Penstemon davidsonii

Bulletin of the American Rock Garden Society

VOL. 40 WINTER 1982 NO. 1

THE BULLETIN

CONTENTS VOL. 40 NO. 1 WINTER 1982

Cover Picture — *Penstemon davidsonii* — Sukii Saito McDonough, Norwood, Massachusetts

---

Published quarterly by the AMERICAN ROCK GARDEN SOCIETY, incorporated under the laws of the State of New Jersey. You are invited to join. Annual dues *(Bulletin included)* are: Ordinary Membership, $9.00; Family Membership (two per family), $10.00; Overseas Membership, $8.00 each to be submitted in U.S. funds or International Postal Money Order; Patron's Membership, $25; Life Membership, $250.

Membership inquiries and dues should be sent to Donald M. Peach, Secretary, Rte. 1 Box 282, Mena, Ark. 71953. The office of publication is located at Rte. 1 Box 282, Mena, Ark. 71953. Address editorial matters pertaining to the *Bulletin* to the Editor, Laura Louise Foster, Falls Village, Conn. 06031. Address advertising matters to the Business Manager at 1421 Ship Rd., West Chester, Pa. 19380. Second class postage paid in Mena, Ark. and additional offices. Bulletin of the American Rock Garden Society (ISSN 0003-0863).

VOL. 40 WINTER 1982 NO. 1

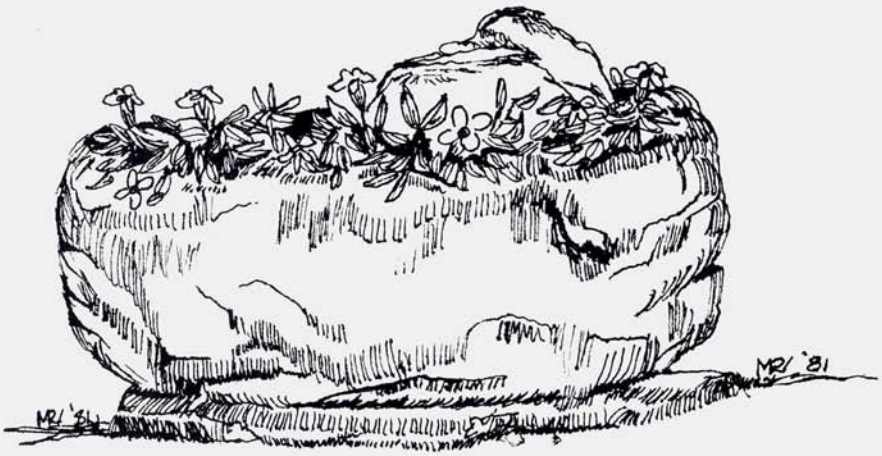
Bulletin of the American Rock Garden Society

Troughs As Micro-Environments

WAID VANDERPOEL
Barrington, Illinois
Drawings by Mark Vanderpoel

Rock gardeners across the continent are increasingly intrigued by troughs and containers as homes for their alpine treasures. My interest was no more than passive curiosity until I saw the marvelous display of troughs assembled by Vancouver rock gardeners as part of the First Interim International Rock Garden Conference in 1976. At every possible moment between lectures I found myself returning to this wonderful collection of hypertufa three by two foot rectangular troughs, each one grouping plants from a particular North American mountain range. My enthusiasm was tempered by learning that the troughs had been moved into place by a lift truck. However, the fascination of being so close to these little plant gems, each trough bringing a whole region to life in my mind, produced an intense interest in learning more about this specialized form of gardening. As the conference closed, Jim McPhail and his associates staged a trough making demonstration. I then knew our family, too, could make these containers. I was hooked!

Returning to Chicago we built forms and cast replicas of the troughs we had seen in Vancouver. Come spring of 1977, we mounted our first three troughs on concrete blocks. In one we wedged plants from the European Alps among limestone rocks. In another we



featured small plants from the Colorado Rockies, while the third became home to a collection of shade lovers. During the summer and fall our plants throve in their new environments. Drainage, soil, light and moisture all seemed ideal. We could hardly wait for spring and the pleasure of close encounter with our alpines as they burst into flower.

Winter came and the plants looked lovely and green when not covered with snow. Finally April arrived. To our utter dismay, the plants, instead of exploding with new life, disintegrated into mush. Winter freezing produced a ninety percent mortality rate. We learned — oh, so painfully — that in the Midwest one cannot leave troughs up on concrete blocks for the winter. I will leave it to others to explain whether the culprit was wind induced sharp freezes, alternate freezing and thawing, or yet another explanation. We knew only that changes would be necessary.

In 1978 we built small, portable containers as well as several more three by two foot planters. Again, the plants throve in their especially constructed homes. In the late fall we moved all the troughs down to our wind sheltered lower patio and surrounded them with oak leaves. Despite another severe winter our efforts were well rewarded; there were almost no casualties. The insulating quality of the oak leaves kept the soil in the troughs frozen and the plants dry and dormant during thaws. In the spring of 1979 the Wisconsin-Illinois Chapter hosted the ARGS Annual Meeting and the Vanderpoels beamed with pride over our young trough collection.

Much as we gardeners may long for a natural rock outcropping or a steep east slope, most of us are doomed to practice our horticultural efforts on a relatively flat surface. Some of us get too much sun, others have too little. We'd like a combination of gravel and humus; we have heavy clay. In short, soil, light, and exposure are seldom ideal. Improvement is generally difficult, temporary, or even impossible.

By utilizing containers the gardener gains a new control over his plants' environment. Too much sun? — place the containers to receive noonday shade from house or tree. Containers can be given ample sun in spring and fall, then moved to shadier locations for the summer. An overly shaded condition can be partially offset by sloping the surface of the trough towards the sun; containers

can be constructed with sharp slopes to simulate a northeast facing hillside. With a little effort we can achieve, and maintain, a special soil mix. We can create ledges, overhangs, or any specific condition we wish to simulate from nature. We recently built an easily portable twenty-two inch long container with a hollow center ridge rising above side planting pockets. Holes drilled into the ridge will make homes for a dozen small plants reputed to require super-drainage. The only limitation in trough design is in the imagination of the designer. Our chapter boasts a group of talented artists and sculptors, so heaven knows what innovations will be forthcoming.

Even with a large stationary trough, considerable variation of light can be achieved by positioning plants in relation to the sunny or shady sides of the rocks in it and by using various surface slope angles. Simply put, hyperfufa containers allow us to create specialized microclimates.

Plant combinations can be selected based on a desire to create regional groupings; by plant affinity for specialized soil or light conditions; or to achieve either an extended bloom sequence or a one time "shoot the works" display. In the latter instance, three or four small troughs could each take their turn at "center stage" over the course of a blooming season. We have come to favor a combination of these plant groupings.

Most of our large troughs feature plants from a specific mountain range. Under our south facing front eaves, a planter features hardy cactus and high plains plants from Wyoming, which thrive in this dry, exposed, sunny spot. We observe that even our non-gardening friends find interest in the contrasts in the foliage textures in our adjoining Alps and Colorado troughs. We have also highlighted the dissimilarities in these regional troughs by utilizing a different variety of rock in each container. Gardeners who live fairly close to a well stocked rock dealer may obtain at reasonable cost a choice of interesting material.

We generally cover at least half the surface of the larger troughs with rock. If you are fortunate enough to have available tufa, pumice and porous limestone, the rocks themselves can serve as plant habitat. With some trial and error, the rocks in larger planters can be arranged to create miniature fell fields, outcroppings or ledges.

Some of you may become intrigued by the potential for achieving a wider range of conditions than may be feasible in your garden. Others may desire to explore the possibilities of composition, of creating a living art work. The question now is – "what plants?" Why not try experimenting with a variety of small alpines and other wildflowers. Our Western troughs feature selections of erigerons, townsendias, drabas, armerias, *Hymenoxys grandiflora*, thlaspi, dwarf ferns, and *Silene acaulis* as well as the smaller penstemons, polemoniums and aquilegias. A lovely little dodecatheon has graced one Western trough for the past two years. Our Alps trough is home to a number of European mountain primula, two species of androsace, *Gentiana acaulis*, saxifrages, semps, and an *Anemone baldensis*. Our smaller containers combine small cushion dianthus, saxifrages, drabas and androsaces and I plan to grow *Edrianthus pumillio* this winter for use in troughs. Tiny ever greens such as *Picea glauca* 'Echiniformis' appear well suited for containers. It is amazing just how many little plants will thrive in close proximity in a trough. In our standard planters we find no trouble in maintaining from thirty-five to forty-five plants.

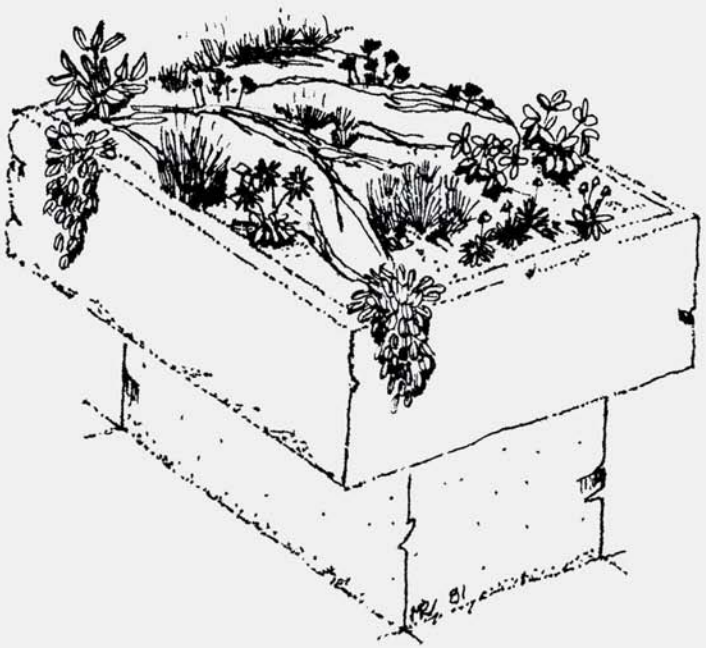
The seeds of many difficult to grow subjects will germinate sufficiently well

to provide seedlings with which we can experiment in order to discover their preferences of soil, light, and habitat. Not only can a wide variety of sites be chosen but by moving smaller containers temporary adjustments can easily be effected: if your Kabschias suffer during a prolonged wet period, simply bring the container under a rain shelter. Troughs do dry rapidly, especially small ones; however, they are quickly watered. Few weeds develop in our containers and the almost effortless removal of weeds from a raised trough is one of a gardener's minor joys.

Last winter we constructed a free-form trough of heroic proportions — nearly five feet in length. Since lifting it is out of the question, we are experimenting with a new winterizing technique. We surrounded the trough with chicken-wire, then packed oak leaves under and around the trough. After the first deep freeze we also packed oak leaves over it. As previously mentioned, we have used this oak leaf insulation around the containers in their winter home on the patio with great success. In the spring we peel off the leaf and ice cover in layers, as the slow thawing action permits only partial removal at any one time. If the leaf protection under as well as over and around our large trough succeeds, our days of lifting and moving the larger planters are over.

The opportunities to experiment with design and the creation of individual habitats seem unbounded. Also, it is a special treat for a six-foot-four-inch gardener to be so close to those bright and charming little jewels.

Yes, I'm hooked on troughs. §



PENSTEMONS AND OTHER WESTERNERS IN TROUGHS

Part I — Why Troughs?

MARK MCDONOUGH
Norwood, Massachusetts
Drawing by Sukii Saito McDonough

Within the past several years, trough gardening in this country has become increasingly popular. Any alpine enthusiast's garden will almost certainly feature a trough or two, sited conspicuously or as a focal point, and filled with the choicest cushions nestled among chunks of tufa. Although troughs are ideally suited to the display and viewing of small plants, many other benefits are attributable to trough culture. My interest in troughs originated from the need to accommodate the special cultural requirements of Western American plants, reputedly difficult to grow and flower in the unpredictable New England climate.

Surprisingly, a wide variety of these Westerners will survive temporarily in the conventional rock garden, but usually prove impermanent and temperamental. Winter wet poses a problem to dryland plants, but by far the most serious threat is excessive summer heat accompanied by stagnant humidity. During an extended spell of humid weather it is not unusual to see a seemingly healthy plant suddenly go limp and turn to a mound of mush in one day's time, a most frustrating experience. Extra drainage and perhaps a bit more shade than normal may be provided to compensate for these adverse conditions. Tragic demises can be further minimized by bearing in mind a frequently overlooked yet essential consideration — the need for air drainage. Plants growing in the trough are elevated above the garden floor, and thus afforded improved air circulation; the mush syndrome becomes less of a problem.

The key to ensuring longevity when growing penstemons and other Western American plants seems to be hardening off each year's growth. Many plants indigenous to arid regions require a thorough drying or baking period to secure a perennial habit. In a trough this can best be achieved by providing a soil mixture that will allow the sharpest possible drainage, and then by locating the trough where it will get a good deal of sunshine. I have found, however, that many plants normally requiring total exposure to sunlight will in fact grow and flower in partly shaded locations. As a matter of fact, high open shade during the hottest part of the afternoon is advisable for the New England trough garden.

