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(Alpine Garden Club of British Columbia)
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Annual Meeting (Delaware Valley Chapter)
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Cover Picture: *Campanula piperi*, endemic to Washington's Olympic Mountains (page 175) Photograph by Lon and Florence Free

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Mount Townsend

Dennis Thompson
Seattle, Washington

(This article is compiled from worksheets prepared by Marvin Black, Dan Douglas and me between 1975 and 1985. In general the best floral display has been mid-July although the trail is usually accessible between the first of June and the end of September. We have collected seeds on the saddle as late as the first weekend in October.)

Mount Townsend is one of the lesser-known peaks of the Olympic range. Unlike the major tourist attractions of Hurricane Ridge and Deer Park to the north in the Olympic National Park and the Hoh rainforest to the west, Mt. Townsend is on the dry side of the Olympics. While the west side of the range receives up to 200

inches of moisture a year by some reports, the lower east side may receive as little as 5 inches.

Though in a portion of the rain shadow, the lower Townsend area forest receives enough moisture to support the water-loving *Abies grandis* and *Tsuga heterophylla.* Mount Townsend is not readily marked on maps or by road signs. Even in the small town of Quilcene at the base of the mountain few people seem to be aware of the trail's existence. There have never been over-crowded parking lots and only a few off-road vehicles have been seen ripping up the wilderness in 11 years of observation. Forest Service signing includes "Not Open to Automobile Travel," which, once you get used to the idea that the roads are really passable and open to the public, simply discourages the less intrepid.

The summit of the trail is the highest rise on a rolling meadow and scree ridge about 100-300 feet above timberline. Below this ridge are the last krumholtz of *Pinus contorta, Abies lasiocarpa,* and *Tsuga mertensiana.* This summit is due west of Quilcene about 8 miles. The Big Quilcene and the Little Quilcene rivers arise on its slopes. About 5 miles southwest of Townsend toward the interior is the frequently mentioned Marmot Pass which is about 3 miles north of Mount Constance.

To reach the trail, head out of Quilcene past the fish hatchery 1.4 miles. Turn left on Forest Service Road 2812 and drive 13.5 miles. Avoid turning onto any of the more important-appearing side roads until the junction with F. S. Road 2764. Turn left and wind on about 1.5 miles to the parking lot at the end of the road. The trail begins here at an elevation of 3600 feet and rises almost 3000 feet in just over 3.5 miles to the summit saddle. It is a good climb. On the last climb I led Kitty Swartz announced that she was going to the top that day to celebrate her eightieth birthday. She made it fine. Others have chosen to spend more time in the lower areas often exploring Windy Camp or some of the lower meadows. As a general rule we climb to Windy Camp for lunch and explore the alpine areas later. Even though we are on the drier side of the Olympics, there are often fogs and sprinkles in the afternoon, even in July. They can come up suddenly. It is best to pack some light weight rain gear. If there is no breeze around Windy Camp, we also have a chance to meet some of Washington's voracious wildlife, the Olympic mosquitoes. The streams, while beautiful and cold, should not be used as a water source untreated.

Why would anyone want to find a mountain that not even the natives know about, to walk over 3 miles, climbing about 3000 feet, to possibly be rained upon or attacked by mosquitoes where it's not even safe to drink the water? Mount Townsend holds one of the greatest varieties of common, rate, and endemic mountain plants

of any mountain area in the Pacific Northwest.

The trailhead is in typical high woodland. The forest includes *Pseudotsuga menziesii, Tsuga heterophylla, Thuja plicata,* and *Abies grandis* with occasional *Acer macrophyllum, Alnus rubra, Prunus emarginata,* and *P. virginiana* var. *demissa.* This is one of the few areas I have found where populations of *Acer glabrum* var. *douglasii* and *A. circinatum* are commonly found interspersed. A number of the plants appear to exhibit intermediate characteristics.

Under the trees in lighter areas are *Gaultheria shallon,* and at the upper reaches of the zone, *G. ovatifolia, Rhododendron macrophyllum, Rubus parvifolius, Berberis (Mahonia) nervosa, Sambucus racemosa, Ribes lacustre,* and *Rosa gymnocarpa.* Several of the *Rubus parvifolius* have fringed petals. Two huckleberries, *Vaccinium parvifolium* with red berries and *V. membranaceum* with blue-black berries, are found.

The woodland floor for about the first 1 1/2 miles is thickly carpeted with herbaceous shadedwellers: *Achlys triphylla, Actaea rubra, Oxalis oregana, Cornus canadensis,* and the subshrubby *Linnaea borealis.* In the upper areas of the woodland zone these are replaced by *Rubus lasiococcus, Asarum caudatum, Mitella trifida,* and *Parnassia fimbriata.* Stretching above these lower groundcovers are gracefully arching *Smilacina racemosa, S. stellata, Aruncus sylvester,* and the rarely seen lily *Stenanthium occidentale.* The small, waxy, mahogany bells are easily missed by the unobservant but offer a delightful shy elegance. *Clintonia uniflora* is common in more open areas. In deeper shade are a number of the smaller Ericaceae: *Chimaphila umbellata, Pyrola asarifolia, P. minor, P. secunda, Pterospora andromedea,* and *Hypopitys monotropa.* The pyrolas I find intriguing, though *P. asarifolia* is the only one with sufficient allure to attract me to the inevitable garden failure. (I find the pyrolas repeat garden suicides when in my care.) *Pyrola asarifolia* has a fragile, rich green, oily-appearing leaf—a true knock-out in dark shade against soft green moss. The pinedrop and pinecap seem left over from Walt Disney's *Fantasia. Pterospora andromedea* rises like clumps of yard-tall cinnamon colored wands. *Hypopitys montropa* ranges from cream to florescent pink in stem, leaves, and nodding flower clusters.

In sunny forest breaks on well-drained soil are the small *Lonicera utahensis, Paxistima myrsinites,* and *Heuchera micrantha.* Some of the forms of heuchera from this area are much more floriferous, looking a great deal like a dwarfed baby's-breath. The honeysuckle is refined in its native habitat but took on a teenage awkward lankiness in the garden. The false boxwood has always fascinated me, but while cuttings rooted readily, I couldn't get it to

establish until Frances Roberson explained that the plant hated root disturbance and that lifting the cutting could be enough to kill the plant. Rooting it in well-drained soil mix and planting the entire pot out seemed to solve the problem.

Any place there is a bit of sun there will be fireweed, *Epilobium angustifolium*. In the sun along moist areas in the woods are *Mimulus guttatus*, and apparently *M. dentatus*, and the tall, pale *Delphinium glaucum*. Where the territory is not both dry and sunny, swordfern, *Polystichum munitum* makes itself at home. *Notochelone (Penstemon) nemorosa* rises in the light shade like some wildling snapdragon—only a few, never a field. Quietly where the shade is the deepest, where only moss and the occasional pyrola survive, is *Goodyera oblongifolia* as happily at home as it is 50 miles away on exposed rocks just above the ocean spray.

Many of the plants which make their first appearance in this woodland continue into upper areas. Both *Viola sempervirens* and *V. glabella* fall into this category. Since *V. sempervirens* is native through the woodlands around Seattle, it is a safe doer for neglected nooks. Perhaps unfairly, that is the value I have always assigned it. George Schenk commented to me on another rock plant at one time, "If it weren't so easy to grow, people would see what a marvelous plant it is." The viola may suffer the same problem. I must admit that I truly love its companion *V. glabella*. I first learned it from the back garden of the taxonomist Helen Gilkey in Corvallis, Oregon. I was told she didn't garden, but her entire yard was the 8-inch-tall yellow johnny-jump-up! It's intriguing how our memories emotionally color plants even in the wild.

About 2 miles up the trail, the woodland dramatically opens into less stable slopes. Trees still form isolated patches of woodland, but the views are now of spectacular ridges up scree slopes and meadows. Many of the plants that first make their appearance here continue into the alpine zone. Larger plants include *Pinus contorta*, *Chamaecyparis nootkatensis*, and *Abies lasiocarpa*. The creeping *Juniperus communis* var. *montanus* tangles with *Arctostaphylos uva-ursi*. Threaded in among the kinnikinnick are two particularly successful garden plants, *Symphoricarpos mollis* var. *hesperius* and the Olympic form of *Potentilla fruticosa*. The snowberry is absolutely prostrate. Mixed with the kinnikinnick it shows fresh green leaves early in the spring and a relatively strong red fall color. The flowers are usually enough buried that I miss them in the garden when so many flowers are in spring bloom, and I've never noticed them in the mountains. About the first of July they develop clusters of small, flattened white berries that last late into the fall. The white berries in combination with the red of the kinnikinnick and then the bright evergreen leaves to cover the de-

parture of the red flash of the snowberry foliage is a combination to thrill a florist. The snowberry grows in Seattle rockeries with no summer care. The potentilla, which was selected by Bob Putnam from Mt. Townsend, grows in very mobile screes. I have not seen any but the prostrate form on Mt. Townsend. The flowers are a light yellow, and the plant is a strong grower in a pot or well-drained soil.

In the scree and meadow slopes, herbaceous material becomes prolific. The plants from the lower sunny areas are joined by *Aquilegia formosa, Anaphalis margaritacea, Arenaria obtusiloba, Aster foliaceus, Cerastium berringianum, Phacelia sericea, Sedum divergens*, and the weedy *Hieracium gracile* and *Agoseris aurantica*. The large carroty *Heracleum lanatum* and lomatium tangle with the daisies of *Chrysanthemum leucanthemum*. Bulbs make an appearance: *Lilium columbianum, Fritillaria lanceolata, Allium amplectens, A. acuminatum* and *Zigadenus venenosus* in the rock. The lily is a more dwarf form than is usually seen, under a foot tall with full-sized flowers. With the strength of growth in most of the area's plants, it seems unlikely that it is simply a starvation reaction. Brian Halliwell took bulbs back to Kew, but I have not heard how they performed there, and I do not know of anyone else who has tried them in the garden. The fritillaria seems happy both here and in the higher elevations. The small-flowered *Zigadenus venenosus* grows well but is a bit dowdy. The onions are interesting and quite growable. *Allium acuminatum* has a small cluster of intense rose-purple flowers. *Allium amplectens* is a narrow-leaved onion that seems confined to this mid-elevation and has papery pink blossoms.

The family Scrophulariaceae is especially well represented. In sunny breaks in the woods *Penstemon rupicola* grows in isolated cracks. In the middle and alpine zones *Penstemon davidsonii* var. *menziesii* and *P. procerus* var. *tolmiei* are frequently seen. *Penstemon davidsonii* var. *menziesii* forms tight mats of rather dense oval serrated leaves topped by clusters of violet-blue flowers, often surmounted by a thin outer skin of purple. *Penstemon procerus* var. *tolmiei* is lankier with larger, more stretched flower clusters of a slaty blue. Because of its more refined character, *P. davidsonii* tends to attract more attention even with its smaller size. *Penstemon rupicola* puts in a brief appearance near the trail head on rock outcrops, but its red flowers are duller than in many of its better forms. Several forms of *Castilleja* make an appearance. They range from golden to fuchsia, red, and orange. The closely allied *Orthocarpus imbricatus* joins in with straw-colored inflorescences. One of the dwarf yellow mimulus peeks out in wet locations in the lower zones. The softly pinkish-lavender heads of *Pedicularis*

racemosa also put in an occasional appearance beside conifer groves. The plants have a slightly awkward appearance; perhaps it's only that their entire leaves are less spectacular foils for the flowers than the more feathery, deeply-dissected leaves of other species.

