it to say that for once Congress has gotten the message and has decided that, for the time being at least, there will be no oil drilling in the ANWR. Thanks to all of you who wrote letters to your politicians.

Ronda Engman





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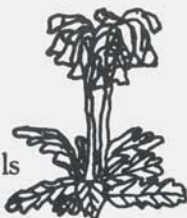
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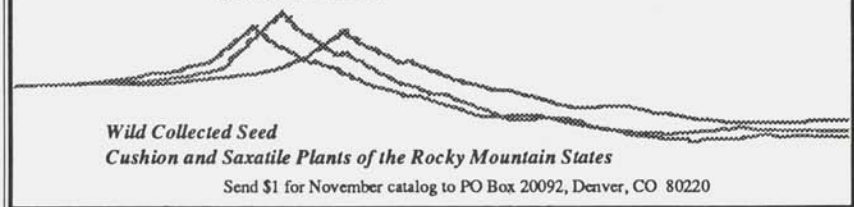
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