Another consideration crucial to the success of trough dwellers is proper siting. It is useful to understand how plants grow in nature so that similar conditions can be supplied in the garden. One can then make adjustments to compensate for climatic differences. Nevertheless, Mother Nature does her best to discourage the New England gardener. Prolonged soggy winter weather and premature thawing, followed by uncompromising frosts, account for many garden fatalities. The warm days of Indian Summer induce plants to break dor-

mancy, weakening their constitutions just before the rigors of winter set in. Severe cold, accompanied by unyielding winds, can dessicate even the hardiest of evergreens, particularly when snow cover is lacking. Inevitably we can expect an early thaw, best referred to as "fools' spring". The unsuspecting plants are easily deceived into believing that spring has arrived. They are baited on with soft rain and balmy temperatures — the trap has been set! Bearing these factors in mind, a site should be carefully selected to provide an amiable environment with protection from unfavorable conditions. Generally, a position that eludes the full blast of winter winds, avoids the deadly drip from overhead branches, and receives a fair amount of sunshine, is best. However, achieving a proper balance between sun and shade in conjunction with other variables can be a difficult task. Trial and error and an observant eye seem to be the best solutions.

In the several years that I have been using troughs I have noticed an overall improvement in my ability to grow these specialized plants. Species that proved biennial at best in the open rock garden are taking on more permanent characteristics in the trough. Many notoriously shy-flowering plants (at least here in the East) have put aside their fears and inhibitions, and are now dependably flaunting fantastic floral displays.

Soil mixtures are the subject of considerable discussion and varying opinion. Once again experimentation and experience give clues to the proper proportions of ingredients. These proportions must be tailored individually to meet the needs of the particular plants selected for each trough. Generally, the soil mixture should be composed largely of coarse sand and grit, with a small proportion of water retentive materials such as loam, vermiculite, or peat. A nutritive ingredient such as decomposed leaf mold should also be added, but with restraint. Too rich a mixture can result in uncharacteristic growth habits, and can adversely affect the flowering capabilities of some plants, as will be discussed later. Penstemons rejoice in these spartan conditions, yet many other genera will not survive such a lean diet. The proportion of ingredients has to be adjusted for different groups of plants.

One of the satisfactions derived from growing plants is meeting nature's challenges. The ravages of rodent and insect warfare are one of the challenges that the trough garden can help to meet. In my region, the damage caused by rodent pruning can be devastating, especially for the woody penstemons and other dwarf shrubs, often reducing them to mere stubs. Moles wreak havoc on bulbs and mat-forming plants. Field mice are their accomplices. Ants, with untiring diligence, tunnel into prize cushions, piling them high with sand. Slimy slugs and other ghastly gastropods devour the most cherished rarities. Plants placed in a trough benefit from their inherent segregation from the ground below, foiling these aggravating adversaries.

In addition, the trough brings a microlandscape close to the observer's eye, to view in detail selected plants that deserve keen inspection, intriguing plants so small that they would be passed up in the larger scale of a rock garden. It is becoming evident that the unique ability of troughs to provide any combination of soil mixture, drainage, and exposure, and a safeguard against pests, along with other built-in attributes, is good reason to utilize these planters.

Unfortunately, the use of troughs has been somewhat restricted by preconceived notions of where such objects are appropriate. Typically, a separate area is given over to the display of one or more troughs, often formal in their arrangement and alignment, and frequently ad-

joining other isolated garden structures such as a greenhouse or patio. I consider the trough to be an extension of the rock garden and therefore warranting a more intimate relationship with the landscape. I propose the siting of troughs directly in the rock garden in an attractive and harmonious arrangement. Using this method, the smallest and choicest plants in a collection can be singled out, not to be coddled in an alpine house, but rather to coexist adjacent to their larger and perhaps overbearing companions, yet protected within the confines of the trough environment.

The Plants

And now we arrive at the best part — the plants! the number of plants that are suitably compact and slow growing for use in a trough constitutes an inexhaustible resource. Yet care has to be taken to select only the smallest and slowest growing species. It is easy to put in small plants that look appropriate only to find in a year or two that they have far exceeded their bounds.

Dwarf shrubs are particularly desirable for adding character and scale to the trough planting. It is here that I look to the immensely varied genus *Penstemon*. It offers many exciting dwarf woody plants with brilliantly-colored blossoms.

Penstemon davidsonii

One of the most notable species is *P. davidsonii*. Its nomenclature is a problem, depending on the author cited. The plant may be listed as *P. menziesii* var. *davidsonii* or more commonly the reverse is recognized, with *P. menziesii* as a variety of *P. davidsonii* and written as *P. davidsonii* var. *menziesii*. The type plant is sometimes distinguished by the name *P. davidsonii* var. *davidsonii*, but I will refer to it simply as *P. davidsonii*.

This plant is well-known for its reluctance to flower in New England. As a matter of fact, the construction of my first trough can be directly attributed to my frustration with trying to get this "pent" to flower. My several plants seemed perfectly happy in a variety of sites, reliably spreading into dense green mats of tiny leathery leaves, yet for years refusing to flower. One autumn, after a feeding of well-rotted manure, one blossom was produced. I envisioned what a fine sight it would be to see this emerald carpet studded with large rich violet flowers. It was then that I decided to build a trough in an attempt to furnish this fuss-budget with better conditions. I used a soil mix consisting of 75 percent sand, 15 percent peat, and 10 percent loam. The penstemon and a variety of other plants were placed in the trough among carefully arranged stones, and mulched with gravel. The following spring, *P. davidsonii* was in full bloom for the first time. The tiny mat of round lentil-sized leaves was spangled with hundreds of long-tubed lipped flowers. The blossoms are large for the size of the plant, and are borne in pairs (occasionally in threes) on bright red stems rarely exceeding two inches in height. The plant is most fascinating, almost comical, when bearing its swollen buds with constricted mouths looking like a sea of gaping goldfish (see cover illustration).

This is a plant that deserves close scrutiny in the trough. Penstemons typically have bearded flowers, and a look into one of these fish-mouths reveals two raised ridges in the throat, each wearing a fuzzy lavender beard. Each flower is held by a conspicuously large glandular calyx of deep red, in itself very attractive. The petals are fused, thus forming a tube lobed only at the end. The flowers exhibit the common penstemon arrangement of two upper petals and three lower ones. Flowering begins in May and lasts for a whole month, longer than some of the other spring-flowering pens-

temons.

I must emphasize that this is an ideal trough plant — even when out of flower — because of its neat evergreen nature. The dense mats of glossy leaves are attractive in all seasons, but are most impressive in autumn and winter when the leaves become finely edged in red. The red coloring gradually permeates the whole plant, a characteristic common to many penstemons.

This penstemon roots vigorously as it travels, although it will trail unrooted over bare rock ledges for a good distance. The rooted branches are unquestionably hardy, but the stems that are not rooted are subject to winterkill. This seems true of other root-as-they-go plants as well. *P. davidsonii* can be propagated simply by detaching a small rooted piece and planting it directly in the location desired. Stem cuttings are another method of propagation; these strike easily any time during the growing season when placed in sand. Seed is an alternative that may be tried; however, in their early days, the seedlings can be somewhat slow and tricky to keep. Sowing seed directly in the garden is very effective in producing healthier plants in less time than greenhouse-sown seed. Cold is essential for best germination.

The only disadvantage of growing specimens in the rapidly draining sand mix is that they suffer dieback or browning during the summer months. Fortunately, plants respond well to pruning. I noticed that this browning effect is a normal occurrence in nature, and does not seem to affect seriously the following year's performance. Plants growing in rich soil remain robustly green and suffer little dieback, but never flower. Perhaps a compromise is necessary.

Eriogonum caespitosum

Contrasting beautifully with the deep green of the penstemon is another dwarf shrub in shining silver, *Eriogonum caespitosum*, a particularly fine member of the Buckwheat Family. The genus *Eriogonum* embraces a vast race of desert, dryland, and alpine plants, yet they remain virtually unknown in the gardening world. The genus certainly does contain some weeds, but what a shame to neglect this large group, for within it one will encounter some of the finest American cushion plants.

Eriogonum caespitosum ranks among the best, a very dwarf shrubby plant with a densely branched woody caudex. Leaves are tiny silvery-white felted spoons held skyward on thin stems, really most intriguing. Plants are extremely slow-growing. One five-year-old plant has spread into a domed mound five inches across and one and a half inches high. Dead leaves tend to persist on the lower portion of its leaf columns, but are not apparent under a canopy of fresh growth. During extended rainy periods the leaves crinkle a bit and take on attractive pink and bronze shades. I'm amazed that such a densely tomentose plant holds up so well in soggy weather. Equally surprising is that this plant has flowered better in a partly shaded exposure than other plants of the same species in full sun.

Eriogonums are typically variable in form and color, and good color forms should be selected and propagated. *E. caespitosum* can vary from deep yellow to unusual copper, orange, and tangerine tones. Poorer color forms are frequently met in cultivation, but the flowers are always fascinating regardless of color. Plants in my garden produce diaphanous pale yellow lollipop balls three-quarter inches in diameter on four to six inch pink stems that radiate horizontally from the mother plant, as if imitating a sempervivum sending out its chicks. As with most buckwheats, the chaffy flowers display the trick of open-

ing as one color, and gradually fading to another color. The specimens in my garden become tinged with pink, but are still not bright enough to make a show. The pallid balls of bloom are made somewhat more conspicuous by the stamens, which protrude beyond the petals, creating a soft, fluffy appearance. If some of the best color forms were selected, this species would certainly be a treasure in any garden.

Another factor contributing to the rarity of eriogonums in cultivation is the fact that propagation is difficult. Seed of species collected in the wild are offered in the seed exchanges, but rarely is the seed viable. If seedlings do appear they seem particularly prone to damping off and in general seem difficult to raise to any size. Division of established plants and making cuttings offer a better chance of securing good forms, although cuttings are not easy to root. Cultivation can be very difficult for many species; planting in virtually pure sand ensures the necessary drainage, as excess moisture is their most ardent enemy. *E. caespitosum* seems perfectly hardy — in fact downright easy — given these spartan conditions in the trough.

My success with these delightful miniatures in troughs and the surrounding sand beds has led to experimentation with other species of *Penstemon* and *Eriogonum*, and with other genera. These will be the subject of further discussion in the next part of this article. §

Another Wrinkle in "Stone" Troughs

Photograph by David Thomas

Growing alpines in troughs has become more and more popular, not only among bonsai enthusiasts and rock gardeners who have a minimum of garden space, but also among those who have acres to cultivate, but appreciate container growing for decorative and horticultural reasons. A trough, enhanced with a knobbly, lichened rock or two and perhaps a single dwarf tree or shrub, along with an assortment of suitable rock garden plants is a very attractive addition to terrace or patio and a collection of such plantings makes a fascinating display. Tiny plants, which frequently look insignificant in a larger setting, take on a new dimension when framed in a well landscaped trough and can be more easily admired when brought up closer to eye level, where the fragrance of many of these "belly plants" can also be better enjoyed.

Many expert plantsmen have found that troughs are also the answer for those difficult alpines that require special conditions not always easy to reproduce in the garden. Plants all requiring the same conditions can be grouped together in a planter filled with an especially formulated soil mixture, given precisely the amount of sun or shade they require, and a watering or drying off schedule suited to their particular needs. Plants of doubtful hardiness or needing dry summer or winter conditions can be protected during cold or wet weather either by covering the trough with an individual portable frame or by placing it in a standard cold frame or alpine house during certain seasons of the year. The uses of a trough are endless.

But troughs are not easily come by and for this reason the Bulletin has from time to time published articles on how to

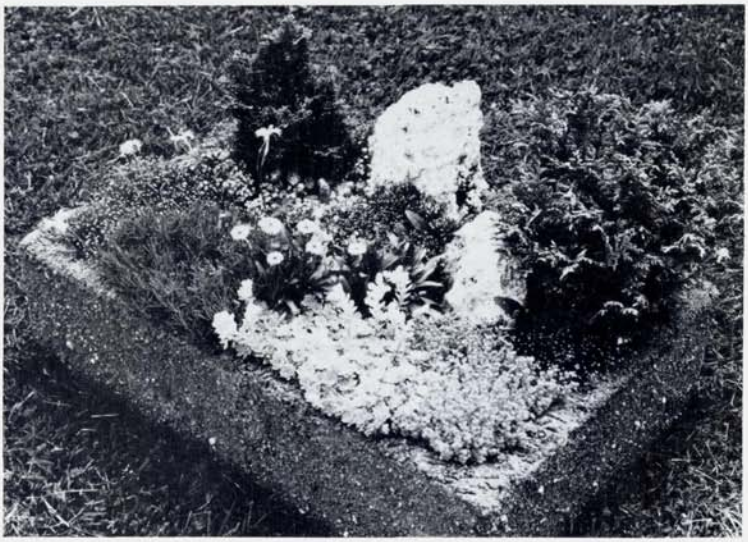
make them. Three ways of forming them of various mixtures of hypertufa are described in Vol. 35, pp.125 to 131 and a more detailed illustrated account of one of these methods can be found in Vol. 22, pp.99 to 103. In addition, your ARGS Book Store has available xeroxed instructions for making hypertufa troughs.

All of these methods of making troughs of hypertufa require, however, cement, peat, sand, vermiculite or perlite, and water, and a certain amount of work space in which one can muck about with cement mixing. And, though a trough made of a peat-perlite-cement mixture is relatively light weight, one made of the standard hypertufa mixture, incorporating sand, can be very heavy indeed. A new method of trough construction invented by Charles Becker, Jr. of Haverford, Pennsylvania dispenses with hypertufa, and a trough twenty-two by sixteen by six inches deep made by his directions weighs no more than twelve to fifteen pounds despite its stone-like appearance.