It is really in these breaks into the sunshine that our trekkers begin sorting out. Entomologist, Sharon Collman is generally one of the first settlers, moving into the fields of giant cowparsnip, *Heracleum lanatum*, like the proverbial "kid in the candystore." I readily admit that their clouds of insects are probably the most prolific on the mountain—with the possible exception of the mosquitos around Windy Camp. All along the trail it begins to look like a Hollywood war epic: bodies strewn amongst the rocks, but clutching cameras not wounds. There are also the ascenders like Kitty and Phil Pearson and Steve Doonan who are going to reach the cliffs at the top and can't be distracted by things at lower levels. George Schenk on the other hand is a quiet stroller in no hurry to reach the top, observing *everything* along the way. Dan Douglas scouts side areas, locating one of the two colonies of *Lewisia columbiana* var. *rupicola* we have found to date. Unlike the elegant form named by Carl English from Saddle Mountain in Oregon, the Olympic plants have spathulate leaves of pale green remaining trunkless like forms from the eastern range, but the flowers are blush pink rather than white striped pink. There is no intensity of cerise as in the Saddle Mountain material.

The rock clingers are common through the cliffs of this area. There are two mat-forming silenes here, *S. douglasii* and *S. parryi*. Both are rather pallid in show, greenish white to mauve, although *S. douglasii* may attain some quite brilliant colors upon occasion. I am more attracted by some of the smaller crevice dwellers. *Solidago multradiata* var. *scopulorum* is a tiny goldenrod. The form on Mt. Townsend is often under 4 inches tall with vivid green leaves and sunflower-yellow rayed flowers. Another daisy, *Senecio flettii*, is about the same stature to about 8 inches with a compact cluster of globose yellow heads. *Erigeron flettii*, an endemic, forms clumps of large white flowers that are held about 2 to 5 inches above the ground over forest-green foliage. *Erigeron compositus* var. *glabratus* varies between button flowers and daisies. The leaves are attractive in all cases and dwarf daisies an inch above the rock are spectacular. *Viola adunca* shows up in this area. Compact and showy, the purple flowers are usually found crouching in the shelter of rock in almost full sun.

This area includes a number of good forms of rock garden shrubs. *Artemisia suksdorfii*, *Cassiope mertensiana*, *Luina hypoleuca*, *Phyllodoce empetriformis*, as well as the arctostaphylos,

potentilla, and vacciniums mentioned previously. *Luina hypoleuca* is reminiscent of a miniature *Senecio* 'Sunshine' (*S. greyi*) with lemon-colored rayless daisy flowers. It is growable in a scree situation in Seattle gardens but rarely seen. The cassiope and phyllodoce are grown by ericaceaeophiles.

There are several ferns dwelling among the loose rocks. Moving from the shade of the lower zone into the rocks of the mid-elevation is *Polystichum munitum*. In the loose scree is a colony we have labelled as *Polysitchum ? lonchitis*. *Cryptogramma crispa* forms fringe around the loose stones. In the shade of the lower zone there are lycopodiums and selaginellas. *Selaginella oregana* will even occasionally venture into the scree. *Athyrium filix-femina* and *Blechnum spicant* are common at low elevations.

The lunch stop, Windy Camp, is at the lower edge of the alpine zone. There is a small lake surrounded by sub-alpine conifers. In the lee of the trees there are swatches of sub-irrigated soil populated by *Parnassia fimbriata, Trollius laxus var. albiflorus, Salix arctica,* and *Sorbus sitchensis* var. *grayi*. It is from this point up that there are frequent breezes and occasional fog and showers.

Assuming that people have made it this far and consumed their meal before the mosquitoes consumed them, the most exciting plants are now at hand. The trail steepens, the rocks are looser and the trees quickly disappear.

Just above the lake is the pale pink *Pedicularis racemosa*. *Penstemon procerus* var. *tolmiei* is of a very good form here and *P. davidsonii* is compact and seems to become better and better as the saddle is approached. In the loose talus slopes are *Delphinium glareosum*, a blue larkspur and budded mats of the Olympic aster, *Aster paucicapitatus*. The *Abies amabilis* and *A. lasiocarpa* have great skirts of krumholtz usually edged with masses of alliums, *Zigadenus elegans, Douglasia laevigata,* and the first *Campanula piperi*. The rarely seen *Oxytropis campestris* and *Smelowskia calycina* put in an appearance near the saddle. The cracks in large rocks become a major habitat. All plants seem to reduce in size and to mingle, making small gardens. *Douglasia laevigata* var. *ciliolata* sports pale purple flowers and *Epilobium glaberrimum* produces a shocking display of fuchsia-colored flowers over short-trailing stems of blue leaves. The magenta *Hedysarum occidentale* is mixed with the orange of *Castilleja miniata* and the gold of *Eriophyllum lanatum*. Nearing the saddle, *Phacelia sericea* adds its purple to the mixture, and the elegant, large-flowered *Zigadenus elegans* appears. The miniature *Viola adunca* var. *bellidifolia* adds more purple and *Erysimum arenicola* contrasts with brilliant yellow. *Saxifraga bronchialis* var. *vespertina* and *S. caespitosa* dangle from these cracks and *Campanula piperi* emphasizes the frac-

tures with evergreen leaves and staunch blue-purple flowers. Occasional plants are the felty white *Synthyris pinnatifida* var. *lanuginosa*. Long past bloom, the ever-silver tufts create the feeling of miniature snowy parsley.

Above the saddle to the right about 200 to 250 yards are larger populations of the *Synthyris* and a marvelously compact dark green *Arctospaphylos uva-ursi*. There are also extremely good dwarf forms of two daisies, *Erigeron flettii* and *Erigeron compositus*. My favorite was always the dissected leaf *E. compositus* which has variable daisies from rayless buttons to graceful white daisies very much like *Bellis perennis*. Marvin preferred the *E. flettii* with entire leaves and larger white flowers. A particularly short-stemmed form was propagated for several years by Bob Putnam at The Plant Farm. The *Potentilla fruticosa* which Bob also propagated as the 'Olympic Mountain Form' is common in the lower elevations, but in the talus fields ascending to the rock outcrops, the plants are ancient, contorted, and dwarf--ideals of bonsai. Here and there in more stable areas is the diminutive *Viola adunca* var. *bellidifolia*. In less stable areas near the outcrop, there are marvelous patches of *Elmera racemosa* looking like an elegant fringed heuchera. On a good slide you can actually observe 3 to 4 distinctive forms before skidding to a stop on a rocky brink.

Back to the saddle and farther east about a mile, you come to cliffs of rotting rock studded with *Petrophytum hendersonii*, *Silene acaulis*, and a dwarf willow, *Salix arctica*, about 7 feet in diameter and an inch tall. *Saxifraga oppositifolia* clings to vertical rotting faces of walls. Swales of *Lupinus lyallii* (*L. lepidus* var. *lobbii*) carpet the more level areas and the dusty rose blooms of *Geum triflorum* var. *campanulatum* overhang them. The trick at this point is to remember that it is about an hour down to the parking lot—though I have to admit that sunset on the ridge with a bottle of wine is well worth the forced trek in the dark. It provides the memories that warm drab and lonely moments with "remember when..."

(The author has provided a comprehensive plant list of this area. For a copy, you may send a stamped, self-addressed, legal size envelope to S. Sutton, P. O. Box 1371, Port Townsend, WA 98368.)

Trillium Antics

Edith Dusek
Graham, Washington

In addition to those deviations which might be considered to be within the normal range of trillium activity, one finds others in which the flair for doing something different is carried to extremes. Some of these are no more than normal patterns carried to unusual lengths. Others are complete departures from the usual ways of doing things. Some are not particularly attractive while others can be extraordinarily beautiful. There are several general plans of departure from the norm, any of which may occur independently or may be variously combined. In all cases the deviations occur in three versions: They may be accidents of the one season only; a given plant may have a tendency to produce the deviation, but not on a predictable basis; or a plant may be permanently fixed in its peculiarities. Since the appearance of any of these three forms may be the same, the only way to tell one from the other is to grow them under optimum conditions for several years.

Among the several species of western *Trillium*, the usual thing is to find such deviations scattered very thinly through the population with the incidence of oddities varying only slightly from stand to stand of that species. Some species such as *T. parviflorum* (which varies only rarely in the ways discussed below) and *T. rivale* (which for the most part confines its efforts to color variation) have a very low incidence of extreme variations. In others, the incidence and distribution patterns seem to be roughly the same. In what appear to be exceptional cases, deviant forms will be found to be common in very restricted areas. The author found such a swarm of *T.* x *oregonum* along a small stream and a friend reports that some years ago a swarm of variously double-flowered *T. ovatum* were to be seen in an area which is now a parking lot.

It must be understood that any of the deviations discussed are by no means common anywhere. In a company of rarities, some are just a little more apt to be found than are others.

Perhaps the first odd forms to be noticed are flowers with misplaced color. In these, portions of one or more structure will have taken on a color and size which is generally associated with another. One sees flowers with one or more petals (very rarely all of them and even less often in an even pattern) which have one or more green stripes. Conversely, one or more sepals will be partially

or wholly white. The impression one gets is that somehow material from one structure has appeared in another. In either case the errant material more nearly conforms in size to the structure whose color it has than to that of the structure in which one finds it. Where petals are involved, the green mark(s) are generally broadest at the edge of the petal, diminishing as it passes inward. Generally it does not extend to the base of the petal. The petal edge shows a modest but usually detectable constriction in the green area. White portions in what should be a sepal often show dramatic increase. Flowers have been found in which what should be a sepal is represented by a narrow green keel-like affair with grandiose flanges of white on either side. All other flower components were quite normal.

More often the shift of sepal color and size to petal is much less obvious and may, indeed, be indicated by no more than a very narrow margin on one side. Sometimes confusion about what to put where results in a small thumb-like projection extending from one side of the sepal, or a sepal and petal may team up to form a single structure that is half petal and half sepal. Mislaying of tissue is most often confined to either petals or sepals but sometimes one finds plants in which both are combined. Generally only one of these equivalent structures is involved but two or all of them may indulge in these fancies. To find a plant with anything like a uniform performance in all of the petals or sepals is extremely rare. It is also possible for one or both of these types of deviation to be combined with other forms of variance from the norm.

Perhaps the most obvious difference between these types of western variants and the so-called green mutants which occur in *T. grandiflorum* is that in almost all cases our western plants have flowers that are completely functional, while the grandiflorums may produce pollen but are nearly always otherwise sterile. From the often garbled information available about the grandiflorums, one gets a strong feeling that the same type of variants which have misplaced color in our western species also is found in *T. grandiflorum* and that this portion of the plants behaves just as ours do. What can be nothing more than misplaced color is reported in many of the eastern species, and I have seen examples of it in several species not native to the West Coast.

All plants containing misplaced color with which I have been personally acquainted have been capable of producing seed. Exceptions to this rule are extraordinarily rare regardless of species. It is not only possible but highly probable that the confusion about the so-called green mutant grandiflorums results in their being the forms with misplaced color as well as the sterile types involved in the various discussions. There is a colony in the Southeast which

appears to be producing at least some seed even though the general impression one gets is that at least some of the plants bear a strong resemblance to grandiflorums of midwestern origin, which have been getting something less than rave notices since they are accused of being virally infected "Typhoid Marys."

Green markings on the petals or white ones on the sepals are almost invariably off-center instead of being more centrally located as in the suspect grandiflorums. In all the years that they have coexisted in this garden with more normal brethren of numerous species, there has been absolutely no indication that the effect is in any way passed from one plant to another. Indeed, one curious plant, which has for years produced a single stem with offbeat flowers among all of the normal ones in the clump, never seems to progress beyond this state of affairs. It appears that such a thing is very rare. To be truthful, of all the various plants of misplaced color that have come to the garden over the years, it is an exceptional one which deigns to repeat the hat trick thereafter. The rare exceptions appear to be quite stable in their unstable ways; for it is rare for two flowers in a clump to bear the same markings, and photographic records bear witness to the fact that each year's performance is different from the last. Despite this fickle performance, the plants have no compunctions at all about producing fruits as fully stuffed with plump seeds as any "normal" plant. To date the misplaced color has not been found in any trillium which can be relied upon to produce exactly the same color patterns every year.

The name *trillium* is derived from an inherent tendency of the genus to produce its parts in three or multiples thereof. Dimerous plants in which one whole segment is missing, shift the remaining two into a quite opposite stance. The result is curiously like the propeller toys that delight young children. Examples of this oddity have been encountered in most species of western trilliums. Occasionally the sessile flowered species will produce four leaves with a two-bladed propeller on top, or a plant with a taste for such experimentation may produce some of each of these types among the typical three-part stems. Like the plants with misplaced color, the effect is most often ephemeral.