The basis of Mr. Becker's planter is a Styrofoam container, which is lightweight, waterproof and provides insulation. A Styrofoam picnic chest, either purchased or scrounged off the local dump, or a Styrofoam container such as those used for shipping frozen steaks and some electrical appliances makes a good foundation. It can be sawed like wood to the depth wanted and interior partitions, if any, can be removed with a knife. A curved, serrated grapefruit knife makes an excellent tool for this purpose.

The next step is to paint both the inner and outer surface of the *bottom* of the container with asphaltum roof paint or blacktop sealer. When this is dry, turn the container upside down and drill half-inch holes in the bottom about four inches apart to provide drainage.

One should have on hand a mixture of coarse builder's sand, fine gravel and, if wanted, broken shells to coat the outside and upper edges of the Styrofoam box. This gravelly coating is fastened to the Styrofoam with epoxy glue and, as it is the finish coat, should be selected for its



Trough with Styrofoam core

pleasing texture and color.

Working on one side at a time, coat the container with a well mixed batch of epoxy resin and hardener — one part of each, using a stiff paint brush for this purpose. Then immediately sprinkle some of the sand-gravel mixture over the gluey side. Sometimes it may be necessary to dribble a little additional epoxy over the sand-gravel to make sure it adheres. Allow at least half an hour for the epoxy to set on each side before coating the next. Within twenty-four hours the sides of the container should be thoroughly dry. Brush off any loose sand with a soft brush and touch up thin spots with more epoxy and sand. Be sure the edges and corners are thoroughly coated so the white Styrofoam does not show through. It is also wise to extend the sand-gravel coating on the rim of the container a few inches down the inside surface so that there is no chance that the Styrofoam will show above the soil level of the filled planter.

As soon as the coating is thoroughly dry, the container may be filled with an appropriate soil mixture and planted. A mix of equal parts of good quality garden loam, coarse sand or gravel,and humus (coarsely sieved leaf mold or peat) makes a good standard soil mixture. A greater proportion of sand and gravel and less loam may be used for those tricky alpines that need a well drained (aerated) soil, while more humus can be added for woodland plants. Where a limy mixture is desirable, lime chips or oyster shell can be used as part of the gravel component. A little charcoal (natural, *not* briquettes) added to the soil mix is considered by some growers to be beneficial and a *small* quantity of organic fertilizer (one cupful each of bone meal and dry sheep or cow manure for each wheelbarrow-load of soil mixture) may also be incorporated.

The drainage holes should be covered with large pieces of broken crockery or with aluminum or plastic (not copper) window screening before placing the soil in the container. The soil should come up level with the rim of the planter as it will sink. It can be raised even above this level to give additional depth by the judicious placement of rocks to shore up mounds of soil.

It is easier to place the rocks and insert the plants (and rearrange them as wished) if the soil mix is quite dry. After, and only after, everything is in place, it should be thoroughly watered until the water runs through the drainage holes. A fine rose spray should be used for this purpose to prevent excessive washing of the soil and it is usually best to sprinkle a gravel topping over the soil before this initial watering. After watering more soil mix can be added over this gravel if needed to fill in low spots but, except possibly for woodland plants, it is quite essential to end up with a fairly heavy topping of gravel over the soil. This will not only make an attractive background for the miniature plants, it will help prevent soil erosion and unsightly and smothering mud-splash onto the leaves and blossoms during heavy rains. Perhaps even more importantly, it will give the plants a quick draining mulch around their crowns and a dry, clean surface on which to spread out. The greatest enemies of alpines in our relatively hot and humid lowland gardens are the pathogens that cause mildew and rot and a gravel surface under and around the plants will do much to protect them from such fungus diseases.

Raising the container on bricks or cement blocks will keep the drainage holes from plugging up and help prevent water-logging of the soil during wet weather. It is wise, however, in winter to lower the container to the ground if possible to prevent excessive drying at the roots when the soil in the trough is frozen

and cannot absorb moisture. Winter covering is usually not essential if the plants are naturally hardy in your area, but a few pine boughs laid over the container will prevent sunscorch of evergreen material.

During the growing season it will be necessary to water the planter if the weather is dry, but be careful not to overwater as Styrofoam, unlike hypertufa, is impermeable to water. If, during the heat of the day, the plants flag, this probably merely indicates the leaves are transpiring faster than the roots can take in moisture; if, however, the plants appear wilted in the early morning, this means the soil is dry and watering is essential. It is preferable to drench the trough thoroughly once in a while so the water runs out through the drainage holes rather than give frequent light waterings.

If fertilizer was incorporated in the soil mix there should be no need for further feeding during the first year, but thereafter a light fertilizing two or three times during the growing season may be beneficial. These are usually best given by watering the container thoroughly with a weak solution of (preferably) organic fertilizer such as fish emulsion in early spring, early summer, and late summer or early fall. Do not over fertilize.

With proper care plants should live happily without replanting in fresh soil for a number of years. Some planters containing thriving plants have not been replanted for as long as eight to ten years. This, however, depends somewhat on the type of plants in the container. Strongly growing plants and dwarf trees and shrubs may fill the entire soil mass with roots within three to four years, robbing companion plants of nutrients and water and eventually dying themselves of malnutrition. If the roots begin to grow through the drainage holes it is usually a sign that replanting is necessary.

Mr. Becker says that his Styrofoam troughs have been out in all weather for the past five years and show no signs of deterioration. He reports that because Styrofoam is a good insulator the soil stays cooler in such a planter than it does in one of concrete or rock. Interestingly, he gave one of his troughs to Longwood Gardens in Kennett Square, Pa. to test. They used it in the experimental greenhouse to grow arctic plants over refrigerating coils, but its insulating properties were such that it did not work for this purpose. Perhaps they should have tried placing one with the refrigerator coils inside the trough. §

Photo by courtesy of *House Plants and Porch Gardens* magazine, Box 2461, Boulder, Colo.

THE CARE AND FEEDING OF TRILLIUMS AND OTHER MATTERS

EDITH DUSEK
Graham, Washington

At one time or another each of us has felt an empathy for the bemused soul who first commented, "We grow too soon old and too late smart." In dealing with plants, sometimes we are not granted the chance to profit by our blunders, for that longed for opportunity to possess a particular plant occurs only once. If we muff it, there is a peculiar poignancy to being both sadder and no wiser.

Some plants equal the human race in their ability to tolerate all manner of vicissitudes and still struggle onward. Unfortunately we tend to look at a plant and believe that, because it is living and reproducing itself in a certain situation, this is what it must have. In the garden, if we unthinkingly mistreat a plant and it survives, we delude ourselves into believing that this is the way one should handle it. Trilliums have suffered from more than their fair share of such misunderstandings.

Someone once bemoaned the fact that trilliums were objectionable in the garden because they lost that elfin quality one associated with plants growing in the wild. This is a little like lauding the looks of a starveling refugee child while spurning those of the well fed child in happier circumstances. All too often trilliums (and one suspects other plants as well) grow where they do, not so much because they must have such conditions, but rather because they can endure them and still reproduce while potential competitors cannot. This situation was brought forcibly to my attention one day when I was scouting a population of *Trillium rivale* in an effort to discover the incidence of polymerism among them. All plants were quite similar in stature and petal size but one. This one was so noticeably robust in all its parts that it seemed a worthy candidate for future study. However, when I commenced clearing around it the reason for its prosperity came to light. A small creature had chosen this spot for its toilet facilities and the plant was enjoying this "manna from heaven" to the full. So much for the often repeated theory that one should never fertilize wild flowers, particularly with animal manures. I have used liquid fish, horse and cow manure to the plants' advantage and have also top-dressed trillium with horse manure when the plants are below ground with no ill effect, quite the contrary.

In order to understand how best to handle a plant, it behooves one to know how it grows. In explaining such things, one generally starts at a dormant period and progresses from one step to the next. Unfortunately, trilliums may be numbered among those plants which do not indulge in true dormancy and those periods which pass for such are not necessarily optimum times for interfering in their lives. Since the appearance of the above ground portions of the plant generally is accepted as the start of things by the gardener, perhaps it is well to start there despite the fact that the plant has been busily going about its affairs for some time.

Above ground portions of the plant are the product of a bud, which is most often produced by the anterior end of the rhizome. This bud is twice wrapped for protection while it is below ground. If

two shoots are to emerge from this point, each has one wrapper of its own, but both share a single outer wrapper. When the latter finally disintegrates, it leaves behind a constriction on the rhizome. By counting each of these, one can gain some insight into the age of the plant. Since there is also generally some deterioration at the posterior of the rhizome, such attempts at aging a plant can only be approximate. Even so it usually astonishes folk to learn that ring counts of a single-stemmed wild plant will often indicate ages of from one to seven decades. No one seems to know just how long these plants are capable of living.

But, to get back to our newly emerging trillium in the halcyon days of spring. If one has the misfortune to break away this new shoot, next year's shoot will be found nestled in the hollow left by its removal. Obviously then, whatever happens this year will have repercussions in the following one as well.

Before the flower is full blown, the portion of the rhizome which produced it will put forth several nubbins of new roots. It seems not generally known that these roots can only be produced at this time and from this portion of the rhizome. In their first season they concern themselves largely with the mere act of extending into the soil. In their second season they become strongly contractile and pull the rhizome to comfortable depths, a function which does not extend beyond their second year.

The life expectancy of these primary roots is about nine years.From them spring secondary or feeding roots. If the primary roots become broken (but are not completely removed) they are capable of making summertime replacements of the feeding roots. Apparently this activity does not extend beyond the autumn months. The primary roots seem to gradually lose this ability as they age; that is, while they are functional if undisturbed, the older ones can no longer produce those much needed feeding roots if the plant is carelessly handled. If the primary roots become dried beyond hope of recovery or they are completely removed, then the plant must wait for the proper sequence of events to form a scant supply of new ones. Obviously, a plant which is accustomed to the offices of nearly a decade of roots to keep it in groceries is going to find life quite difficult for some time into the future if the major portion of them is lost.

Plants which are shipped in the spring as they are just starting into growth will experience considerable difficulty in adjusting to their new homes. Not only must they put forth new top growth, but the roots must also make fresh contact with the soil. Often plants arrive with roots mangled or dried beyond redemption. The plant calls upon its rhizome for reserves to push forth the shoot. If these emerge while the plants are in transit, distorted tops may never come erect. The plant may endeavor to produce a blossom. It remains above ground but fleetingly—and all too often, it dies.

If plants must be shipped, probably the easiest time to do so is in the fall, providing of course, that all due cautions are taken to keep the roots moist enough to remain viable. Plants can be shipped in growth, but it takes expert packing to prevent damage to the tops in transit. Properly done, it is superior to fall shipment for the plants can then use the summer months for new root development. Unfortunately such shipments are inherently expensive.

All too often the weather conditions are not to be relied upon when plants arrive and even with the best of handling, the tops may have become wilted. As a matter of course, I plunge new arrivals in a deep container of water in which a small pinch of commercial fertilizer is dis-

solved. They may be left thus as long as overnight by which time the tops will have become turgid once more. Care must be taken to avoid snapping brittle stems when handling them at this point. Plants are potted in containers large enough to accommodate not only the roots currently present but the hoped for large supply which will form in the summer months. For plants with rhizomes the size of *T. ovatum*, this generally means a gallon container or larger.

Stems which are bent or cracked but not completely severed should be splinted with a wrapping of florist's tape or layers of aluminum foil. Taped stems (and those which are excessively long) should be tied to one or more small stakes. If the foil wrap extends below soil level, it will usually be strong enough to support the stem with no additional help. Plants are then removed to the self-water bench where they are shaded and a steady supply of moisture is assured. Here they are given several weak feedings of liquid fertilizer during the summer. *(A description of how to construct and use a self-water bench will appear in a future issue. –Ed.)*

Plant collection is best done after the shoots are fully formed; however, if it is a matter of the trilliums being rescued from "progress" one does what needs to be done at any time of year. Somewhere I came across an article that advised planting trillium rhizomes just under the soil surface. They certainly don't grow that way in this part of the world. I like to take a shovel when I'm out prowling for trilliums. I clean away the duff and then drive the blade of the shovel down to its full depth and jump on it a time or two. The chances are this will get below a good portion of the roots. It's rare when they don't go down that deep. If it is something really special, I hand dig until I find the sheath, then I use the shovel, pushing it down to its full depth. It is not particularly unusual for *Trillium rivale* to have rhizomes down fifteen to eighteen inches. It beats me how those squinny little rhizomes can store enough go-power to get the shoot up into the light of day. If the weather is reasonably cool and moist, freshly dug plants in good condition may be set directly into their new homes. After-care in the form of regular watering and frequent weak feedings of liquid manure or fish fertilizer will go a long way to minimize the effects of transplanting. Bone meal applied as for most bulbs is appreciated by most species.

Any plant which has just been moved is fair game for the munchers. Slugs are especially fond of new arrivals. I don't know if they are particularly attractive to slugs because they have not taken on the flavor of the surrounding vegetation or if they exude some sort of stress aroma. It is certain that any plant suffering from the "toos" (too wet or dry, too shady or sunny, etc.) attracts slugs like flies to the manure heap. A scattering of slug bait helps.