A most unusual plant of *T. ovatum* was seen having the normal three leaves but only two petals to the flower so fused at the bottom that the flowers were incapable of opening. Short of destroying the blossom, there was no way to count the other parts of the flower, but there were at least enough of everything for a small fruit to result. This particular plant has proven to be one of the "stable-unstable" affairs for its second effort was also not three-part though nothing like the first. Fusion of two parts was seen also in one of the ses-

siles. Here one petal was missing but two of the sepals were permanently fused by a thin white line.

Plants with all parts in fours are encountered reasonably often. Those with five or six parts are much more rare. In the latter case things get a bit crowded so instead of all petals on the same plane, they will be in two concentric rings. In one, the inner petals lay against the outer ones; in the other, the inner petals were held erect in an effect rather like a daffodil. Both were quite pretty. One gets the feeling that such efforts result from a slip-up in timing for almost invariably two stems are produced the next year where there was but one.

True Siamese twinning is occasionally seen. The effect is anything but attractive as two more or less complete flowers are conjoined at the ovary. Despite the inevitable warping of structure, at least one of these monstrosities produced a small misshapen fruit with a few seeds in it. There is a record of a plant which carried out the separation to the extent that two perfect blossoms, each on its own pedicel, were carried above the normal three leaves. Unfortunately, I do not know the fate of this plant.

Sometimes instead of a complete loss or multiplication of one of the normal three units, only one (or more) structure is involved. Probably the best known example of this is the conversion of stamen to petal. It is a simple matter to count the stamens and come to the conclusion that the extra petal has resulted from the missing stamen. Often there are telltale areas of pollen tissue on the erring petal. These may very well produce small amounts of viable pollen. While this is of no moment in plants which have normal stamens also, it is well to remember the fact if one should encounter plants in which conversion of the parts is more complete.

Stamen conversion is generally highly unstable. It has been said that those plants which produce the greatest number of petals per flower are most likely to prove to be stable in form. Unfortunately this is not necessarily true. In my collection, two plants which have in the past produced double blossoms are of a most unpredictable nature. While flowers often contain surplus petals of various size, sometimes there is no more than extra wide stamen connectives to suggest the proclivities of the plants. Petals derived from stamens often have a distinctive clam-shell shape. One plant even went farther and embellished its effort with a variety of ridges and hair-like appendages.

Conversion of the pistil is less often encountered and seemingly is resorted to only when the plant has run out of stamens with which to experiment. If the conversion is complete, obviously the flower will be sterile. However, distorted female flower parts may sometimes be hidden in the proliferation of petals. Handworking

of such unlikely looking structures with pollen taken from pollen bearing petal edges may very well result in the formation of at least a few seeds.

It will be obvious that the conversion of the sexual parts will result in a more or less double flower. The number of petals may be increased by unit duplication also in the same blossom so that an even greater number of petals result. There is still another method of increasing the number of petals which takes place when notching of the petal edges extends to the base of the petal. The notched portions may or may not be rather small. In the finished product of a fully double flower, it is not always obvious just how it was derived. Following the progress of one of the unstable plants as it combines and recombines the various methods in different flowers in the clump, or from one year to the next, can be quite revealing.

Instead of converting to petals to produce a flower, all parts may become sepals. The result is an all green "flower" which remains in good condition almost as long as do the leaves. While not as showy as flowers of a contrasting color, some of them have an elegance of form which is not to be ignored.

Perhaps the ultimate in conversion is the production of what might best be described as a pile of leaves with little indication of floral parts at all. One of my most unusual finds is a plant which had produced a collection of sepals and leaf-like affairs which a touch of white to suggest a petal. The whole was held aloft by a perfectly normal pedicel. The following year the plant showed its displeasure at being moved by omitting the pedicel. Subsequently it went into a spate of division but has retained its habit of producing a stack of leaves. A somewhat similar plant exists in Oregon.

Unusual configurations need not be confined to mature plants. Juveniles of various species have been found with surplus leaves in various configurations. That most often seen is a normal three-leaved effort which has one or more "rabbit ears" standing up from the juncture of stem and leaves. A six-leaved effort with the leaves in two concentric flat rings was rather attractive. Most often these juvenile experiments are never repeated. Plants which are inherently unstable, however, may carry matters a bit farther. Very rarely a short stem will be produced which in turn produces two or more exaggerated petioles; in effect one gets a young *T. ovatum* which looks like a common version of *T. petiolatum*. Recently one of the ovatums got so carried away with its experiments that instead of three extra-long petioles, it made six of them. Four bore single leaves, the other two each ended in a set of three small leaves.

After many years of observations, I am no longer surprised at the antics trilliums can perform. Even knowing that the largest percentage of unusual plants will revert to normal the following

year and that those which do not will be highly erratic in their displays has not dimmed my zest for seeing what the trilliums have been up to each new spring. For among the erring plants there are also those with double flowers which are at least as fixed in their ways as are the more normal single-flowered plants.

Unfortunately no effort seems to have been made to distinguish between the various double-flowered clones which have appeared in trilliums. One finds them listed for the most part as "flore plenum" or "multiplex." The only officially named doubles seem to be two forms of *T. ovatum.* While it is true that both are lovely things, it does not help to keep from oblivion the ten or more other forms of double ovatum which exist or have existed at one time. There seem to have been at least the same number of lovely double-flowered forms of *T. grandiflorum* but none seem to have been honored with names. Doubles have appeared in other species as well but with even less recognition.

In the past any plant forms which did not adhere closely to what was considered to be the norm were swept under the rug as monstrosities by the botanical fraternity. If this had been done with such things as roses and tulips, where would our modern gardens be today? It behooves the gardener to be equally discerning in the matter of our own natives. Genera like the trilliums have such a lot to offer, not only among those plants which are doing what comes naturally but also for the plant breeder who would take these lovely plants under his wing.

Award Winners

Dr. Edgar T. Wherry Award, 1988

Laura Louise Foster and H. Lincoln Foster

In the 15 years since the American Rock Garden Society inaugurated the Dr. Edgar T. Wherry Award for studies of American native plants, there have been only seven recipients. All specialized in limited geographic regions or genera. It is with special pleasure, therefore, that in 1988 we recognize with a joint award the efforts of two horticulturists who have been generalists.

With neither bias nor chauvinism, because they have loved good plants from anywhere in the world, they have taught thousands of us that our native American plants need not suffer by comparison to exotics. It was in 1968, just 20 years ago, that Houghton Mifflin published their book *Rock Gardening, A Guide to Growing Alpines and Other Wildflowers in the American Garden*, in which townsendias and eriogonums, douglasias and trilliums, got equal billing with European gentians and Asiatic primroses. The text was by H. Lincoln Foster, the exquisite and precise botanical drawings were by Laura Louise Foster, and together they changed our lives as well as our gardens.

Linc seems always to have had a garden, but at first his attention centered on trees and shrubs, especially rhododendrons. Gradually, he developed an interest in wildflowers and joined the infant American Rock Garden Society in 1943. In the ensuing 45 years, Linc served the Society as director, seed exchange manager, president, and author, contributing more than 25 articles to the *Bulletin*.

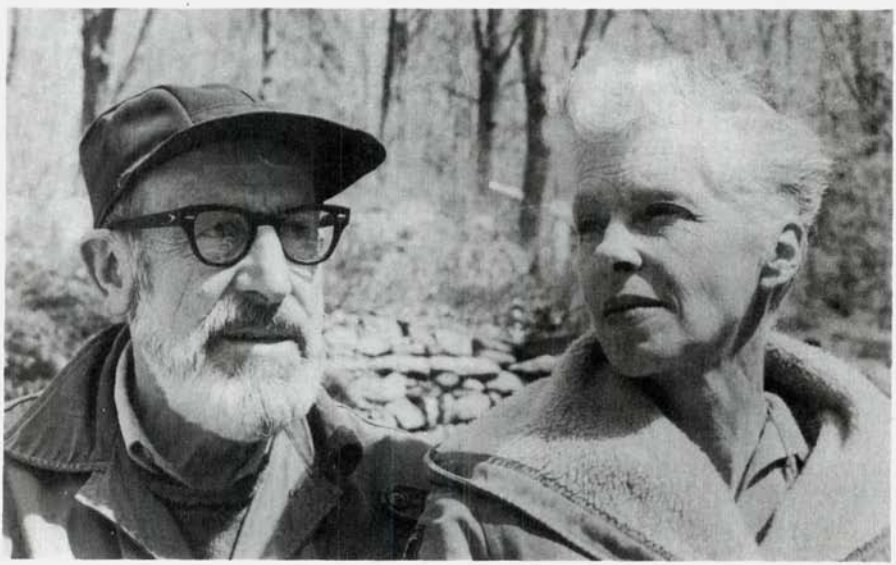
Linc was born, appropriately, in the Garden State of New Jersey in 1906. Following graduation from Williams College in 1928, he began teaching Latin and English in Morristown, New Jersey. He moved to Connecticut in 1937 where, with a colleague, he founded and became co-headmaster of the Norfolk School in Litchfield. After the war, he became involved with forestry, assisting Professor Harold Lutz of Yale University with a botanical survey of the 6,000-acre Great Mountain Forest in Norfolk. In 1949 he married Timmy (Laura Louise), moved to Falls Village, resumed teaching, and work

began on Millstream.

Millstream in Falls Village, Connecticut, is the creation of two loving gardeners. Although Timmy described herself as "just my husband's weeder," the gardens were a joint effort and emphasized their devotion to American plants. When accepting the ARGS presidency in 1964, Linc stated this dedication by underlining the purpose of the Society as "a concerted effort on the part of our members to collect, select, propagate, and disseminate desirable forms of our native American flora suitable for rock gardens."

He and Timmy travelled, collected, and waxed eloquent about native American claytonias, hepaticas, tiarellas, dicentras, shortias, asarums, and phloxes, blending evocative poetry with precise botanical terms. At one time or another, they grew nearly all the "sixty or eighty or one hundred species" of phlox. Invited to Millstream to help sort out the ancestry of the resulting hybrid progeny (which include many of our present garden stalwarts), Dr. Wherry exclaimed, "My, I'm going to have fun here!"

As for Laura Louise Foster, Dr. Wherry had special praise for her illustrations for Cobb's *Field Guide to the Ferns*, in which she broke with tradition by paying special attention to the roots. From then on, Timmy insisted on working from living material, floating rooted specimens in water so that she might better capture both the



Linc and Timmy Foster

structure and the essential posture of the plants. Many of her original drawings are in the archives of the Hunt Botanical Library in Pittsburgh, Pennsylvania.

Born in 1918 in Ohio, brought up "on a sand dune on the southeastern tip of Long Island, New York, within spitting distance of the Atlantic Ocean," and educated at Bennington College in Vermont, Timmy worked as an editor and had no interest in gardening until her marriage to H. Lincoln Foster. "Little did I know what I was getting into. I soon discovered that in marrying Linc I was not only marrying a rock garden, but the American Rock Garden Society."

Her absorption was fast and complete. She not only helped design, plant and weed, she served as editor of the *Bulletin* from 1977 until late 1984. In that time, she diligently sought articles on native American plants from scientists and amateurs alike. By so doing, she broadened our awareness, increased our chances of successful cultivation, and pinpointed areas of fuzziness that she, and all of us, wished the taxonomists would clarify. When Timmy died, too early, last January, she was still delineating plants with both words and pictures.

We have enjoyed their definitive book on rock gardening for 20 years, the gardens at Millstream for nearly 40, as well as a seemingly effortless stream of articles and illustrations praising our very own American flora. Like Dr. Wherry, we have had a lot of fun. It is with gratitude, respect, and love that we award, jointly, the Edgar T. Wherry Award for 1988 to Laura Louise Foster, posthumously, and to H. Lincoln Foster.

—Joan Means

Award of Merit

Howard N. Porter

Sometimes we are a bit slow in recognizing special contributions from a member of the American Rock Garden Society. Today, finally, we make tardy amends.

When a highly educated and whimsical scholar of Latin and Greek, trained at Yale University and for many years professor of these ancient languages at Columbia University, decides to devote himself to horticulture, one can expect not only thorough devotion, but an original and inventive approach.

With a home base in Guilford, Connecticut, and a summer ex-

tension in Maine, Howard Porter leapt into the growing of flowering plants with both nimble feet. In Maine his delphiniums and meconopsis were of first class stature and beauty. In Guilford, he began to experiment with less statuesque beauties, the more occult and difficult the better.

Ranging farther afield, Howard utilized family connections in the Southwest to seek out native desert plants that he and his first wife carried back to New England and nurtured inside the house. Once these began to flourish, his interests expanded to include challenging plants from the Mediterranean.

Still not satisfied, he subscribed to expeditions to Turkey, South America, and other remote places, and thus ventured into raising to perfection seeds from these very different climates. Indeed, other subscribers tended to entrust their seed allotments to Howard so that they might benefit from his propagating skills. He was, in fact, so successful with his seed sowing, that every friend and visitor to his gardens went home laden with rare seedlings from exotic places around the world.

For years, Howard's superbly grown plants took prize after prize on the show benches at Connecticut Chapter meetings, turning his fellow competitors weak-kneed with envy. And if you coveted his

Howard Porter

plants, Howard, always generous, would offer seeds or cuttings from even his rarest specimens.

In addition to his horticultural skills, Howard contributed his literary expertise when he consented to inaugurate a chapter newsletter, *The Connecticut Plantsman*, which became a model for future chapter newsletters.

A few years later, when the editor of the ARGS *Bulletin* had to resign, reluctantly and suddenly, Howard consented to edit our national publication. He began in mid-stream, starting with the Fall 1975 issue, and continued with distinction and style until family considerations forced him to retire at the end of 1977.

For thirty years, Howard has made innumerable and unheralded contributions to alpine gardening through his expertise in propagation, his generosity in sharing plants, and his willing contributions to both chapter and national publications. For his outstanding devotion to rock gardening and to the American Rock Garden Society, the Society itself is honored by awarding Howard N. Porter a long-due Award of Merit.

—H. Lincoln Foster

Marcel Le Piniec Award, 1988

James E. Cross

The Awards Committee of the American Rock Garden Society is pleased to present its annual Marcel Le Piniec Award to James E. Cross, proprietor of Environmentals Nursery, Cutchogue, New York. This award honors a nurseryman or propagator actively engaged in enriching and extending the range of plant material available to American rock gardeners. Mr. Cross, a propagator par excellence, concentrates on woody material of choicer and rarer sorts, especially plants of dwarf or "measured" stature, and maintains a continuing close relationship with the rock gardening community. His activities are a remarkably good fit for the Le Piniec Award requirements.

Jim Cross came to plants in mid-life. He was educated for business and finance at Ohio State and Stanford University and subsequently worked in the investment world of Wall Street. Plants became an important part of his life outside of the working day, and when Wall Street activities palled, he gave up his partnership and became a nurseryman. Environmentals was started in 1967 and

immediately became a source for quality material.

A thoroughly smitten plant enthusiast himself, Jim Cross seeks out and propagates new and desirable plant rarities, tests them in his own garden, and then distributes them commercially and privately to nursery outlets, to arboreta, and to many local and national plant societies. He has been a continuing source of desirable plant material, either sold or donated, for local ARGS chapter functions as well as national activities such as Study Weekends and Annual Meetings. As part of the contact process for these activities, many a choice plant has been freely given to chapter individuals, introducing it to the ARGS community informally before stock builds up for widespread distribution.

The propagating benches of Environmentals Nursery are an inspiration and a lesson to a touring ARGS chapter. Much of the material is of rock garden or rock garden background plants. Orderliness and cleanliness speak clearly from Jim's nursery benches to us amateurs with our unpredictable annual successes and disasters. His methods work, and he has shared them with the ARGS on a number of occasions in propagation lectures to single chapters and to Study Weekend assemblages. There are two rock gardens maintained at Environmentals, one at the nursery itself devoted primarily to dwarf conifers and a newer tufa garden for smaller

Jim Cross

specialized material adjacent to the house. These two gardens have become the focus of ARGS and other plant society garden tours in the Northeast.

In 1985 Jim and Connie Cross installed a display garden at the Long Island Chapter Study Weekend which will probably remain as the legendary standard for these affairs. The effect of such a garden on the interest and thirst for plant knowledge of ARGS members is beyond calculation. Other rock gardens have been constructed and presented to the ARGS and the general public by the Crosses at several Long Island Flower Shows and at the Hudson Valley Study Weekend in 1987.

Those who know Jim Cross can testify to his generosity and knowledge throughout the breadth of the plant world. He bears the mark of the true rock gardener—a specialist by virtue of wide but detailed knowledge which encompasses those plants of greatest rock garden interest rather than through a narrow based build-up of knowledge about rock garden plants only. He has always been ready to share and to teach, and there can be no doubt that he is an appropriate recipient for the Le Piniec Award. It is given with pleasure, with appreciation of the man himself, and with congratulations for his contributions to ARGS people and plants.

—Joann and Fred Knapp

Pleasures and Problems of a Scree

Morris West
Red Lion, Pennsylvania

With apologies to Louise Beebe Wilder for paraphrasing the title of her most popular book, I thought that any members contemplating the construction of a rock garden using a scree type mixture might be interested in my hands-on experience. The specific area of my rock garden composed of a scree mixture was constructed in the early spring and planting began immediately upon completion. It is approximately 25 feet by 40 feet on a slope facing north north west.

The soil mixture, which varies from 12 inches to 24 inches deep, consists of two parts limestone gravel, two parts coarse sand, and one part humus. The composition of the humus is something of a mystery. Its primary use is as a topping for turf grass lawns and golf courses. I believe it is a mixture of well-composted wood by-products and sewage sludge laced with sufficient dolomitic limestone to produce an alkaline pH. It was chosen because it was available from the local sand and gravel supplier who agreed to deliver the three components pre-mixed at no extra charge! The entire scree was topped with a thin layer of our local creek gravel, which is mainly eroded mica schist. The final pH is near 8.0.

The garden has an open exposure but is backed by a deciduous woodland on the south which limits direct sunlight except in high summer. A clump of birch on the west shades one area from the afternoon sun even then, thus creating a variety of habitats. Rocks, some of which are as large as 4 tons, provide total shade and cool root runs for species preferring those conditions.

The pleasures derived from nurturing rock plants in this environment have been many. It is no exaggeration to say that at least ninety percent of the plants introduced have been successful. This year, the fourth growing season since construction, bloom was present from February with *Crocus chrysanthus* 'E. A. Bowles' to November with *Crocus sativus*, *Gentiana scabra*, *Orostachys spinosa*, *Ipomopsis aggregata*, and some unknown phlox hybrids. The largest masses of blooms are provided by phlox species and hybrids (particularly some of Linc Foster's selections), *Arabis alpina*, *Aubrieta deltoidea* cultivars, and *Campanula portenschlagiana*.

Generally mats have proven more satisfactory than buns and hummocks. Three mats have succeeded beyond expectations. What

I acquired as *Brachycome multifida* is a tight 1-inch-thick carpet with dissected leaves and almost clear blue flowers, unlike the loose carpet or bushy plant with lilac or pink blooms listed in the *Seedlist Handbook*, the only reference in which I have found it. Three plants have made a yard-wide filigree of dull green leaves set with myriad blue flowers in late spring and never without a few blossoms into October.

Foliar effect also helps a rich green cascade of pinnately compound *Hippocrespis comosa* earn its keep, although the brief but attractive heads of bright yellow pea flowers offer added value in June. The stolons of *Isotoma fluviatilis* send out small, uniquely attractive leaves splayed across the brown gravel. The stems are set with small porcelain blue flowers from early summer to fall. I was unsure of the hardiness of each of these three taxa, but so far they have survived temperatures to +5° F. without snow cover. All seem to prefer maximum sun.

Penstemon caespitosus has flourished with occasional unexplained dieback of individual stems, but is absolutely miserly with its attractive scrophularious blossoms. Other members of the genus have been less niggardly with their floral displays. Particularly pleasing was my first flowering of *P. jamesii* and *P. neomexicanus*. *Penstemon teucrioides* has all the virtues of its caespitose sister plus a modest floral display. Even *P. pinifolius* here in the scree more nearly approaches its natural floriferousness than clumps elsewhere in the garden in a heavier neutral soil. All of these westerners are, of course, heliolatrous.

Most of the other best successes are also far from rare, reconfirming that the common rock plants are common for a reason. They earn their keep. I'm fond of simple flowers rather than doubles which means I often benefit from self-sown seedlings generally identical to the parents except for phlox, the most promiscuous tribe in the rock garden. The results of these matings have produced no 'Laura' or 'Coral Eyes' but no real dogs either. One promising reddish-purple cross puts on a respectable late summer-fall show. All the phlox in the rock garden will settle for considerably less than full sun, but most prefer it.

Erysimum alpinum also seeds prolifically. The old plants decline, but progeny quickly take their place plus providing extra seed and plants for the ARGS Seed Exchange and chapter plant sales. They require at least a few hours of direct sun. What they don't require is any mulch of organic material such as fallen leaves, which produce a fungal rot in short order. A similar problem affects *Asperula pontica*, which thrives in a more protected spot, but can't tolerate even one birch leaf in damp weather without an inch circle of dieback underneath within 3 days.

With roots in the shade of large rocks, *Clematis alpina* sprawls several feet over the rocks and displays not only flamboyant blue flowers in late spring but attractive whorled seed heads throughout the summer. In almost total shade under the north face of rocks, several campions have developed nice colonies. The virginal white 4-inch-tall *Silene alpestris* comes first, with *S. caroliniana* 'Millstream' and *S. caroliniana* ssp. *wherryi* close behind. The last two must be kept well separated, since the subtle cotton-candy pink charm of the latter could never compete with the eye catching brilliance of the former. In an even more sheltered chamber between large rocks, a group of *Ramonda myconi* and *R. myconi* 'Alba' are especially vigorous. Other rosettes in a dry wall with more direct sun are quite healthy, but look miserable in their shrunken state during our usual mid-summer drought while the ones in the shaded scree are a fat as cabbages.

The rock garden does not contain many shrubs. A dwarf hemlock, a couple of piceas, and *Yucca filamentosa* are the largest plants. On a smaller scale an attractive display has developed from three plants of *Leiophyllum buxifolium* var. *prostratum* in a specially created acid pocket.

The major problems really overlap the pleasures. The loose sandy gravel mix that allows plants so inclined to spread easily, means an inhabitant such as a favorite pink *Oenothera kunthiana* (a gift from our former ARGS secretary) requires constant vigilance and isolation to keep its romping ways in check. The fecundity of many desirable species also means interlopers such as *Oxalis corniculata, Potentilla canadensis, Euphorbia supina, Trifolium repens*, et al. establish with equal felicity. I suppose we all add to the problem by introducing things like *Cymbalaria muralis* and *Sedum kamtschaticum* and then spend years regretting it. The results are that a minimum of 2 hours a week must be devoted to concentrated weeding, leaf removal, and other clean-up chores, which can never be delayed without deleterious results. However, there are few places I'd rather be than in the rock garden, and weeding is a favorite occupation that allows ample opportunity for uninterrupted contemplation, so even these problems are really pleasures.

Daffodil Souffle

Ann Lovejoy
Bainbridge Island, Washington

The newest gardens are apt to look a bit skimpy despite, or perhaps because of, the novice gardener's attempts to space everything "by the book." Fortunately, there is a simple and effective way to dress up any spring garden, no matter what the scale. An infusion of bulbs will bring a wave of cheerful color, and the number of appropriate species for the rock garden will keep the would-be artist hovering between catalogs, garden diagrams, and plant lists for long, happy weeks. Many purveyors of big border plants also carry an increasingly sophisticated selection of minor bulbs. This year, be on the watch for such treasures as the dapper *Hermodactylis tuberosus*, once considered an iris and still looking just like one. Fragrant and mysterious, it has olive green standards and black velvet falls, and stands 6 or 8 inches tall. Somewhat flopsy of leaf, it is nonetheless an unmatchable garden treasure.