Trilliums are very variable in the time they choose to remain above ground. The drying off process should never be hastened in any way for the longer the plants remain green, the stronger they will be. As plants lose their tops, they are taken to permanent homes in the garden. Some species remain green as late as October or November (generally specimens of *T. ovatum* are the last to get sleepy), but by August, inspection of the plants in containers will disclose that the greedy roots are making their way through the bottoms. This is always an uneasy time for me for any form of root damage is undesirable, but it is best to wait until there is a cool rainy spell to put the plants in the garden.

Soon after the tops die down it will also become apparent that a number of plants will have next year's shoots well formed and the sheath will appear above

the soil. At first I was dismayed by the premature appearance of these growths and solicitously heaped sawdust or compost over them. The plants thanked me for meddling by inching above this blanket until they were as tall as before. After being outwitted a second time by the plants, it dawned on me that perhaps they knew better than I what was best for them. Cold (sometimes a week or two of temperatures to near 0°F. with no ameliorating snow blanket) seemed to do no harm . The tips are, however, vulnerable to careless feet and slugs with gourmet appetites.

While such fall sprouting would seem to be the ultimate in futility, perhaps it is not so at all. The sheath is quite translucent and undoubtedly admits enough light for the plants to utilize in the tenderer days of winter. The precocious appearance of tips in autumn has no apparent bearing on the early blooming of the individual for some plants which thus indulge themselves are among the mid-season bloomers.

Plants which have been moved the previous season or have been divided often send up extra stems. It is unclear whether this is a response to being disturbed or a sign of thanks for the tender loving care accorded them after their experience. In any event, the rewards of a good feeding and watering program consist not only of having the plants reach the peak of their genetic potential in as short a time as possible but also of having them develop into fine clumps which make them an asset to any garden.

I have not yet tried notching or otherwise cutting up the rhizomes to get trilliums to multiply. So far I have relied on encouraging natural increase by giving the plants lots of organic matter, a steady supply of moisture and frequent light feedings (about ¼ the strength one might use on most perennials). I can't say all kinds or even all individual specimens of all kinds will respond by producing larger clumps faster under this regime, but so far the results have been very good. Last year I divided a clump of double *T. grandiflorum* into fourteen or fifteen portions, each with at least one strong growing point. I would not do this every year or even every other year, but the division of such large clumps, when one has but one, seems a means of ensuring against loss. If plants can be coaxed into multiplication by the simple expedient of feeding them, for most of us the process of mutilating the rhizome in one way or another to get increase would seem to be unnecessary.[2] *(See note at end of article. – Ed.)*

Many people seem to be more or less terrified at the thought of dividing trilliums. There is no need to be. Indeed, it is an excellent form of insurance against the possible loss of something which might be unique. It is inevitable that following such an operation there will be at least one season's check in the growth. How long this lasts depends upon how large the portions are and how well they are cared for afterwards. If one would have one's cake and eat it too, then set the largest portion aside where it will grow on indefinitely as a feast for the eyes. The remainder should be turned into "cupcakes" for sharing with friends and as a source for future divisions. With plants, sharing is the only real form of insurance one has, for if perchance some evil should befall one's plant despite all one's best efforts, one can generally get a fresh bit for a start from those more fortunate.

Division is a fairly straight forward matter. The only plants which are not candidates for this operation are those in which two or more buds all arise from the same growing point. Others should have one or more growing points per division with as many roots as possible. After-

care is as for newly arrived plants.

Growing from seed often poses some problems. Seed which is not fresh may be slow to germinate or not come at all. Even fresh seed will take two years to come up.[1] It seems that the biggest cause of loss is drying. Seedlings succumb quickly if allowed to dry out. Best results here so far have been from pots kept standing on the self-water bench. Here again attention to a feeding program helps to move things along as quickly as possible. It is true that trilliums are not the fastest plants to coax from seed to flower (five to nine years), but if one is looking forward to a hearty four score and ten, what's the hurry? §

---

1. Trillium seed has double dormancy and requires a cold period of at least 8 to 10 weeks followed by, at the least, an 8 to 10 week warm period during which the radicle sprouts. Then another 8 to 10 week cold period is needed before the next growing season at which time the top growth sprouts. Seed must be kept moist at all times during this process. – Ed.

2. Various methods of cutting the rhizomes to speed up the vegetative reproduction of trilliums have been tried with considerable success. The most conservative of these is to dig down around the rhizome without disturbing the roots and, with the point of a sharp knife, circumscribe the rhizome about three-quarters of the way around its circumference just below the growing point with a shallow V-shaped notch. Or, alternatively, cut the notch the full length of the rhizome. Sprinkle the cut with powdered sulphur or some other fungicide before re-covering with soil. If all goes well, small "bulbils" will grow from the incision. These can be broken or cut off after they have produced one season's growth and planted in a sandy leafmold to grow on. Another method, somewhat more drastic, is to slice off the top of the rhizome just below the growing point. Slightly hollow the cut surface on the lower portion and after dusting with fungicide, re-cover with soil. Once again "bulbils" should form around the edges of the cut surface. The third and most drastic method is to dig up the rhizome and cut it, either vertically or horizontally or both, into a number of pieces depending on size. If dusted with fungicide and treated like root cuttings in sandy leafmold, each piece should eventually produce both a growing point and roots. It is probably advisable to try out such operations on ordinary specimens of a species prior to attempting them on a unique and treasured individual, as not all species may accept such ministrations with equanimity. It might also be wise to experiment with these various methods at several different times of year as better success may be achieved at certain periods of growth, though the period right after the top growth has died down is the time usually suggested for such operations. – Ed. §

• • •

Reginald Arkell is quoted in the Bulletin of the Alpine Garden Society as saying, ". . . You can't be angry in a garden." I wonder. — Which of us can maintain equanimity while weeding, when black-flies, mosquitoes, or gnats swirl in stinging swarms around one's head and one reaches with mud-caked hands for the insect repellent only to discover there's not a drop left? Or, when a gusty wind suddenly rises while one is raking leaves? Or, when the neighbor's dog waters the dwarf conifers and flaunts his virility by razing with vigorous kicking scratches a goodly portion of the scree including what were the rarest and most difficult plants? Or the slugs demolish one's only plant of *Phyteuma comosum*? Who, indeed?

ROCKY MOUNTAIN HIGH

ANDREW PIERCE
Evergreen, Colorado
Photographs by the author

My garden is situated up in the foothills of the Rocky Mountains at an elevation of almost 7,400 feet (approx. 2260 m.) and is perched on the southwest side of Independence Mountain high above Evergreen, Colorado. Here plant life takes on some interesting characteristics.

The soil structure is principally broken granite, from twenty ton boulders to fine grit. This certainly can be adapted to many rock garden plants; but, at the same time, such marvelous drainage occasionally has to be curtailed. There is some fine, slightly acid soil material, very low in nutrients, available, but this is quite sandy in character and also dries out quite rapidly. My principal mix is two parts of the fine soil (secured locally), and three parts of very well rotted horse manure (from the local dump, free for the carting). Some sections of the garden are built up according to the needs of the plants: for ericaceous plants with fine soil, peat moss and decomposing pine needles, for primulas less peat and only a little of the broken granite.

A factor not often of concern to lowland gardeners is the ultra-violet light as, predictably, its intensity at this elevation is considerable, though not comparable to that of the high alpine country visible to the west of my garden. I think we also often fail to appreciate the effect of wind and air movement at higher elevations. Unfortunately, due to the protective Ponderosa Pine and Douglas Fir forest in my area of the montane, this factor is somewhat diminished.

Much information on the kind of plant suitable for the rock garden, or for that matter in other types of gardens, can be gleaned by studying the local flora.

Why not use these instead of imported exotics? Montane flora of the Rockies consists of many diverse genera. A few of the noteworthy plants growing naturally on the periphery of my garden include Mountain Ball Cactus (*Pediocactus simpsonii* var. *minor*) in a wide range of blossom color from soft pink to rose rose, the very delightful but minute Spring Beauty (*Claytonia rosea*), which opens its small white flowers in the brightest of sunshine and masses of *Thlaspi montanum*, the very pretty, long lasting dwarf Mountain Candytuft. Alongside of these *Erysimum asperum* may grow to two feet and pulsatillas raise their nodding heads in myriads, from off-white to almost purple. Perhaps the most dramatic feature of the late spring is *Penstemon virens*, which covers the slopes in swaths of misty blue so thick you cannot walk without treading on them. These last contrast sharply with the orange-yellow of *Senecio integerrimus* and the more lowly *S. fendleri* around which pussytoes (*Antennaria parvifolia* and *Anaphalis margaritacea*) spread their gray foliage.

Local shrubs include *Cercocarpus montanus* or Mountain Mahogany with its peculiar twisting seeds; the ancient member of Hydrangeaceae — *Jamesia americana*; the large flowered Boulder

---

*Andrew Pierce, formerly Conservatory Superintendent at the Denver Botanic Gardens, has recently been appointed Assistant Director of the Gardens. He is currently the chairman of the Rocky Mountain Chapter of ARGS.

Raspberry (*Rubus deliciosus*); *Juniperus communis* for the evergreen effect and *Quercus gambelii*, here at its northern limit. Fall beauty is predominantly created by marvelous groups of composites of which asters such as the blue *A. bigelovii* and white *A. porteri* are spectacular. Additional color is produced by the autumn blushes of *Apocynum androsaemifolium* or Dog Bane and the interesting seed heads of *Yucca glauca* and Miners Candles (*Cryptantha virgata*). Down at the base of the hill in the moist groves of the Colorado Blue Spruce, aspen and alder, Shooting Stars (*Dodecatheon pulchellum*), *Viola canadensis* and the very often overlooked lowly Moschatel (*Adoxa moschatellina*) flourish. But we have wandered a bit too far away from the rock garden proper.

Before we actually enter my rock garden a few pertinent words regarding local weather may not come amiss. Gardening here is complicated by the uncertainty of weather conditions from season to season and from one locality to another close by even during the same day. One winter may produce over twelve feet of snow, which may remain on the ground for four to five months, while the next winter may barely see twelve inches and there will be so many record high temperatures as to make one think of perpetual summer. Watering must be done to alleviate the drought on the south side of the house whilst the north side (Primula country) remains almost frozen due to the 10 to 20 degrees of frost most mornings. Annual precipitation averages around twenty inches, but it may be plus or minus ten to that and because of the soil structure of decomposed granite the soil never stays wet for very long. It is not persistent extreme cold that damages our plants here but rather the extraordinary up and down shifts of temperature that plants are subjected to. One day can be in the 50's and the next, under a foot of snow, down to 10°F., frequently followed by the rapid disappearance of this snow cover as the Chinook or warm winds blow down from the mountains at speeds of up to 60 m.p.h. — sometimes more in localities such as Boulder, the windy city of the Front Range.

We will now step into the garden.

Initially my aim was to mass perennials with splashes of annuals to give my garden areas as much color, contrast and design as possible during the average period of frost free days. This is normally from mid-June to the end of August with the hope that this will occasionally be stretched by as much as six weeks in non-average years. This was the case in 1980, when we failed to have a killing frost from mid-May until September. But, perhaps because of my English background, including many days in the rock garden at Kew, my original thought turned towards the creation of a more diversified landscape to include a rock garden, peat bed, and an Asiatic primula border. These sections had to be built around some suitably placed natural boulders and, where there were changes in level, by constructing dry stone walling of native rock.

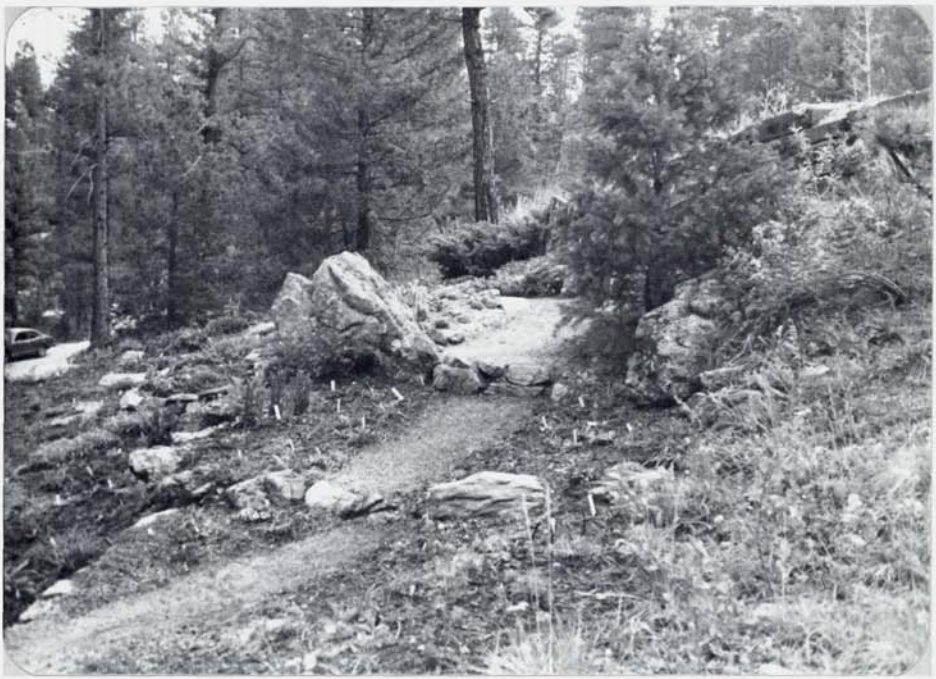
Across the top of a ten ton boulder, which had been positioned by the corner of the house during construction, were planted a mass of those oft despised sempervivums. In this inhospitable location they have produced a long lasting display of mainly pink and yellow flowers. With the high light intensity their foliage color is rewarding as well, taking on a beauty not always apparent at lower elevations. A higher dry wall facing northwest furnishes ideal conditions for a number of species and forms of lewisias. These detest artificial watering yet love to have cool roots. Here again is an example of plants that can be tricky in the ex-

treme down on the plains, but have proven easy at my elevation. And why not? The granite walls are first cousins to their homes in the Siskiyous and Wenatchee mountains.