My favorites among the minor bulbs are the species narcissus, of which a surprising number are available from ordinary commercial sources. Look for a catalog note on the source, and please buy only those raised in the wide, wet fields of Holland and not plucked illicitly from endangered home turf; happily, getting legal stock gets more likely every year, thanks to responsible growers and nurserymen. Many species narcissus are too tiny for casual garden placement, best suited to a stellar position in trough or raised bed where their small beauties can be most readily appreciated. It is also possible to grow them indoors, and this may be the best way of all to become intimately acquainted with these little bulbs.

This has become our annual winter treat; each year in late winter, our sunny kitchen windowsill is glorified by large vases of evergreens and forced flowers which look all the fresher for the continuing frosts outside. Glossy leaved magnolias, just showing color; bright wands of weeping willow and forsythia; kerria and quince, now share shelf space with a row of tiny pots, only 2 or 3 inches across, each sprouting a number of tiny narcissus—yellow, white, and nearly green—all looking exactly like the big garden

daffodils, but none over 6 inches in height, most rather smaller and infinitely more fetching.

The first to open are the hoop-petticoats (*Narcissus bulbicodium* sp.) in late January. All the bulbicodiums carry cone-shaped flower with narrow, almost vestigial segments that look like petals surrounding the corona or crown. Earliest this year were not the usual white ones (*N. bulbicodium* var. *monophyllus* varieties) but *N. bulbicodium* var. *tenuifolius*, with thin, grassy foliage and sporty little inch-long trumpets stained green at the base. There are quite a few forms of these sunny little creatures in colors ranging from creamy white through moonlight to a decidedly warm yellow. All are among the first-blooming bulbs of the year, most hardy enough to survive anything that winter can challenge them with, given adequate drainage.

Although seldom over 5 inches in height, hoop-petticoat daffodils are tough enough to establish themselves in grass, seeding generously if the pods are left to ripen. People who cherish their lawns and vigilantly root out every daisy and dandelion will be horrified at such a suggestion, but in an informally shaped lawn, perhaps surrounding a spring-flowering tree, sweeps of hoop-petticoats look like the face of spring itself. Because they are so small, they are better suited in scale to little urban gardens than the hefty, even lumpish garden forms often seen, and look most naturally at home in the rock garden proper. In our Seattle garden, a dozen bulbs (planted by a 3-year-old) have multiplied almost three times without division or intervention in just a few years. This will only happen where the grass is left uncut until after the seeds disperse, which may mean mid-June or even later. Where that would be impractical, the bulbs can be planted into a loose, low groundcover of mats or creepers, or among subshrubs, where they will be nearly as pretty if less startling when they emerge in earliest spring.

For some, a compromise solution might be to leave a patch or two of longer grass, in which these and other bulbs can naturalize, with the rest of the lawn mown as usual. This can be especially effective if you seize the chance to use some interesting ornamental grasses in the bulb areas, which will then never need to be mown at all. Plant big clusters of checker lilies (*Fritillaria meleagris*) in lavender tweed amid emerging clumps of scarlet blood grass (*Imperata cylindrica rubra)*; set baby daffodils beside steel blue fescues; and set white species daffodils and snowdrops to rise behind the black new leaves of the turf lily, *Ophiopogon planiscapus* 'Nigrescens.'

The mountains of Spain are home to the delicate *Narcissus asturiensis* (*minimus*), smallest of all, which lifts minute golden trumpets to the spring sky, offering its slight scent to the year's first

bees who can scarcely fit their eager snouts into such tiny flowers. This form likes gritty soil with excellent drainage, and dislikes the company of any but the shallowest groundcovers. *Veronica pectinata* has small leaves, woolly and grey, in open, flat carpets which don't seem to distress the bulbs, and the winking blue-eyed flowers which cover this carpet in summer are a nice bonus.

Having wintered over on a cold but sunny glassed-in porch, the triandrus daffodils scurry into bloom in early February, well ahead of their normal out-of-doors schedule. As a group, *N. triandrus* seldom exceed 5 inches in height, and a happy bunch looks like a tiny flock of squid, so reflexed and narrow are the corona segments above the tubular trumpets. These are difficult to keep going in the garden unless planted in almost pure grit or coarse sand, and so small that they can easily be overlooked. It's pleasant to grow them in pots, bringing them inside to admire the bloom at close range. Perhaps more people would grow 'Angel's Tears,' the white form, if they knew that Angel was the native guide on Peter Barr's plant hunting expedition into the Asturian mountains of Spain. Early in this century, Barr dragged his weary guide ever further up the unfriendly slopes in search of this and other species. When they finally found the white triandrus Barr sought, the exhausted guide burst into tears—all that work and struggle, for such a measly small flower as that? If you prefer to think that he cried at the incredible purity of form, you are welcome to—and you might be right.

Last fall I planted several dozen bulbs together; the white triandrus (*N. triandrus* var. *albus*) along with some Iberian relatives in palest yellow (*N. triandrus* var. *concolor*), and the softly bicolored *N. triandrus pulchellus*. They look exceedingly charming foaming out of a white souffle dish lined first with gravel, then sphagnum moss, then a mixture of sand and compost. I use the dish as a centerpiece, much to my husband's disgust, for it means one of his favorite cooking dishes has been out of service for months and is likely to remain so for some time to come.

This is a dreadful habit, this planting of bulbs and plants into cooking utensils, and one I learned at my mother's knee. When nobody could find the baking sheets, they would turn up in the studio, daubed with paint, or in the greenhouse, covered with pots. Knives were invariably discovered on the potting bench, often rather worse for wear. When I was more of a cook than a gardener, that scandalized me, but I have come to view it as an important form of recycling. When the Teflon coating begins to peel off the baking sheets, they move to the sun porch to hold pots and keep the windowsill dry. Many things have many uses, and linear thinking is one of the most destructive problems of our harried age. How else could we ever taste the joys of daffodil souffle?

Hardy Heaths and Heathers

Pamela J. Harper
Seaford, Virginia
(Drawings by Laura Louise Foster)

To purists, only *Calluna vulgaris*, the ling of Scottish moors, is "heather," all species of the closely related *Erica*, being "heaths," but gardeners tend to use the terms interchangeably. Heathers, except the tree heaths, are low growing, spreading, evergreen plants, popular for groundcover in these days of low maintenance gardening. There are kinds which flower in every season, but northeastern gardens are devoid of bloom from late April to mid-June, a gap filled in gentler climates by *E. mediterranea*, the tree heaths, and in the South by the earlier bloom date of many varieties.

Heather flowers come in white, lavender, pinks and purples, all shades which blend well into the landscape. There are no true blues, no true reds (*Daboecia* 'Praegerae' comes close) and, among the hardy heaths, no yellows. Yellow is, however, amply provided by the foliage of many cultivars, along with gold, bronze and coppery red. Generally heathers look best grown in drifts of three or more, planted 18 inches apart, but some diminutive kinds show best as individuals in such settings as rock gardens. Heather lasts well cut; and *Calluna* is virtually everlasting, being almost as attractive dried as alive.

Calluna is a monotypic genus with only one species, but even in the wild, seedlings frequently occur that differ from the type. When a collection of heathers is assembled in a garden, this variability of seedlings becomes even more pronounced. *Calluna* also frequently "sports" (produces a branch differing from the main plant) and thus have come about the hundreds of cultivars now available. Little planned breeding has been done. For those prompted to try, it is worth knowing that the flowers of seedlings will invariably resemble the seed and not the pollen parent. *Calluna* is one of the easiest heathers to grow.

There are hundreds of species in the genus *Erica*, but most of these came from South Africa and are too tender for garden use in the U. S. A. Among such tender species are the pot-grown plants sold by florists, too often labeled "Scotch heather." Disliking equally the cold of our gardens and the dry warmth of our homes, most of these are destined for early death. Indeed, a large propor-

tion are already dead when purchased. These tender Cape heaths do make beautiful plants for greenhouses and conservatories and were once much in vogue in Europe for this purpose. They can also be grown outdoors in such frost-free places as the San Francisco Bay area. *Erica canaliculata* is one of the hardiest of the Cape heaths.

The rather few hardy *Erica* species subsequently mentioned are native to Europe. *Erica carnea* is the most widely grown of these, with many cultivars from which to choose. The degree to which a species self sows can be gauged from the number of available cultivars—hundreds in the case of *Calluna*, fewer of *Erica carnea*, only a handful of most other kinds.

The origin of the words "heath" and "heather" is lost in antiquity, though they clearly stem from a common origin. A moor or heath is a large tract of untilled ground of low fertility, the peaty soil often sheeted with heather. Although heaths and heathers

Erica carnea
'Springwood White'

Calluna vulgaris - Heather

have at times been placed within the same genus, there are botanical differences. *Calluna* leaves are scalelike and tightly imbricated. The divided calyx is the colorful part of the flower. *Erica* leaves are separate and needlelike, with the urn-shaped corolla the conspicuous part of the flower.

In 1963 the Heather Society was formed in London and this is now the international registration authority for this group of plants. [In 1977 the North American Heather Society was formed. You may write to Alice Knight, 62 Elma-Monte Road, Elma, WA 98541 for information about this society.]

Few English gardens (save those on alkaline soil) lack heathers. The heather garden of a European devotee will probably contain the following, with their multitudinous cultivars:

Calluna vulgaris, heather or ling
Erica carnea (*E. herbacea*) winter heath
E. ciliaris, Dorset heath, summer flowering
E. cinerea, bell heather
E. x *darleyensis*, hybrids between *E. carnea* and *E. mediterranea*
E. mackaiana, summer
E. maderensis (*E. cinerea maderensis*), Madeiran heath, summer
E. mediterranea (*E. erigena*, *E. hibernica*), Irish heath (a term also used for *Daboecia*)
E. x *praegeri* (*E. mackaiana* x *E. tetralix*), spring, summer
E. 'Stuartii' (resembles *E. tetralix*)
E. umbellata, Portuguese heath, spring and summer
E. vagans and the similar but less hardy *E. multiflora*, summer
E. x *watsonii* (*E. ciliaris* x *E. tetralix*), summer and early autumn
E. x *williamsii* (*E. vagans* x *E. tetralix*), summer, cultivar 'P. D. Williams' is the plant usually listed in U. S. as 'Williamsiana'
Bruckenthalia spiculifolia, Balkan heath, one of the hardiest and easiest
Daboecia cantabrica (*D. polifolia*) St. Daboec's heath
D. azorica, Azores heath, tender
D. x *scotica*, hybrids between the above two species

Most of the above remain under 2 feet in height. *Erica mediterranea* cultivars range from 2 to 4 feet. In addition, the following tree heaths are grown, usually 4 to 6 feet in height:

Erica scoparia, besom heath, greenish inconspicuous flowers, dwarf 'Compacta' makes a rounded hummock little more than 12 inches high
E. arborea, white flowers in spring, 'Alpina' is the hardiest
E. australis, usually pinkish-mauve but with deeper pink forms and white 'Mr. Roberts'
E. lusitanica, red buds, white flowers, spring

Bruckenthalia spicata

Daboecia cantabrica

Erica tetralix

E. terminalis (*E. stricta. E. corsica*), pink, summer and autumn, 3 to 4 feet

Most of these can also be found in gardens in the Pacific Northwest, where growing conditions are quite similar to those in England. Mrs. Dorothy Metheny (2810 46th Avenue West, Seattle, WA 98199) has one of the most comprehensive collections and welcomes interested visitors, by appointment. On the East Coast conditions are less favorable for some species, with the possible exception of Cape Cod. Up to the time of his death, Harold Copeland grew a fine collection at Chatham.

In 1966 he reported: "Long Island, Philadelphia and Cape Cod are in the same hardiness zone and alike cannot expect dependable snow cover in winter; yet there is a wide divergence in heather growing experience. According to personal testimony of heather enthusiasts in the Long Island and Philadelphia areas, there is a varying amount of splitting of stems, browning of foliage and plant loss depending upon winter severity, and this despite the fact that in these sections it is common practice to cover the entire heather garden for winter protection. We provide no winter cover for established plants yet they are totally unharmed. The only exception is a light cover of cranberry vines placed on rooted cuttings set out the previous May.

"In preparing our heather beds, we incorporate large quantities of native bog peat and mix two handfuls of peat in each planting hole. We never use manure or commercial fertilizer but topdress as required with compost, leafmold and seaweed. Where plants are small enough and have not grown into one another, each winter we place rotted pine needles around the base, this serving three purposes—the protection of plant roots, provision of food, and discouragement of weeds."

Mrs. Esther Deutsch of Long Island was also a heather enthusiast. Callunas 'Alys Sutcliffe' and 'Bronze Beauty' are believed to have been her introductions. At Windham, Pennsylvania, Walter Kolaga of Mayfair Nurseries grew for sale some 50 varieties of *Calluna, Daboecia, Erica carnea, E. cineria, E.* x *darleyensis, E. tetralix, E. vagans* and *E.* x *williamsii.* Among his introductions were callunas 'Mayfair,' 'Juno,' 'Martha Hermann' and 'Valorian,' and *Erica carnea* 'Mayfair White.' Callunas 'Dainty Bess,' 'California Midge,' 'Branchy Anne.' 'Else Frye' (a sport on 'H. E. Beale') and Dorothy Metheny's 'Autumn Glow' and late-flowering 'St. Nick' are some of the West Coast introductions.

Northern Trials: In recent years extensive testing has been done by eastern Long Island wholesale grower James E. Cross of Environmentals. The following describes sixty-five cultivars he is growing

commercially, coded as follows: (1) quite reliable, prime; (2) reliable but not so nice for one or more reasons; (3) moderately difficult; (4) difficult to maintain in good health; (5) difficult but so special as to justify several attempts. Flower time: W, winter; SP, spring; ES, early summer; MS, midsummer; LS, late summer; F, fall. Growth habit: spr, spreading; dm, dwarf mound; upr, upright; lm, low mound; pros, prostrate; hm, high mound. The last item is the foliage color in summer/winter.

Calluna: (1) 'Alba Rigida,' white, MS, 6", spr, bright green
(1) 'Alys Sutcliffe,' lavender, MS, 4", dm
(1) 'Aurea ,' purple, MS, 12", upr, gold/orange red
(2) 'Barnett Anley,' purple, MS, 18", upr
(1) 'Blazeaway,' mauve, MS, 18", upr, gold/orange red
(1) 'Bronze Beauty,' lilac, F-W, 18", upr
(2) 'Caerketton White,' white, ES, 12", upr, bright green/bright green
(2) 'Coccinea ,' crimson, MS, 9", spr
(1) 'County Wicklow,' silver pink double, MS, 9", spr
(1) 'Cuprea',' mauve, MS, 15", upr, copper/rust
(2) 'C. W. Nix,' crimson, MS, 24", upr
(2) 'Crispa,' white, MS, 12", upr, bright green/bright green
(2) 'Cramond,' silver pink double, MS, 18", upr
(3) 'Foxii Nana,' lavender, MS, 4", dm
(2) 'Gold Haze,' white, MS, 15", spr, gold/gold
(2) 'Hibernica,' mauve, LS, 9"
(5) 'Humpty Dumpty,' white, MS, 6", dm, bright green/bright green
(1) 'J. L. Hamilton,' double pink, MS, 9", spr
(1) 'Kuphaldtii,' purple, MS, 4", dm
(1) 'Mair's Var.,' white, MS, 24", upr, bright green/bright green
(5) 'Mrs. Pat,' mauve, MS, 9", upr, pink and white tip growth
(1) 'Mrs. Ronald Gray,' red-purple, MS, 2", dm
(2) 'Peter Sparkes,' double silver pink, MS, 18", upr
(2) 'Red Haze,' lavender, MS, 12", spr, gold/red fleck
(2) 'Robert Chapman,' purple, MS 15", spr, gold/orange red
(2) 'Serlei,' white LS, 24", upr, bright green/bright green
(1) 'Silver Knight,' (tentative), lavender, MS, 18", upr, silver/silver
(2) 'Silver Queen,' lavender, MS, 15", spr, silver/silver
(2) 'Silver Spire,' white, MS, 18", upr
(2) 'Silver Rose,' lavender, MS, 18", upr, woolly
(3) 'Sister Anne,' pink, MS, 4", dm
(2) 'Sir John Charrington,' mauve, MS, 14", upr, gold/orange red
(1) 'Tenuis,' crimson, ES-LS, 9", spr
(1) 'Tib,' double purple, ES-LS, 12", upr
(3) 'Torulosa,' white, LS, 15", upr

Erica carnea: (3) 'Anne Sparkes,' red, W-SP, 6", lm, gold/bronze

(1) 'Foxhollow Fairy,' pink, W-SP, 6", pros
(1) 'King George,' rose-pink, W, 9", lm
(1) 'Myretoun Ruby,' rose-red, W-SP, 9", lm
(1) 'Pink Spangles,' pink, W-SP, 9", lm
(1) 'Porter's Red,' red, W-SP, 9", lm
(1) 'Praecox Rubra,' rose-red, W, 6", pros
(1) 'Springwood Pink,' pink, W-SP, 6", pros
(1) 'Springwood White,' white, W-SP, 4", pros, light green/light green
(2) 'Vivellii,' carmine, SP, 9", lm, black
(1) 'Winter Beauty,' light pink, W, 9", lm

Erica cinerea (questionable hardiness): (4) 'C. D. Eason,' red, ES, 12", spr
(5) 'Golden Drop,' mauve, ES, 9", spr, gold/red (It will be noted that *E. cinerea* is coded as difficult to grow well—this is generally true everywhere.)

Erica hybrids (none quite hardy enough to rate higher):
(3) E. x darleyensis 'Darley Dale,' light pink, W, 18", hm
(3) E. x darleyensis 'George Rendall,' pink, W-SP, 18", hm, gold tips
(4) E. x watsonii 'Dawn,' rose-pink, MS, 9", lm, gold tips
(4) E. x williamsii 'P. D. Williams,' pink, MS, 9", lm, gold tips

Erica tetralix: (3) 'Alba Mollis,' white, MS, 9", lm, silver gray
(2) 'Con Underwood,' crimson, MS, 9", lm
(2) 'Darleyensis,' salmon-pink, MS, 6" spr
(4) 'Pink Star,' pink, MS, 6", spr
(*E. tetralix* is down-rated not for want of hardiness but because of an undiagnosed tendency—possibly a branch-attacking phytopthora fungus—for sections of a plant to die out.)

Erica vagans (suffers from stem splitting at below 5° F.):
(4) 'Lyonesse,' white, MS, 15", lm
(4) 'Mrs. D. F. Maxwell,' cerise, MS, 15", lm
(4) 'Nana,' white, LS, 6", lm
(4) 'St. Keverns,' pink, MS, 15", lm

Daboecia cantabrica: (3) 'Alba,' white, MS-LS, 18" upr
(3) D. cantabrica, lavender, MS-LS, 18", upr
(4) 'Porter's Var.,' crimson, LS, 12", lm
(4) 'Praegerae,' pink, LS, 15", spr

Erica arborea: (4) 'Alpina,' white, ES, 3' to 6', upr

No such thorough testing has been done in the South. My own experience indicates that those varieties most tolerant of cold are also the best able to survive summer heat. Callunas 'Mrs. Ronald Gray' and 'Cuprea' are outstandingly tough and accommodating plants. South of Maryland, *E. ciliaris*, *E. mediterranea*, *E. vagans*, *E. stricta*, the summer hybrids and *Daboecia* are usually hardy and the *E.* x *darleyensis* group are among the most reliable of all

heathers. Losses from *Phytopthora cinnamomi* and other root-destroying fungi become more likely as summer temperatures rise. For the amateur it is best to tackle the fungus problem culturally by (1) buying from reliable nurseries to ensure that healthy plants are obtained; (2) providing good drainage (raised beds and banks do this, also incorporating coarse sand or stone ships on heavier soils); (3) growing in partial shade to keep soil temperature down.

Habitats for Heathers: Except for the winter heaths and *Erica terminalis*, which are somewhat lime-tolerant, heathers need an acid soil. Mr. Cross has also found that phytopthora is less of a problem where pH is 5 or under. The soil should be crumbly to at least 1 foot in depth, well drained but never completely dry. The addition of moist peat (dry peat does more harm that good) is beneficial on most soils, as is a mulch of compost, pine needles, shredded bark, stone ships or other moisture-retaining material.

In their native habitat heathers often grow in a shallow layer of peaty soil or rotted vegetation overlying an impervious subsoil. On the misty moors, they can take in needed moisture through their foliage, but this they cannot do in the summer heat and desiccating winter wind and frost of many North American gardens, so they should be encouraged to root deep. It cannot be emphasized too strongly that newly planted heathers must never dry out (nor must they be subjected to bog conditions—if they do, the plants will die.)

Like all evergreens, heathers are never completely dormant. The best planting time is that which gives the maximum period of good growing weather before excesses of heat or cold set in. This generally means early spring in the North, October or February/March in the South. Container-grown heathers can be planted during spring and summer provided it is remembered that they are at high risk from drought until the roots become well established, which will take a year.

Heathers will grow in full sun or part shade. A site offering protection from winter sun and wind will help prevent foliage scorch, as will a cover of evergreen boughs or salt hay. Bays between shrubs also offer protection. Snow provides the perfect protective blanket, which explains why *E. vagans*, prone to stem splitting on Long Island, grows successfully in Vermont.

Apart from attention to watering the most important cultural practice is an annual clipping, in early spring. Remove any winter-damaged wood and most of the previous year's growth. This treatment keeps heathers young and healthy for many years; without it they get leggy and overgrown, more prone to winter damage, and

need replacement after about five years. Then add fresh mulch around the plants until such time as they meet up.

Most heathers layer readily, often without the gardener's help, although pegging down branches with a hairpin into a handful of moist peat and sand makes results more sure. Cuttings strike nearly 100%—I use plastic propagator boxes from England (available from importer Walter F. Nicke, Box 667G, Hudson, New York 12534). The trays lack drainage holes, which must be drilled. Fill the trays with a 1:1 mix of moist peat and coarse sand or vermiculite. Use 1 to 2 inch cuttings, heel or tip, of the current season's growth, not so soft that it wilts nor so hard that it cannot be pinched off easily.

Enhancing heathers: Here are just a few of the plants which I have enjoyed in combination with heathers. Clear reds and blues rarely blend well with heathers. Most of the yellow-flowered brooms (*Genista, Spartium, Cytisus*) are good. So is the spiny little *Erinacea anthyllis* (*pungens*) or "blue broom," the flowers a subdued greyed hue. *Potentilla fruticosa* flowers over a long period with various cultivars available in white, yellow, apricot, orange, and the new 'Red Ace.' Purple and gold is always a telling combination, so the smoketree, *Cotinus coggygria*, in one of its purple-leaved forms, makes a fine backdrop for such heathers as *Erica carnea* 'Aurea,' *E. cinerea* 'Golden Drop' or *Calluna* 'Gold Haze.' On a smaller scale the same tint is provided by *Berberis thunbergii* 'Atropurpurea' and dwarf 'Nana.' Reverse this combination by using purple-flowered heathers around such golden conifers as *Chamaecyparis obtusa* 'Crispii' (about 15 feet in as many years) or the ever-popular goldthread, *C. pisifera* 'Filifera Aurea.'