The primula border is nearby on the northeast side of the house and last year the following species were planted there: *Primula leuteola, P. modesta, P. japonica* 'Fuji', *P. polyneura, P. watsonii, P. canescens, P. halleri, P. ioessa alba, P. saxatile, P. denticulata* and *P. geranifolia.* Even at this time of writing (last day of January, 1981) many of their foliose heads are poking their way up through the light mulch of pine needles. The soil mix of three parts of the local fine soil, two parts of well rotted horse manure, one part granite chips (half inch down), and one part peat is frozen almost continuously from October until the early part of April, yet nature does not let its plants go to sleep entirely. In a similar situation, though having an hour or two more sunshine, are borders of Colorado Columbines and lilies that make surprisingly complementary plantings.

Another fairly recent project has been a peat bed at the base of a very large spreading *Juniperus communis.* This is, perhaps, too large for the general design but it was naturally planted so its beauty has an intrinsic value. Here ericas, hostas, *Arctostaphylos nevadensis, A. patula* and the like are being encouraged, along with the native *A. uva-ursi,* growing in damper adjacent areas. In complete contrast, a few feet away, a planting of Cholla (*Opuntia imbricata*) is being tried along with other hardy cacti as an experiment at this altitude.

The two most prominent features of my rocky pathway are the scree and the raised beds. These were constructed in order to obtain an adequate depth of soil

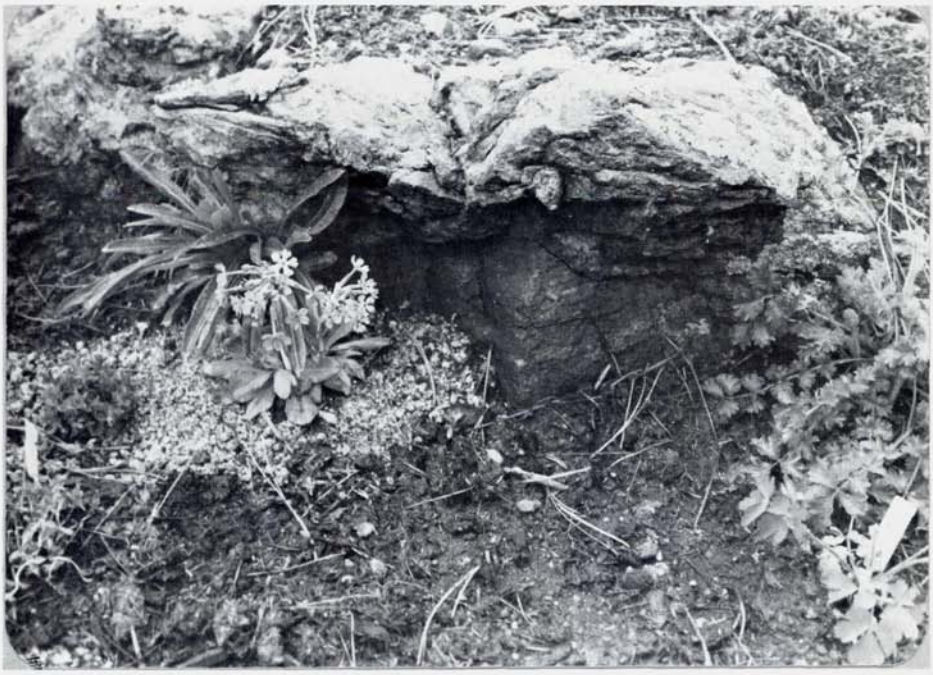


West-facing slope of garden

Small cacti above raised bed

above the underlying rock, which was scraped bare during building operations. Over these dry walls *Veronica pectinata*, *Mazus reptans* and sundry low penstemons spread their beauty. In the crevices sempervivums, a number of rock ferns and *Boykinia jamesii* flourish according to their moisture requirements. One fern, *Woodsia oregana*, a local native, was already established and the dry walls were built up and around this to protect it in situ. Among the plants in the beds are *Gentiana algida, G. acaulis* and *G. andrewsii* along with delightful clumps of *Aethionema grandiflorum, Iris gracilipes*, sundry anemones and the spectacular *Erysimum kotschyanum*. Contrasting color is provided by leontopodium, spreading *Potentilla* cv. 'Red Ace,' clumps of miniature *Iberis sempervirens* and a few artemisias such as *A. genipi* and *A. stelleriana*. The period of color is extended by the bright yellow of *Doronicum columnae cordifolia* at one end of the season and the very attractive fall foliage of *Polygonum* 'Border Jewel' and *Viburnum opulus nana* at the other. So far I have not introduced many bulbous subjects but that is another project for the future. Most of the plants are only in their second season but growth has been more than adequate, with subjects like *Silene compacta, Veronica pectinata* and even *Aquilegia saximontana* having to be thinned considerably. Trial plants for this elevation include various codonopsis, *Edraianthus serbicus, Armeria welwitschii* var. *stenophylla, Potentilla megalantha, Dianthus gracilis* and several globularias.

On a fifteen degree slope, overlaying the granite rock and facing almost due west, the scree bank contains a greater selection of plants such as *Celmisia* "uniflora?", *Saxifraga retusa* var. *angustana, S. caespitosa* ssp. *subgenitera, S.*



Primula halleri growing under rock ledge

paniculata var. *minutissima, Draba olympica, Erinus alpinus* and a number of androsaces including the pretty *A. sempervivoides*. As this area of the garden was built in a flurry of a few weeks due to the impending visit by the local chapter of the ARGS, only one season's growth has taken place and it is too soon to see large decorative plants, but *Edraianthus dalmaticus, E. serbicus, Anthemis biebersteinia, Arabis turrita, Kernera saxatilis, Papaver kluanense* and *Armeria pseudarmeria* are flourishing. Watering in the scree is usually restricted to every third day (partly due to cost), but enough is applied each time to soak down to bed rock. Top growth may appear to be limited, but roots are more than adequate. Top dressing with a mulch of granite chips helps conserve moisture and also provides the drainage needed to prevent any problems of water build-up.

It will be interesting to see in future years what happens to the celmisia and mazus from Australasia after such an open season as this year's (1980 – '81) and how finicky plants such as daphnes will survive. But, no matter, if necessary I can always revert back to those attractive natives growing hereabout such as *Allium cernuum, Clematis hirsutissima, Anemone mutifida* ssp. *globosa, Sedum lanceolatum, Potentilla fissa, Harbouria trachypleura* and *Mertensia lanceolata*. Perhaps using the best of two worlds, I can hope for a continuing happy combination. §

Bluff City Cemetery Fen

Rufino Osorio
Chicago, Illinois

In 1963, the Illinois legislature passed laws designed to preserve natural areas. As a result, Illinois has become a "nationally recognized leader in the field of natural areas preservation." As of 1978, eleven areas in Cook County have been formally dedicated and are legally protected while an additional eleven areas are under investigation. One of the areas which is not yet dedicated but is under investigation for Nature Preserve status lies in the extreme northwest corner of Cook County on the border between Cook and Kane counties, adjacent to the Bluff City Cemetery near Elgin. This area is characterized by hilly topography and contains a diverse and interesting flora.

The most interesting geological feature of this site is its fen, "a type of wet prairie with an alkaline water source. Fens are associated with calcareous springs and seeps and also occur in swales and on low ground in areas of calcareous ground water."[1] Other interesting geological and botanical features include a marl flat, a dry hill prairie and a limestone barren.

The Bluff City Cemetery has a series of winding paths up and down several hills which patrons may use to arrive at the graves of their loves ones and which nature lovers can use to arrive at the entrance of the fen. However, the experienced naturalist will forsake the asphalt paths and proceed to the fen by following the border between cemetery on one side and rocky woodland on the other. The going can get quite steep and is fairly tiring to unexercised muscles, but this is the preferred path since there is always something of interest blooming in the woodlands. In spring, *Podophyllum peltatum, Polemonium reptans, Geranium maculatum* and *Fragaria virginiana* fairly carpet the ground. In the very sunniest spots along the edge, and sometimes in the mowed lawn of the cemetery, one can find the very attractive and cheerful *Potentilla argentea*. Its flowers make up for their small size by their clear bright yellow color, while the green leaves sport a coat of white wool on their undersides. This European introduction to our flora grows in the Pyrenees, Alps, and Apennines at a maximum elevation of 2150 meters[2] and Bernard E. Harkness classifies it as a rock garden plant.[3] It is surprising to see it growing here as a rare lawn weed.

At the height of summer, one can find *Phlox paniculata*, an introduction from further south, growing among *Silene stellata* and *Physostegia virginiana v. speciosa*. This is a very pleasing combination. The solid pink *Phlox* flowers act as a perfect foil for the delicately incised white flowers of the *Silene* and the curiously shaped rosy *Physostegia*. In earliest autumn, the *Podophyllum* sets its queer yellow fruits, their taste vaguely reminiscent of some tropical fruit, and in oak clearings the sun sparkles through the large yellow flowers of the semiparasitic False Foxglove, *Gerardia grandiflora v. pulchra* which, in their extravagant color and waxy texture, also remind one of the tropics.

Beyond the woods is the fen proper. One must be careful walking here for it is drained by many small streams of cool alkaline waters and the ground is always moist, as if there had been a recent rain

shower. The sides of the streams are home for *Angelica atropurpurea, Caltha palustris, Impatiens capensis* and *Symplocarpus foetidus.* The *Angelica* is very striking, growing six to eight feet in height and its leaves are decorated with the umbellifer loving caterpillars of swallowtail butterflies. On drier ground, the following plants grow: *Aster umbellatus, Solidago ohiensis, Lilium michiganense, L. philadelphicum, Lithospermum canescens, Dodecatheon meadia, Sisyrinchium albidum, Hypoxis hirsuta, Liatris spicata* and the Chicago region's most common orchid, *Spiranthes cernua.*

The most attractive part of the fen is the marl flat, a sandy area at the base of a bluff where the underground stream rises up to the surface producing a half inch layer of water over the sand. This "sand" is composed of pulverized fossilized shells. Although called both a marl or tufa flat, the phrase "alkaline bog" would also be an appropriate name.

In and around this area are *Potentilla fruticosa* heaths. The plants are of great age with thick gnarled procumbent branches, rich brown bark exfoliating in long thin strips and many bright yellow flowers. The plants growing here are the true native form and differ from the European cultivars frequently seen in gardens. The following add to the tapestry of textures and colors: *Lobelia kalmii, Gentiana crinita, Tofieldia glutinosa, Parnassia glauca, Chelone glabra, Valeriana ciliaris, Pedicularis lanceolata, Habenaria hyperborea, Calopogon tuberosus, Pogonia ophioglossoides* and *Cypripedium candidum.* In little pools there grows a minute yellow flowered *Utricularia.*

The queen of all the plants growing here is surely *Cypripedium candidum*, the White Ladyslipper. It is particularly abundant on bluffs surrounding the marl flat. In late May, the large clumps may send up as many as fifteen blossoms with pure white pouches tinged rose and accented with greenish-brown sepals. A delightful perfume serves as a finishing touch. Her majesty is accompanied by such typical prairie plants as *Lithospermum canescens, Smilacina stellata, Phlox pilosa* and *Sisyrinchium albidum.* Since its associates are all easily grown, it seems reasonable to assume that this orchid would not be very difficult in cultivation. Sheviak states that, "[It] is confined strictly to open sites in full sun or occasionally the light shade of herbaceous vegetation. This species has the highest light requirements of any of our *Cypripedium* species, a reasonable characteristic of a true prairie plant. Usually occupying mesic to wet-mesic prairie, an occasional plant may occur in wetter sites, and I have seen a few plants on a dry-mesic hillside."[4] The above indicates that if readers should come across plants whose habitat is threatened with development, they should grow the plants in a rich, but well drained, organic soil with a slightly alkaline pH in bright light. Although the bluffs where this plant grows in the fen become dry in the summer, one should not risk cultivated plants, therefore it would be wise to maintain even moisture at all times.

Although orchids are considered extremely difficult to grow under artificial conditions, recent field work and ecological studies indicate that some species are remarkably adaptable and may occur in widely varying habitats. Such traits are the hallmark of the more easily grown garden plants. The ecology of *Calopogon tuberosus* suggests that it may be such an orchid. Not only does it occur in the very stable parts of the fen, it is also growing with great vigor in a large patch of burned over *Potentilla fruticosa* heath. It was quite shocking to find its bright pink flowers studding the scorched and blackened ground accompanied only by

the sprouting bases of a few surviving *Potentilla*. The following data, extracted once again from Sheviak, certainly does not seem to fit the description of a fickle, fastidious and difficult plant: "In wet-mesic sand prairie and stabilized disturbed sandy sites, *C. tuberosus* is often common and occasionally occurs by the thousands. [It] is markedly tolerant of drier sites and can occasionally be found on sandy ridges much above the bulk of a colony. *Calopogon* is similarly tolerant of submergence during spring, and abnormally wet seasons do not normally harm it." Since it is found in bogs growing in pure sphagnum as well as in calcareous fens and swales, pH does not appear to be as critical a factor as does adequate sunlight, even moisture and freedom from competition.