In English gardens heathers are frequently used to weld into cohesiveness what might otherwise be a horticulturally interesting but esthetically spotty collection of dwarf conifers, among which *Chamaecyparis obtusa* 'Nana' and the coppery *Thuja occidentalis* 'Rheingold' rank high. The bog rosemary, *Andromeda polifolia*, is often included in heather gardens, but give it partial shade where summers are hot. *Spiraea japonica* 'Bullata' is a slow-growing compact shrub with attractively quilted or blistered (bullate) leaves and heads of crimson flowers. I am fond of *Chamaedaphne calyculata* in its low-growing form, about 15 inches high, with small evergreen leaves turning brown in winter and wiry twisting branches along which are borne small white bells early in the year. This is very hardy (-40° F.) but another favorite, *Cistus*, is only hardy to 10° F.

Recommended for beginners: If you have not grown heathers be-

fore, begin with those varieties which are consistently best sellers. *Erica carnea* 'Springwood White' heads the popularity poll, the most prostrate and spreading of all the winter heaths. The new *E. carnea* 'Pink Spangles' has supplanted the older 'Springwood Pink'—still a good plant. Double-flowered tall-growing *Calluna* 'H. E. Beale' is tops for cutting and drying, and bright pink *E. vagans* 'Mrs. D. F. Maxwell' still heads its class. *Daboecia* has the largest bells (and leaves) of any heather, with the pure white 'Alba' and the almost red 'Praegerae' firm favorites wherever they are hardy. Among the foliage callunas 'Robert Chapman' is about the most spectacular, but the old 'Blazeaway' is the most reliable. The small dense bells of *C.* 'Foxii Nana' makes it ever popular for rock gardens.

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Hedyotis Caerulea

Lawrence R. Franz
Bel Air, Maryland

By any other name a bluet is a bluet—or is it?

Since I was a small boy of 12 years in Baltimore, I have considered two flowers to be my favorites of all the many choices. It has always been difficult for me to choose between the pink lady slipper orchid, *Cypripedium acaule*, and the bluet, *Hedyotis* (*Houstonia*) *caerulea*, as to which would finally be number one. I still cannot really decide. Two totally different plants needing just the opposite growing conditions; maybe that is part of the fascination, and maybe that is why I have always had a woodland garden and a sunny rock garden.

At this tender age, 60 years ago, I would walk a mile and a half to the Pole Line Woods, as it was called, to collect leaf mold in a 100 pound burlap sack and carry it home on my shoulders to be used in converting the old chicken run to the woods garden. The Pole Line Woods is where I had first discovered the pink lady slipper. I could keep it growing only through the second year and then I would have to replace it. I have had better luck with it more recently. My latest plantings have continued for 10 years.

It seems as though *H. caerulea* has always been in the garden

and I cannot remember my first contact with this beautiful miniature plant. I remember seeing it in the open fields in such a vast amount that it looked like the reflection of the blue sky on the earth. Once it is planted in a sunny rock garden, it will self sow just about anywhere, and in the most unexpected places. In the spring it will make a mat of foliage 1 to 3 or 4 inches in diameter and about 1 inch high.

The flower stems will rise to about 5 inches and form a solid mass of blue four-petaled flowers. It is a must for everyone's garden.

Hedyotis caerulea will grow in partial shade but prefers full sun. It also prefers a slightly acid soil of equal parts coarse bank sand, peat, compost, and top soil and loves a lifetime of even moisture. It will then bloom in spring and fall and sometimes in between.

In addition to bluet, *H. caerulea* locally has been called Quaker-ladies, angel-eyes, innocence, and forget-me-not. Maybe that is why I will never forget this gem of the garden.

Each plant will produce very short runners to form new plants and the original plant will disappear. If allowed to go to seed, it will continue in the garden, year after year. Collecting seed is almost a daily chore. The plant should be inspected daily after noticing the first ripe seed. The simple way is to lay a sheet of white paper beside the plant, bend the flower stems over it, and gently tap the flower heads. Each flower head will contain up to four black seeds, which ripen over a long period of time.

One evening in the spring of 1984, I walked out to the garden and stopped to enjoy the bluets. I noticed that one flower head had five petals instead of the usual four. It was also larger than the other flowers blooming on the cluster. Everything else was the same. On closer inspection, by following the stem to the foliage, I found this individual stem to be branched with other flowers but all had the usual four-petaled flowers. I placed a piece of scotch tape on the stem so I could collect the seeds when ripe. To my utter disappointment, it made no seed.

In the spring of 1985, I transplanted some bluets to another spot in the rock garden. That year I had two plants that threw an occasional five-petaled flower, one on a transplant and one at the original site. Each time a five-petaled flower opened, there was only one flower to the stem. The rest of the flowers had the usual four petals.

Spring 1986 was a hectic time. We sold our home and moved into a condominium. Some of the rock garden plants along with some concrete blocks that housed my compost pile were taken to my son's home. It was not long before I had a 5- by 8-foot cold frame to be covered with three old storm window sashes when late fall arrived.

I dug up and potted many of my treasures including the two plants of *H. caerulea* that had produced the five-petaled flowers. These plants were hilled in the cold frame and the pots were leveled off with coarse bank sand. To give air circulation under the glass, I removed a concrete block from under the glass frame on both sides.

Winter passed. All eight plants of *Lewisia howellii* survived in spite of being eaten to the crowns by Peter Rabbit who had found for himself a good protected area from the weather as well as a delicious smorgasbord for his daily lunch. But the bluets dried up and died. As spring progressed, I noticed some small seedlings forming in the pots. The plants had self sown. During the spring blooming period not one showed a five-petaled flower. I was disappointed and promptly forgot about them.

During the early summer, I decided to turn the area into a raised garden. Here the bluets formed nice small clusters about the size of 50-cent coins. One cluster finally had a bloom and it was a five-petaled flower. The camera was quickly focused on it. This was the only flower that showed—one single five-petaled flower. The plants look good and I am hoping, come spring, to see much more of them

Post-script: As of this late November date of 1987, the *H. caerulea* plant that bloomed in the spring has developed another five-petaled flower. The stem rises from the center of this tiny plant and has no side shoots and no four-petaled flowers. If it proves stable, I would like to name the five-petaled cultivar 'Ben Franz' in honor of my father John Benedict Franz (1888-1962), who encouraged me in my youth to work along with him in his many horticultural endeavors. He started with growing dahlias, was a charter member of the Maryland Dahlia Society of Baltimore, grew chrysanthemums, gladiolas, delphiniums, and peonies to list a few. And then he fell in love with rock gardening. Starting about 1930, he would send to England for seeds. On weekends, he and I would walk for miles visiting neighbors near and far to share the glories of their rock gardens and check on their new alpines. I was his shadow and loved every moment of it.

Post Mortem: Along came spring 1988 and with it the biggest disappointment of my "bluet" experience. When checking the seasonable advancement of the garden, I discovered that the glorious and frustrating plant of *H. caerulea*, which I cherished and anticipated seeing, had turned brown and lifeless. The worry of the sad awakening was that the only plant of all the bluets in the garden that did not survive the winter was the plant that threw the five-petaled flower.

While reading over my records of this flower's survival, I realized that each year since its discovery in 1984 this plant has never survived, come spring. It has always been a new seedling or sport.

This gives me hope for more to come. If so, I will take extra precautions throughout the winter to make it a permanent plant. Its heritage says it is a perennial plant and should withstand the freezing and thawing of our cruel winters. Also, its heritage says that my present crop of *H. caerulea* should again produce a five-petaled flower. If is does, I will certainly let you know.

A Passion for Raoulias

Phyllis Gustafson
Central Point, Oregon

To be on the cutting edge of the latest fad in rock gardening means you must let others know about your passion. I realized recently that growable raoulias are not seen in very many gardens. How could anyone not want to grow these wonderful carpets of green, gray, and silver?

Here are a few notes about raoulias grown by this enthusiastic gardener. These are not those impossible "vegetable sheep" I saw only once, in their last throes of dying under the bench in the alpine house of a wizard nurseryman. The New Zealanders call these plants of the grasslands, lake edges, open ground, and mountain creeks, "scabweeds." In all of these sites they are flooded regularly in the growing season by the storms that constantly deluge the mountains.

The small white rosettes of *Raoulia hookeri* make this the grayest of the ones I grow. It forms a slightly loose mat which really should be covered with a pane of glass in the winter. The colder the climate, the more important it is to protect this one from moisture while it is dormant. But the wonderful silver color is more than worth the extra effort.

I've grown the old favorite *R. australis* since 1976 and for many years I faithfully put a pane of glass over it each winter. A few years ago only a small portion of it would fit under the largest pane I had and I found out that it would thrive even in our wet winters. It is a lovely mat of gray to grow under *Helichrysum selago* or with any of the tiny spring bulbs of blue or lavender which come through it. Each rosette is about half the size of those of *R. hookeri*; wee or tiny are good descriptions.

Raoulia hectori x *Leucogenes grandiceps* is an intergeneric hybrid with more vigor than either parent. It has the soft, intriguing

foliage of the "Edelweiss" but grows like the raoulia. I also find it likes to be treated less harshly. Like all raoulias it loves light, but some morning light seems to be enough. It certainly needs shade in the midday in our hot valley. Again a glass over it in the rainy period is appropriate, but I've grown it for 2 years without it!

Raoulia monroei is a newcomer with a somewhat different look. Each leaf is deeply incised, stand straight up to its full 1/4 inch, and is slightly twisted. This gives the whole cushion the green and silver look of woven metallic threads since the front and back of the leaves are seen at the same time. It seems to be a fast grower and loves ample water all summer. It also stands up to winter, but like all raoulias, it will smother if any other plant grows against it. I lost half the plant when an *Oenothera kunthiana* came up at the edge of the plant and flopped all over it.

Raoulia x 'Greenstone' is a hybrid of *R. lutescens* and *R. subsericea*. It is crawling all over the nearby rocks. In 3 years it has become a mat 3 feet by 1 1/2 feet. Visitors usually comment on this plant because of the intense green color in summer and the lovely russet in the winter. It has long lacy new growth hugging the ground in every direction.

Raoulia glabra is an easy little green mat with the largest flowers of this group. Could it be *R. subsericea*? There seems to be some confusion between these two since I've had the same plant under both names. After asking around and finding confusion among my more knowledgeable friends (guess where I got the plants to begin with) I even consulted a couple of books. From this exercise I ended right where I started, learning only that *R. subsericea* has the larger flower of the two. They are nice white strawflowers similar to those of helichrysum. The plant stays pale olive green all year long.

Now we come to my one claim-to-fame plant. (I hope everyone has one!) I received a plant of *R. lutescens* from Lawrence Crocker in 1971 and put it on the tiny rock garden I was building at the edge of the front walk. The garden was built from sod turned upside down and some granite rock gleaned from a field being cleared nearby. Lawrence said to give the plant a slope with plenty of drainage in full sun. I gave it a north and west exposure and watered it with the lawn below. I often give it an extra spray early in the morning during the growing season. In 1976 I moved some of the large rocks so it could have more room to spread. After all, by then Lawrence was bringing people by to see this largest *R. lutescens* east of the coast range in southern Oregon. It gets a good top dressing of decomposed granite every year or two.

Unwittingly I had provided the essentials for growing these dwellers of the grasslands of New Zealand: the food, association, and water retention of the sod, the drainage of the slight slope, grit

for the new growth to crawl in, and plenty of water in the growing season.

Today the plant is about 2 1/2 feet square, even though I've removed a 9-by-12 cake pan full of pieces on a couple of occasions. It is always a source of conversation with its ever changing colors. What a chuckle I get when some soul comes along in midwinter and mourns over the loss of the very large dark gray corpse which isn't. In February the fun begins as I watch the colors start changing until by May it is a wonderful lime green. Then in June the whole carpet turns bright yellow with the tiny blooms which hold for almost a month until the seed starts fluffing off.

R. tenuicaulis is very easy to grow in any moist condition. I saw it take over a large section of a cool greenhouse here, and the large mat in one Seattle garden needs regular clipping to keep it in bounds. It is also green and gray, turning somewhat darker in the winter and has very wiry stems. It is more open growing than any of the others.

Raoulias seem to grow in a wide range of climates across the United States. I have seen them growing in gardens in Massachusetts, Denver, Portland (Oregon), and San Francisco. Here we have temperatures into the low teens without snow cover and highs above 110° F. with low humidity. I'm sure there are many success stories across the country. So if you haven't had success, just keep trying in different micro-climates in your garden until you have a nice collection.