Another plant of possible interest to rock gardeners that grows in this fen is *Tofieldia glutinosa*. Although this liliaceous plant with its oval head of white flowers and slender grass-like leaves is found on the calcareous muck of the marl flat in full sun with several sedges, it reaches its greatest vigor on tiny islands composed of decayed leaves mixed with the marl. These little islands are held together by the roots of the plants growing on them and they are covered by a carpet of mosses, fine grasses and sedges. Since water seeps up from below, they are continuously moist and evaporation keeps them cool. Growing with *Tofieldia* in this microhabitat are such plants as *Triglochin palustre, Parnassia glauca, Lobelia kalmii, Solidago uliginosis, Juncus brachycephalus* and *Habenaria hyperborea*. The above should give some indication as to how to proceed in cultivation. Experiments have shown that the seed of *Tofieldia* germinates readily after being kept for two or three months in the refrigerator in a pot of moist calcareous soil. The seedlings, however, are mere wisps of green thread and are easily lost to decay if too wet and to dessication if allowed to dry out for even an instant.

As mentioned above, *Tofieldia* grows in the company of *Lobelia kalmii*, a charming plant which has been mostly ignored by the horticultural world. Since it is usually an annual, and at best a very short lived perennial, rock gardeners tend to be indifferent towards it. However, a brief description follows and individual readers may decide for themselves as to its suitability in their garden or alpine house. In the Chicago area, this plant is found in stable moist alkaline habitats such as wet interdunal flats along Lake Michigan, fens and moist ground along alkaline streams. Thus, the plant is an ecologic indicator of natural undisturbed areas. Although growing in several habitats, it is always found in full sun. The leaves are a deep green and have a glossy surface, the largest ones rarely reaching a full centimeter in length. Since the plant branches from the base, it forms loose mats. However, the leaves are too distantly spaced and the stems too long for it to form the "green carpet" so beloved by rock gardeners. In late summer and early autumn, each stem produces a raceme of blue to purple flowers on wiry pedicels. The zygomorphic blossoms are typical of the genus, but in this case they possess a disproportionately large apron-like lip which seems too big when compared to the rest of the flower. From a distance, the small leaves and thin stems blend into the background and the inflorescence, with its large lipped flowers, takes on the aspect of a mass of blue butterflies dancing in the sunlight. Although growing to two feet, the plants in this fen are rarely over six inches and a few depauperate specimens are only an inch or so high with two or three flowers.

References

1. R.H. Mohlenbrock, *Guide to the Vascular Flora of Illinois*, 1975.
2. A. Huxley, *Mountain Flowers*, 1972.
3. B.E. Harkness, *The Seedlist Handbook*, 2nd ed., 1976.
4. C.J. Sheviak, *An Introduction to the Ecology of the Illinois Orchidaceae*, 1974. §

In Praise of *Viola corsica*

Dr. Alexej B. Borkovec
Silver Spring, Maryland
Photograph by Joseph J. Higgins

Also known as *V. bertolonii corsica*, this outstanding violet provides a spectacular display in the semishady part of the rock garden from March until July and sporadically from then on until frost. I know of no other alpine that can equal it in this regard. Crinkled, dark green, lanceolate leaves grow on decumbent, branching stems. Leafless flower stems rise above the foliage but the entire plant seldom exceeds 15 cm (6 inches) in height with up to ten 4 – 6 cm (1½ to 2½ inches) wide, pansy-like flowers of rich violet with black and white markings on three of the five petals. The throat is bright yellow. New buds are abundantly and continuously produced for three to four months. The tufts do not spread but seed pods are formed for a long period not only from the regular flowers but also from petal-less flowers on shorter stems produced at the base of the plant. Self-sowing is considerable but the seedlings or even mature plants are easy to pull out without disturbing other plants.

Viola corsica

No special soil is required but plants growing in deep shade do not bloom well and those exposed to too much sun rapidly wilt and die during hot weather. They tolerate drought but moisture is needed for continuous flowering. Although the plants are perennial and evergreen, few persist longer than a year.

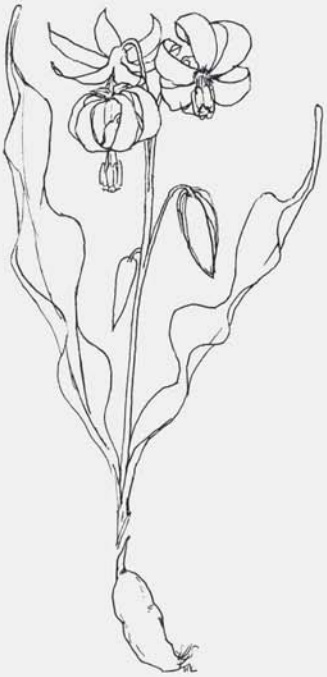
Seed germinates readily almost anywhere but because the seedlings are very fragile and brittle, transplanting must be done with care. The easiest method is to scatter the seed where the plants are to grow and to thin the seedlings when they appear. However, once the plants are established no further propagation is necessary. §

THE SANDSTONE BARRENS OF UNCOMPAGHRE PLATEAU

PANAYOTI CALLAS
Denver Botanic Gardens
Denver, Colorado
Drawings by the author

The Uncompaghre Plateau (pronounced Un-come-*pah*-gree) is not for everyone. This remote tableland in western Colorado is difficult of access, rugged and large. Numerous erstwhile roads wind up its many canyons, roads which are quagmires when cloudbursts pass and powder factories when dry. Few fastidious car owners would permit their cars to be tortured by the mountain's rocks and potholes. Since the plateau has no permanent streams or lakes, fishermen avoid it. Only during the hunting season does this region boast much of a population. At other times of the year almost the only visitors are ranchers, loggers and curious naturalists. The mesa lacks that certain something necessary for touristic appeal. True, the many canyons carved into its sides are just as dramatic as more famous canyonlands, and the top possesses as many melting vistas and dramatic outcrops as most any other hill in the West. And yet, the lack of any overstated features and facilities have helped to keep this mountain from any exploitation by tourism. There are virtually no conveniences along the seventy miles of the plateau except for a few meagre campgrounds. Why would anyone want to visit this place, anyway?

Few people do, and this is certainly part of the Uncompaghre's charm. Although the top of this long and broad mountain is almost as flat as a lumpy pancake, there is a tremendous variety of rock types and vegetation on its slopes. Granite can be found along the western base of the Uncompaghre, along the Dolores River. A number of formations of sandstone comprise the bulk of the mountain. The summit is not nearly high enough for true alpines, but there are a number of patches of subalpine forest on the top and dense spruce-fir forest in the higher reaches of most canyons descending from the rim. The Hudsonian forest here is unusually floriferous once the winter snow begins to melt in early May. The mesic forest floor is a thick woven carpet of *Claytonia lanceolata, Thlaspi montanum,* many *Ranunculi, Erythronium grandiflorum* and the endemic *Mertensia fusiformis.* This last mentioned furry leaved bluebell is one of the finest plants on the mountain. Although it occurs over much of the higher reaches of the Navajo desert, it is especially common on the Uncompaghre. Here it can be found in practically every ecotone above the desert: you can find it in running freshets, in the densest Gambel Oak copses, under aspen, among spruce, growing with cacti on barren rock, and in almost any meadow on the mountain. Its large cluster of semi-tuberous roots and furry stems and deep-blue leaves are unmistakable. This is one of the loveliest mertensias in the West. It is also one of the most amenable bluebells for cultivation, needing only a scree soil in full sun to thrive.



Erythronium grandiflorum

However lovely the subalpine woods, the real appeal of the Uncompaghre lies elsewhere. For the rock gardener, the dry tableland that stretches endlessly over most of the top must constitute one of the grandest natural rock gardens in America. Most of the top is composed of exposed sandstone bedrock that is sometimes gouged into deep ravines and whimsical outcrops. In the southern, more hilly portions of the plateau there are greater accumulations of soil and fine forests of Ponderosa Pine and aspen predominate. But on more exposed sites the Uncompaghre is an uninterrupted series of outcrops and bedrock basins. Little snow accumulates on these exposed slopes, despite the two-mile altitude, and the barrens literally burst into bloom with the first warm spells of late May. By mid-July the top is dry and sere except where a little seepage animates some grasses with a little green color. In the short two months of verdure, the barrens are covered with a rich and floriferous mixture of montane and low-country rock plants in exuberant profusion.

In wet years, such as the summers of 1979 or 1980, *Delphinium nelsoni* is ridiculously common. All the barrens are covered with bright pools of cobalt larkspurs which are the color of twilit skies. The color is intensified by the proximity of dwarf crimson paintbrushes, which are nearly as abundant. *Lithophragma parviflora* adds a patriotic white note to the predominating red and blue: it is prevalent on drier soils, while *Lithophragma bulbifera* occurs in moister spots with its smaller, pinker flowers. Over forty other species of wildflowers can be found blooming at the same time on these barrens. *Townsendia glabella* is one of the loveliest of these. It resembles the common, prairie Easter Daisy (*T. excapa*) except that its lax rosette is greener, and the flowers somewhat larger and more clearly purple. It demands shallow soils on the Uncompaghre, but responds well to cultivation under ordinary, scree conditions in a warm exposure. Here it is far longer lived than its Eastern Slope equivalent.

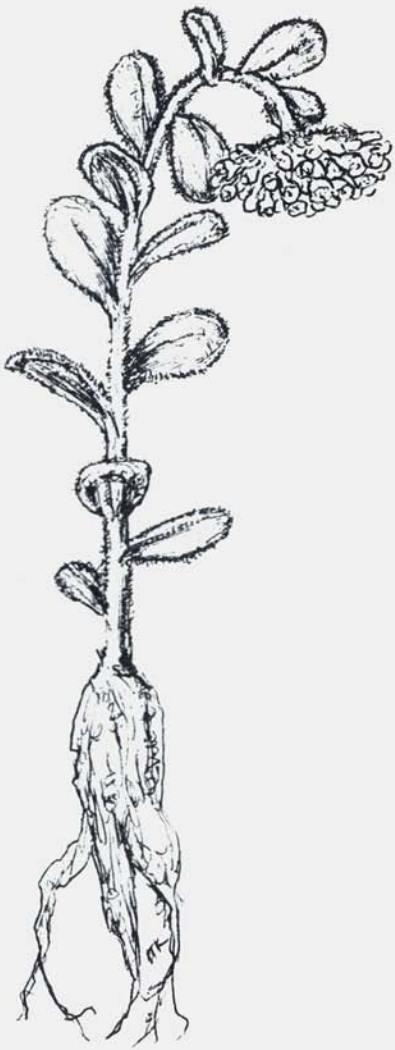
Townsendia incana can be found on almost any dry exposure from the desert up, but generally blooms much later over its tiny, grey rosettes. Furry-leaved bluebells are everywhere, often growing with *Fritillaria atropurpurea*, which only grows where there are no cattle. In the aspen and oak woods the Leopard Fritillary can grow two feet tall with five or more dark bells. On the barrens it is minute with flowers of a brighter, brassier color. Little colonies are not rare, but extremely inconspicuous until you are practically stepping on them.

The Mountain Ball Cactus is especially abundant here. *Pediocactus simpsonii* is so thick on the rocks that it is hard to walk without crushing plants underfoot. The form on the Uncompaghre is much less

brightly colored than the Eastern Slope subspecies. The flowers are smaller and generally white or dirty pink, but the stems grow to a tremendous size. Even at this lofty elevation, plants ten inches across are not impossible to find. Many are the size of hefty grapefruit. Nearby you are sure to find *Penstemon procumbens*, forming extensive mats resembling a dusty heather. By late June, they are studded with many gentian blue tubular flowers. *Phlox longifolia* is the predominant phlox of the mesa, as it is over much of this region. *Zygadenus elegans* has nodding buds in many areas; arenarias, cerastiums and many astragali and oxytropis are here and there.

It is hard to describe the quiet ecstasy one experiences here after a few minutes' walk, but every rock gardener has experienced something comparable. There is always a gentle wind up on the plateau, and the sun is usually intense. Everyone in the party tends to drift off in different directions. But pretty soon someone calls out: "Come here, quick, what in the heck is this?" You gingerly perform a sort of complicated ballet over the lichened, selaginella-studded bedrock, trying to crush as little as possible en route, seeing at least five new flowers on your way. A dozen different composites are already coming into bloom, eriogonums in dense mats, large colonies of *Allium acuminatum* showing the first purple-magenta tint, and the bright purple leaves of *Sedum lanceolatum* that have yet to take on their summer green. This last is so abundant over the entire mesa that the ground takes on a purple color from its rosettes. Down in a moister hollow you can see the lush foliage of Blue Columbine and lupines developing. *Clematis hirsutissima* is opening its first blooms. But you constantly find yourself coming back up onto the bedrock gardens. After a while, you find somewhere to sit down and just look.

To the east the Grand Mesa looms some fifty miles away across the arid Gunnison Valley. In June the lakes are still thawing all over its flat top, dark with forests. Even in June it must be full of fishermen and flowers. Hill after hill stretches out towards the north, towards



Mertensia fusiformis

the distant White River Plateau and its volcanic cliffs. The Manti La Sal mountains in Utah to the west are always evident, blue and ridiculously near. Only now and then do you catch glimpses of the San Juan Mountains, since these are usually masked by hillier portions of the plateau. Mount Sneffels is the nearest of the crags, standing at the head of the long valley to the south.

Most of the time you are looking downward toward your feet, however, no matter how wonderful the views. As you wander a little off the bedrock into a copse of oak and scattered pines you might encounter one of the easternmost colonies of manzanita. Manzanitas were responsible for my first discovering this area. Paul Maslin had collected a small layer of Green's Manzanita (*Arctostaphylos patula*) many years ago. This had become a giant mound clambering over the rocks in his front yard. This plant was beginning to grow rather old and rangy, and Paul decided to return and look for other interesting clones that might be worthy of introduction. The plants on the Uncompaghre are remarkable for several reasons. At over nine thousand feet, these are some of the hardiest clones of this rather mild-climate genus. The patches where the thickest colonies occur are in an area where giant Ponderosas are being lumbered — so there is a special urgency for searching out desirable clones, since the operations are not exactly fastidious. Perhaps because this station is rather remote from the center of distribution of manzanitas, the plants are especially variable and interesting. All variations can be found from prostrate Kinnikinick (*A. uva-ursi*) to foot high mats of *Arctostaphylos nevadensis* var. *coloradensis*, to yard high mounds of *A. patula*. After the disastrous drouth of the winter of 1976-1977, almost three-quarters of the plants on the mesa showed severe damage. Most seemed to have been killed outright. Paul wanted to see what plants might have survived undamaged, since these would hold the greatest promise of enduring the sunny, dry winters along the Colorado Front Range.

We found a number of plants in exposed sites that showed no evidence of damage. These were carefully marked and rocks were placed on stems to make layerings. We returned on several occasions to compare the plants we had marked for bloom and berry color. Four clones were selected for superior qualities on all counts, numerous cuttings have been made and are now established as plants in a number of local gardens for testing. This really is another story, which is still unfolding.

What struck us this year, barely three summers following the drouth, is the total absence of dead plants. Although every bit of growth on most manzanitas on the Uncompaghre had formerly seemed dead, there are as many plants as ever, and these are uniformly green and healthy. Only the relative lack of flowers and fruits on many plants would lead you to suspect that something had happened.

As you wander through the high chaparral of this mountain, with dozens of distinctive manzanitas on every side, through dense mats of bearberry and flowery meadows, another aspect of this mercurial plateau begins to show up. Only the occasional splashes of blue paint on the largest Ponderosas bring ominous thoughts to one's mind. Suddenly the slope steepens, the undergrowth thickens and aspen appear. You are on the verge of a miniature canyon. Scrambling down through vaccinium and manzanita, spruce and fir suddenly close around you and a dark north slope appears opposite. Pyrolas, Pipsissewa and linnaea show dark foliage near a still extensive snow bank. Arnicas are al-

ready starting into growth and a few calypsos are blooming. *Aquilegia elegantula* is quite common on this slope and in this area this dainty cousin of *A. formosa* and *A. canadensis* tends to have a tinge of green on the attenuated red sepals. The woods are surprisingly lush considering how harsh the sandstone barrens and chaparral are over the brink of the hill.

As you wander back onto the top, you notice a herd of cattle; these creatures are the commonest visitors in this region. When camping on this lonely plateau, be aware that the local cows are lonely too. If you like to sleep in the open (and the stars up here are worth it) don't be surprised if you wake up amidst the giant silhouettes of mythic aurochs. At least one rock gardener is reported to have been seen leaping and screaming across the top of the Uncompaghre on a moonlit night.

As you come down off the mountain, you have many more surprises in store for you. The roads westward are steep and less varied in their vegetation, but to the east the roads are gentle and neatly transect all of the major ecological zones of western Colorado. As you descend from the Hudsonian forest in the upper canyons you begin to see more aspen, Douglas Fir, Ponderosa Pine, trees all typical of the Montane Zone throughout the Rocky Mountains. Gradually, Gambel's Oak begins to predominate along the southern slopes along with a thick company of shrubs: purshia, Utah Serviceberry, artemisias, Mountain Mahogany. On steep cliffs cowania, philadelphus, holodiscus and Evergreen Mountain Mahogany form gnarled forests. Gigantic rosettes of *Yucca baccata*, sometimes five feet across, occur on the granite cliffs.

This chaparral predominates for many miles, until a number of junipers start to creep in. Pinon Pines are suddenly everywhere and the typical southwestern Pygmy Forest, seemingly planted by some demented Japanese gardener, prevails over most of the lower reaches of the mountain. Meadows of scant Blue Grama Grass are filled with a hundred sorts of composites, astragali and penstemons. *Calochortus nuttallii* opens its creamy chalices everywhere you look in late June. *Sphaeralcea coccinea* specializes here, as everywhere else in the West, brightening the road cuts.

Townsendia glabella

The road gradually levels out, the woods grow thinner and thinner. This is the prime territory for cacti on the mountain, rocky outcrops are studded with Claret Cups, sometimes five feet across. Coloradoa, or *Pediocactus mesa-verdae* is encountered, though rarely, in a few canyons. Strange euphorbias and eriogonums abound, together with Singleleaf Ash, broad mounds of Perennial Four O'clock (*Mirabilis multiflora*) a wealth of oenotheras and bewilderingly various dwarf yuccas. A special feature of the Navajoan desert sometimes occurs in this level. Certain cliffs collapse to form broad "concaves" where constant seepage gives rise to rich hanging gardens. These are festooned with the tiny, giant-flowered *Mimulus eastwoodiae* with scarlet blooms in late summer. Below there is a thick growth of *Aquilegia micrantha* with its glossy, sticky, deep-green leaves and tiny, multi-

colored flowers. *Epipactus gigantea* usually forms the next layer with strange chatterbox flowers. *Parnassia parviflora* and a dozen other delicate flowers can be found in the wet, alkaline screes. A few canyons have some of the highest known stations of *Adiantum capillus-veneris* in America.

As you leave a hanging canyon, the heat and sunlight become almost oppressive. You continue to descend and it's easy to ignore the desolate landscape around you as you approach the Gunnison Valley. Don't be too quick in your estimate. Although these flats resemble nothing so much as a furnace floor in the summer, they contain a tremendous variety of flowers in the spring. Wet years bring out large numbers of Sego Lily. *Psilostrophe newberryi*, with frosted leaves and everlasting flowers, forms frequent colonies. Lush mounds of *Gaillardia pinnatifida* are common. Any number of the tiny allium relative *Androstephium caeruleum* grow in dense populations on many bluffs and *Phlox bryoides* is not rare. Occasionally you can find the endangered Barrel Cactus, *Schlerocactus whipplei* on these flats. More often *Echinocereus triglochidiatus* crowns some rocky outcrop. There are countless varieties of daisies and strange legumes. Few visitors notice these flowers since by June they are usually drying up for the year. Even at the height of bloom, many visitors pass these meadows unnoticing.

Rock gardeners, too, seem to insist on racing straight to the heights, neglecting an important fact. The areas in the southern Rockies over ten thousand feet in elevation are largely secure from development, while the lowlands, which are quickly being razed by booming cities, irrigation, strip-mining and overgrazing, are where the overwhelming bulk of the native species occur. The lower you go in the Rockies, the greater the floristic diversity and the larger the number of indigenous, rare and unusual taxa. It is imperative that these areas be studied, known and preserved wherever possible. Rock gardeners can serve a valuable purpose in supporting the preservation of the endangered habitats wherever these are threatened.

As I look over this description of a single mountain in the West, I am a little intimidated: hundreds of similarly rich habitats can be found throughout America; over three hundred mountain ranges occur between the Great Plains and the Sierra Nevada. What is even more intimidating is how many things I have seen on this one vast plateau, yet have omitted mentioning in this article. But despite these omissions, I hope I have managed to convey at least some portion of the magic with which Uncompaghre Plateau has enchanted me on my all too few visits. §

ARGS ANNUAL MEETING

ARGS Annual Meeting in Boulder, Colo. — July 2-4, 1982. Write Division of Conferences and Institutes, University of Colorado, Campus Box 454, Boulder, CO 80310 for registration forms and information.

Some Distinctive Plants Of Japan

ROBERT L. BAKER
Photographs by the author

Although the native flora of Japan is rich in woody and herbaceous species of horticultural value, only certain plants have been selected and developed to a high degree for landscape or display purposes. Plants such as cherry, peony, azalea, camellia, iris, chrysanthemum, and maple are valued as much for their historic and cultural associations as for their horticultural merit. Plants and flowers retain a deep symbolic value even in contemporary Japan where seasonal displays of plastic wisteria or cherry blossoms may be seen decorating street light poles in central Tokyo. There is also a long tradition of public interest in natural history and horticulture, as witnessed by the crowds attending the large bonsai exhibitions in Tokyo and the many regional exhibitions of Satsuki azaleas, morning-glories, and chrysanthemums.

Rock gardening, in the horticultural sense, has not been developed as a specialized type of gardening in Japan, although there is great interest in small-scale plants including many of the rock garden species grown in Europe and America. However, these small plants are usually cultivated as specimens in pots or tray gardens (bonkei) and displayed outdoors on tables or benches. They are rarely planted directly in the garden. In another sense rock gardening is of prime importance in Japan, since rocks are one of the essential elements of Japanese garden design along with water (real or suggested) and plant materials. Rocks are valued for their intrinsic beauty of form and texture and are selected and placed with the greatest care. In contrast to the western tradition of rock gardening, in Japan the rock assumes greater importance than the plants around it. It is not valued primarily as a setting for growing plants.

In fact plant materials are usually quite limited in number in the garden, with emphasis on form and texture rather than bright color. However, certain colorful plants traditionally associated with the seasons are often incorporated in the garden design. In winter and early spring *Prunus mume* flowers and is considered one of the "three friends of winter" along with pine and bamboo. Later spring flowers are the cherry, camellia, iris, peony, and wisteria. Early summer features azaleas — the Satsuki cultivars usually grown in containers — and in late summer the Bush Clover (*Lespedeza*). The maples complete the annual cycle with their autumn display.

A mixed planting of multicolored flowers of many species in the British tradition would be considered tasteless and offensive to the Japanese eye. Flowering plants in the garden, as in ikebana and in the arrangement of foods on the table, are placed so that each may be fully appreciated for its own special characteristics.

Many of the distinctive plants discussed here, if cultivated at all, are grown in pots rather than being incorporated into the permanent landscape design.

Native Woody Species

Actinidia kolomikta is a vigorous climber rather common in northern Japan where it may cover the tops of small trees. It is noted for the variable foliage patterns of silvery-white and

green, some leaves with a sharp transverse demarcation between green and white. From a distance the white color resembles showy flowers. On Mt. Rokko near Kobe we found, growing over *Ilex crenata*, a specimen of *Akebia quinata* which had sepals of a pale creamy-white color. These flowers had much greater ornamental value than the typical dull purple flowers of the species. We never saw this form again either in the wild or in nurseries.

Betula ermanii is one of several white-barked birches of northern Japan. Often growing in pure stands, they are reminiscent of groves of *B. papyrifera* in New England, and remind us of the close similarities which exist between the floras of Japan and eastern North America.

It is interesting to see the typical wild type of *Camellia sasanqua* growing in southern Japan. It is a rather small open tree with single white flowers. The typical wild form of *C. japonica* has single red flowers.

Cycas revoluta is the only cycad native to Japan. It occurs in colonies in southern Kyushu and the Ryukyu Islands where it is collected by nurserymen. In gardens around Kyoto and Tokyo they are protected during the winter by cutting back the foliage and wrapping the stems with decorative rice straw coverings.

A specimen of *Euonymus alatus* growing in a private garden in Kagoshima Prefecture had exceptionally broad corky wings on the stems; it had been collected in the wild.

Helwingia japonica, a shrubby member of the Cornaceae, is of interest for its small greenish flowers which are borne on the midrib of the upper surface of the leaves.

Pinus pumila is a prostrate or low shrub to about eight feet found in mountainous areas. It has a dense habit and attractive glaucous needles in fascicles of five.

Only a few of the many native species of rhododendron can be noted here. We were impressed by a stand of *R. albrechtii* growing in the wild next to *Viburnum plicatum f. tomentosum* and flowering at the same time in early June. In Kyushu we visited an upland meadow-like site where the bright yellow flowering form of *R. japonicum* grew in profusion. The flowers appeared as large and showy as some of the Exbury hybrids. *R. kaempferi* the "torch azalea", is highly variable in flower color and grows throughout most of Japan. We saw impressive colonies of the typical coral-red form on the sunny hillsides of Mt. Sakurajima in Kyushu. *R. metternichii* has leathery evergreen leaves, dark green above and rusty-tomentose below, with pale pink flowers. It was observed in mountainous areas associated with *Pinus pumila, Pieris japonica,* and *Tsuga sieboldii. R. quinquefolium* has attractive white flowers, leaves in whorls of five, and was observed near Nikko as a small tree to about twenty-five feet with exfoliating spongy bark.