Book Review

The American Weekend Garden by Patricia Thorpe, New York, Random House, 1988, hardbound, 286 pages, $24.95.

Although Pat Thorpe is a member of the American Rock Garden Society, this book has not been written for rock gardeners. It is for the beginning gardener, possibly someone who has just bought a new property and can garden only on weekends. However, there are so many off-beat attitudes expressed and so much good advice that every gardener would enjoy its enthusiasm and wisdom, especially as it recognizes the profound differences in climatic and soil conditions that different regions of the United States enjoy.

The advice/opinions expressed include anti-foundation pro-clump plantings, plan drawing, and group planting rather than single plants. Ms. Thorpe also discourages "difficult" plants and doesn't like lawns. She is optimistic about bulbs and ambivalent

about animals. She is in favor of informal self sowing and conveys a take-it-or-leave-it attitude towards propagation otherwise. While garden design is very important, she admits overplanting is inevitable.

There is a list of recommended plants arranged to show the multi-regional nature of the book, and many familiar plants are introduced into the argument. A large section of handsome photographs in color illustrate the sort of plantings to aim for, and line drawings emphasize garden problems and solutions. Buy this book for a friend just beginning to garden, and trust that even if the scraps of rock garden advice don't convert the friend into a rabid rock gardener, at least they will have a reassuring guide to good design and a relaxed attitude to gardening.

—Geoffrey Charlesworth

Omnium-Gatherum

Interest Survey Results—Responses came from more than 330 members, about 9% of the ARGS membership. Below is a summary of the responses.

Subject	Percentages		
	High	Some	None
1. Plants	89%	10+%	0.4%
a. Single genus	76-	24	0.4
b. Best of genus	72	25	3
c. Single species	62	37	1
2. Plant explorers	29	54	17
3. Plant habitats	72	26	2
a. Wild	73	24	3
b. Garden	66	30	4
4. Nomenclature (name changes)	32	53	15
5. Plant culture	91	9	0
a. Propagation	83	16	1
b. Growing conditions	81	17	2
c. Soils	71	28	1
d. Climate	67	31	2
e. Hardiness	76	23	1
f. Feeding	59	36	5
6. Companion plants	45	45	10
7. Garden features	51	43	6
a. Troughs	51	39	10
b. Alpine houses	39	42	19

	c. Raised beds	57	39	4
	d. Water	36	48	16
	e. Walls	48	44	8
8.	Garden design	44	40	16
9.	Garden construction	39	45	16
10.	Garden descriptions	48	44	8
	a. Public	44	50	6
	b. Private	55	41	4
11.	Trips to see plants in wild	46	43	11
	a. North America	56	38	6
	b. Outside North America	38	51	11
	c. Where & how plants grow in wild	69	26	5
	d. Travelogs (low emphasis on plants)	18	33	49
12.	Humor and wit	27	43	30
13.	Philosophy, art, why of gardening	22	43	35
Bulletin features				
B1.	Selected reprints	32	56	12
	a. Chapter newsletters	30	53	17
	b. Earlier bulletins	31	52	17
B2.	Help wanted/trouble shooter	53	39	8
B3.	Computer applications	17	33	50
B4.	Issue featuring single theme	25	46	29
B5.	New professional research	55	40	5
B6.	Wanted column	53	38	9
B7.	Beginners	36	48	16

Many took time to write additional suggestions which are summarized here. It is hoped these results will give an idea and appreciation of the range of members' interests and suggest numerous ideas for future articles.

There is particular interest in sources for plants or for seed of plants mentioned in articles; in descriptions of plants and habitats; in articles on successes with plants difficult for most of us; in more information on screes, bogs, and woodland or shade gardens, and in best varieties and cultivars, dwarf evergreens, plants grown in containers, relationship of plants in wild habitats to their cultivation whether successful or not, pest control, humor of the Glattstein, Charlesworth varieties, and, of course, in our long sought goal of having more illustrations, especially in color.

A number of members want to know about plant name changes, suggesting a list of changes for the past few years and a brief update of changes in each issue as well as how to cope with the problems of changes changing back after finally being learned, of nurserymen who ignore changes, and what to do about changes and permanent markers.

Many desire to know more about seeds: collecting, recognizing, cleaning, dormancy, germination requirements and studies, what to do after seeds germinate, and special needs of specific seeds. Seed exchange results in terms of successes and failures and ease or difficulty of germination is wanted.

There is considerable interest in book reviews including ARGS Bookstore books, nursery catalogs, and reviews or excerpts from old and rare books.

A number would like a series on good alpine nurseries including first-hand accounts of *Bulletin* nursery advertisers. The ads received their share of attention, some noting that they read every ad. Special interest is expressed in the ads that change from time to time and those listing plants offered for sale.

There were requests for more information about or from gardeners: articles about outstanding gardeners whether award winners or not, about gardeners' practical day-to-day gardening experiences, successes and failures, and gardeners' informal descriptions of plants as they bloom in their gardens or as they find them in the wild.

Lists are desired for specific purposes including alkaline loving plants, acid loving plants, specialized nurseries in North America, public and private gardens and wild plant areas to see.

However, lists of plant names are not at all a popular means of describing what is seen in the garden or in the wild especially if the plants are at all unusual. The following is some of the information suggested to accompany plant names in articles: detailed description with line drawing, hardiness zone, difficulty, acid or alkaline requirements, soils, common and Latin name, sun and shade tolerance, heat and humidity tolerance, growth habit (invasive, self-sowing), and other growing conditions, likes, and dislikes. All of this is obviously impractical to include for each plant, but it does point up the hunger for specific information and the need to fill out the barren bones of lists. It also points up the need for readers to develop and use other sources of information. There is no substitute for research, experience, and listening.

"Depends" was a frequent response to the use of reprints; a single-theme issue; humor; and art, philosophy, and the "why" of gardening. Approval depends largely on personal interest in the topic for the former two and how masterfully the article is written for the latter two. Fear was expressed by a number that if the single theme lacked interest, the whole issue would be a loss.

The matter of interest runs the gamut from those who love it all to those who see value in very little and seem to disapprove the inclusion of anything outside their own narrow areas of interest. No two surveys are alike in response. Three of them stated precisely

what the scope of the *Bulletin* should be; they are all different. The survey responses fall roughly into two categories: a large group with a diverse and wide range of interests and a smaller group with responses showing interest focused on plants and their culture coupled with negative responses to companion plants, garden design and construction, humor, art and philosophy of gardening.

Several express interest in the *Bulletin* being more like the Scottish Rock Garden Club or the Alpine Garden Society publications and in having a series like "Plant Portraits" in the AGS *Bulletin.*

It is clear that there is intense interest in more articles about plants. These genera are suggested as being of interest: *Eriogonum, Lespedeza, Sabatia, Trillium* (worldwide), *Arisaema, Phlox* (western, New Mexican), *Primula* (growing well in Zone 7), North American succulents, especially *Lewisia.* More generally, interest is expressed in terrestrial orchids; ferns; rare bulbs; evergreen rock garden plants; dwarf low and slow growing woody ornamentals suitable for the rock, alpine, and peat garden; plants that are variously exceptionally beautiful, choice, rare, difficult, new, neglected, little known, easy to germinate and grow, not in *Hortus III* or the *Seedlist Handbook,* unusual and relatively easy, native non-montane plants of woodland and meadow, good alpine flora of North America; plant communities in a specific pH environment; borderline plants with respect to hardiness and tolerance to wet, dry, acid, lime; and best plants from each hardiness zone.

Interest is shown in plants of the Northeast, Mid-West, Ozarks, Southern Tennessee, Japan; plants for Zones 3, 4 and 7; and plants for Mediterranean climates and those with mild frost-free winters. Several expressed interest in plant families, plant identification, comparative evaluations of specific plants by two or more successful growers, genetics, ecological niches, toxic plants, and plant sociology.

Articles on American botanists and rock gardeners, lesser-known botanists for whom rock garden plants have been named, and contemporary expeditions head the list of suggestions for plant explorers.

Additional topics for articles on plant culture include pot culture, tissue culture and its success compared to growth from cuttings, organic and natural culture, soil-less mixes for propagation and garden, growing plants in rock and tufa, composting, information on the importance and effects of exposure, dealing with cultural requirements and conditions (sun and shade, wet and dry, open or sheltered, north or south-facing, sand or clay), what to do with wet or dry shade and wet sun, and the real secrets of the successful culture of difficult plants (needs lots of company, no over-

head water, etc.).

One immense problem for which help is requested is how to grow plants not suited to one's climate. Another problem is pest control, needing new ideas and solutions for dealing with fungus, bugs, disease, deer, and chemicals. Tips on maintenance, watering techniques, protection for the marginally hardy, and how to handle the label dilemma are requested.

A number want articles about gardening features as applied to small gardens on tract lots and in urban settings. In addition to features mentioned elsewhere, there is interest in container display, sculpture, garden accents, seats, arches, waterfalls, sun-heated pits, tubs, hanging gardens, window boxes, and use of space under overhanging eaves.

Considerable interest is shown in equipment and propagation structures, cold frame construction and uses, other devices for guarding against cold and wet, bulb frames, cool greenhouses, non-professional equipment for advanced gardeners, and innovative developments such as sand beds (a la Deno) and Grand Ridge beds.

Garden design and construction suggestions include a need for reference books; planting plans that work; photos showing before and after; articles emphasizing form and color; articles speaking to the non-specialist, non-technically trained gardener who responds with heart and aesthetics; information on soil mixes, drainage, how to make the design fit the site, and on how plants can be used to best effect (drift of seven plants, used singly, set in a specific groundcover).

In the area of garden description, there is interest in photos of well-known gardens and gardeners, articles describing personal walks around gardens with the gardeners, in learning how the gardens were designed and built, and in the history of well-known private gardens. It is requested that articles include brief descriptions of weather (temperature range, rainfall, seasons, hardiness zone), soil type, and map with compass bearings.

Diversity continues, in the category of trips, with interest in articles about places the reader *can't* go as well as only about places the reader *can* go and in the request not to get caught up in specific names and plant detail because habitats of plants and travelog information are far more interesting. There is, however, unanimity in responses citing the recent article on the Big Horns as an example of a good trip article.

There is interest in a column giving a brief summary of new sightings and range extensions. Many requests appear for travel helps including information on specific trips and what to look for, trips and maps of rock garden interest worldwide, plant exploration trips on a budget, where to find plants in the wild, best times

to visit, accessibility, and if-you're-planning-a-trip information (hotels, currency needs). A travel accommodation exchange is suggested so that ARGS members could stay with other members, keeping accommodation costs low, getting first-hand information on plants and gardens to see and where to go in the area, and enriching ARGS friendships.

Reactions to reprints range from "of great interest," "good stuff, hope you use it" to "absolutely not" and "No! No! No!" Reprints from specialist societies such as those for iris, heather, hardy plants, and perennials are suggested. Subjects for *Bulletin* reprints include articles about some of the early greats and by great American plantsmen such as Dwight Ripley, preferably from issues more than 10 years old.

Ideas for beginners include occasional truly introductory articles with basic information, sources for information, and having one or two beginners' questions answered in each "Help Wanted" column. The need for friendly encouragement, for getting beginners more involved, and for ways the knowledgeable can better include the beginners are expressed. It is noted that beginners learn fast and should never be discouraged, but inspired. Subjects for articles requested by beginners include *Primula* species, gentians, lewisias, saxifragas, soil mixes for seedlings, acid and lime-loving plants, watering needs and strategies, and an overview of basic cultural requirements.

Final ideas are for articles urging attention to conservation issues, giving techniques and equipment needed to photograph plants, introducing unfamiliar subjects, challenging us to consider well-known subjects in new ways, and broadening our horizons with subjects we may not at first welcome.

Notice—This is my final issue. I am released as editor of the *Bulletin*. Thank you for your contributions and kindnesses. Ted Marston of Kirkland, Washington, will be the new editor. Please give him your enthusiastic support.

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