Native Herbaceous Species

American horticulturists are always impressed by the large number of native genera common to North America and Japan. For example, a close look at the vegetation on the floor of a forest in Hokkaido reveals *Adiantum, Trillium, Rhus, Hydrangea*, and *Pachysandra. Pachysandra terminalis* in the wild usually grows in a rather scattered fashion and is not seen in the dense stands which are familiar to us in cultivation. In fact it is rarely used at all in Japanese landscaping. About forty species of *Arisaema* occur in Japan. Several of these, such as *A. thunbergii* and *A. urashima*, have a remarkable drooping tail-like appendage to the spadix which may be nearly two feet in length. Perhaps the most or-

namental is *A. sikokianum* with its showy white and dark purple streaked spathe. *Asarum asperum* is one of many Japanese species of *Asarum* with handsome leathery evergreen leaves variably mottled with silver-gray patterns. All are worthy of introduction to gardens for use in shaded areas. Some very ornamental cultivars are highly valued by Japanese specialists who grow them in pots as specimens; their sales price is determined by the number of leaves present.

Only rarely did we see examples of native herbaceous plants put to effective landscape use in the garden. However, in a temple garden near Kyoto we saw a fine specimen of the epiphytic white-flowering *Dendrobium moniliforme* growing on the top of a stone lantern. It had been brought from the adjacent forest to the garden where it provided a naturalistic element of age so desired in the Japanese garden. Once we visited a small flower shop in Tokyo where we were impressed by plants of *Shortia uniflora* which had been grown on a mound-shaped wire frame filled with sphagnum and set in a saucer of water. The showy white flowers and glossy foliage were displayed to their fullest advantage in this way.

Among other attractive native species seen in the wild or observed growing in botanic gardens were the white-flowering form of *Campanula punctata*, several variations of *Dianthus superbus* with decorative fringed petals, the diminutive *Dicentra peregrina*, *Fritillaria thunbergii*, *Gentiana thunbergii*, *Habenaria* (*Pecteilis*) *radiata*, *Hosta longipes*, *Iris laevigata* (flowering with *Rhododendron macrosepalum* at the edge of a pond), *Lysichiton camtschatcense* flowering in early May in an alpine bog, *Primula japonica*, *Pyrola incarnata*, a bronze-leaf form of *Rodgersia podophylla*, *Shortia soldanelloides*, the fern *Struthiopteris niponica* with bronze-purple young fronds, and *Viola dissecta* var.

Dendrobium monile (moniliforme) growing on top of old stone lantern

chaerophylloides f. *eizanensis* with deeply cut leaves and white flowers.

Good labeled collections of native plants may be seen growing at the Mt. Rokko Alpine Botanic Garden near Kobe and at the Takeda Herbal Research Garden in Kyoto. There are several nursery areas where unusual cultivars of woody and herbaceous plants may be seen in abundance. Angyo, a few miles north of Tokyo, is one of the major centers of small specialty nurseries. Similar nurseries are located in or near Ikeda and Yamamoto, south of Osaka.

Cultivated Woody Plants

Although many *Acer palmatum* cultivars are well-known outside of Japan, it is an impressive experience to visit one of the maple nurseries and to see hundreds of cultivars of *A. buergerianum, A. japonicum, A. palmatum*, and other species. These are often sold to collectors who grow them in pots trained as bonsai specimens. Only the wild type of *A. palmatum* with green leaves (and brilliant autumn color) is commonly used as a landscape plant.

Ardisia japonica, a low-growing stoloniferous species with evergreen leaves and red fruit, has great merit as a groundcover. In sheltered sites it is winter-hardy in the Washington, D.C. area. Numerous cultivars with variegated leaves are even more ornamental than the species, both as pot specimens and as landscape plants.

Other woody cultivars with ornamental variegated foliage observed in nurseries included a *Corylopsis* species, *Hamamelis japonica, Parthenocissus tricuspidata* (with pink and white young leaves), pines with varying patterns of gold and green needles including *P. densiflora, P. koraiensis, P. parviflora*, and *P. thunbergii; Sciadopitys verticillata*; a form of *Trachelospermum jasminoides* with many albino shoots; and *Wisteria floribunda* with gold-flecked leaves. Among other notable foliage variations observed were a selection of *Camellia sasanqua* with deep bronze leaves and a

A collection of Japanese asarums

shrubby *Morus* cultivar with deeply crinkled dark green leaves.

Genetic dwarf plants of all types have always been prized by Japanese plantsmen who grow them in pots or plant them in small gardens. Among the most striking of these are the extreme dwarf mutant types of *Nandina domestica*. Plants are very slow-growing, with one or several stems, their leaflets often reduced to a threadlike form. Some have been selected for scarlet/orange winter leaf color. All are grown in glazed pots by collectors. Another genetic dwarf valued as a bonsai specimen is a selection of *Ilex serrata* which bears tiny red berries profusely, making an excellent display after its leaves drop in the autumn. A dwarf form of *Hibiscus syriacus* which produces double pink flowers when only six to eight inches tall is also grown as a pot plant, as are several dwarf selections of *Jasminum nudiflorum* with showy yellow flowers.

A strain of *Ginkgo biloba* noted for the production of pendulous woody growths ("chi-chi") at the base of lower branches of old trees has long been cultivated in China and Japan. There is a selection, which is said to produce the pendulous growths at an early age; it is propagated by grafting for bonsai use. There are several excellent mature specimens in Hibiya Park in Tokyo. In the United States I know of only one tree of this type (in Charleston, S.C.), although I have seen several bonsai specimens bearing well-developed pendulous growths.

In one of the bonsai nurseries in the well-known village of Omiya near Tokyo we saw a beautiful specimen of the white-fruiting form of *Prunus tomentosa* thriving in a bonkei (tray landscape).

Another plant often used in bonsai work is *Pinus thunbergii* 'Corticosa' which develops bark with thick irregular ridges and wings on specimens only five or six years old. On the grounds of the Experiment Station at Kurume are several old plants about five feet high with gnarled trunks supported by props.

Blossom of Asarum yakushimense — 2½ inches across

Cultivated Herbaceous Plants

Perhaps the most famous of the Japanese herbaceous plants cultivated for their showy flowers are chrysanthemums and morning-glories. Both are usually grown and trained in pots under exacting cultural conditions and may be seen displayed at large exhibitions during their flowering season.

Other plants less familiar to us, but well documented in Japanese horticultural literature, are the focus of enthusiastic cults with societies devoted to their culture and exhibition. Such plants include *Rohdea japonica* and *Cymbidium virescens*, both noted for their innumerable handsome foliage variants. These are grown in deep pots with a black or blue glaze for display and to accommodate the long fleshy roots. *Selaginella tamariscina* has many cultivars of value as small-scale compact specimens for pot culture. Many have an aspect somewhat resembling an extreme dwarf *Chamaecyparis obtusa* cultivar in form and texture. Some selections are

especially prized for their orange-red winter color. Another collector's plant is *Psilotum nudum*, whose cultivars exist in a surprising range of stem color and growth habit. Indicative of the interest in such foliage plants is the fact that the society devoted to the cultivars of the palm *Rhapis excelsa* has about 1200 members.

Among the few showy flowering herbaceous plants typically grown in gardens rather than in containers are the lovely cultivars of *Iris kaempferi*. They are grown at the edge of streams and ponds or in specially designed ponds whose water level can be adjusted according to the stage of growth of the plant.

The Japanese admire variegated and non-green foliage in herbaceous plants as well as in woody plants. Some of the best examples observed include: *Bletilla striata* f. *gebina* with white flowers and striped leaves, a *Hemerocallis* cultivar with broad white-striped foliage, *Lilium* (*longiflorum*?) with white-margined leaves often seen in florist shops, numerous cultivars of *Liriope* and *Ophiopogon*, several species of *Polygonum*, and two cultivars of *Polygonatum* with showy white-patterned foliage which are frequently used by florists for foliage with cut flowers. §

Bob Baker, who taught in the Horticulture Department of the University of Maryland, died shortly after completing this article. — *Ed.*

George Schenk's Wild Garden

Roy Davidson
Seattle, Washington

The proprietor of this small, distinguished mail order nursery was self-described in one of its last plant lists as "a hermit who shuffles about harmlessly muttering to plants, dreading human company and admitting no visitors. . . . not (he later apologized) that anything particularly shameful goes on here."

Originally on the grounds of his parents' residence, looking Mount Rainier in the eye from a sandhill to the north of Lake Washington, the Wild Garden nursery could not accommodate multitudes of customers and so it was rigidly kept a strict mail-order operation. Periodically, however, it was open by invitation on social occasions, as later, too, were the several innovative, diverse and delightful gardens that conjoined with his own residence next door. It was a unique nursery in many ways; a lady visitor, ankle deep in alpine flowers, quite seriously asked, "But where is the nursery?" She was, of course, in the midst of it. Just as the garden was the nursery, so also was the nursery the garden, at least in part. The regimen of the one-man plant business —as this essentially was — cannot be disrupted if its continuity is to remain intact, for today may well be the optimum time for increasing certain things, which otherwise may know no tomorrow. (Let George do it: "Plants *want* to propagate.")

The Wild Garden has been closed, its post-box relinquished with no forward-

ing address. Enquiries can only be returned to sender. Its proprietor has retired to a garden he has been building in New Zealand. But for his taste, his skill as grower and propagator, as well as for his writings, all our lives would have been far leaner. The book he produced for Lane Publications (1964) known universally as "George Schenk's Rock Garden Book"[1] is a treasure long out of print in which were expressed very broad interpretations, with convincing clarity and very few rules, just *what* it is all about. Occasional writings elsewhere are equally lucid, informative, and inspirational. Good reading.

In 1960 he staged a one-man plant show for the local rock garden chapter and guests, and in 1967, another, to which members contributed specimen material, open to the public in the Eames Theatre of Pacific Science Center, Seattle.[2] A third notable display, clearly showing his talent for this special sort of stagecraft, was that of ferns for the Interim International Rock Garden Plant Conference on the University of Washington campus in 1976. Of the first he wrote that ". . . the best thing about it was it seemed to generate a lot of happiness all around."

Those of us who know this modest, gentle man do not recognize the crank he would have as his public image. His hospitality, for example, is the boundless fabric of demilegend, from an impromptu barbecue for ten at the end of a long day of garden visitations ("Just give me twenty minutes headstart."), to the ten-hour, ten-course, authentic medieval dinner for forty, personally researched and supervised, three days just in preparation, and complete with period musicians, mead, fanfares, and roasted pea-fowl, all in joyous celebration of spring. ("I like to eat, so I like to cook.")

No one of us will soon forget the Wild Garden plant lists, which gave us so much to anticipate, so much advice, and many a chuckle. *Dicentra* 'Alice Fay' was launched thus: "What a great MOO of a plant . . . . rosy pure bleeding hearts weeping deliciously; those who've always loved the girl — my last public heart-throb, when I was nine — they will understand." "Motives tending to separate landscape gardeners from collector-gardeners are as different as logic and love." "*Zauschneria arizonica* wants heat, a melon-and-magpie climate." "Character in a plant is the sum of its genetic memories." and "Alpine gardening is the study of drama in Nature expressed in plants."

Certain irises were likened in their ample grace to "a meadow-ful of Gabors," while on *Sempervivum arachnoideum* we were admonished, "If you want *minima*, you starve: you want *maxima*, you feed." "The magical charm of these certain plants is that they seem too fragile vessels to hold a thing so eager to escape as life." The birth notice of a preci-small shrubby Potentilla proclaimed, "I am guarding this one with a brace of snapdragons!"

We look forward to further writings and to promised occasional visits, and we all wish him Good Gardening, Down Under. §

---

1. *How to Plan, Establish and Maintain Rock Gardens* was reviewed in ARGS Bulletin, Vol. 23,p.15.
2. The display in the Eames Theatre was described in the *California Horticultural Society Journal* XXVIII, 4.

THE PRAIRIE GARDEN

by J. Robert Smith and Beatrice S. Smith. 1980, University of Wisconsin Press, Madison, Wisconsin, $22.50 hardbound, $9.95 paperback.

This book fills an important gap in gardening literature. We devotees of rock gardening have our own specialized literature; if one has a shady area, numerous books speak of woodland plantings, and shade plants of all descriptions from bulbs to annuals. But the assumption appears to be that if there is a sunny area, it will either be a vegetable garden, perennial border, rock garden or lawn.

Now, I don't like my lawn. Other people's lawns are fine, but mine needs *me* to water, mow, etc. In this book one finds a well written, precise and detailed account of how to provide an alternative. It basically describes the Great Prairie of the Mid-west; however, this should be easily adapted for any locale by using the methods outlined in *The Prairie Garden*.

The authors describe seventy prairie plants — perennial flowering plants for the most part — but also grasses and sedges. Each plant is described, giving growing requirements, period of bloom and what other plants to grow in combination with it. Very detailed propagating techniques, which cover seed stratification, cuttings, and time from propagation until the plant may be set in the garden are also included.

There are many advertisements in garden magazines these days, showing little blond girls in pinafores romping through a meadow of flowers. All you have to do, the copy promises, is scatter their special seed mix on the ground and enjoy. This, unfortunately is a false assumption. *The Prairie Garden* describes the three to four year program necessary to create a self-sustaining sod of prairie forbs and grasses.

The plants included in this book have the same relationship to alpines as Gulliver did to the Lilliputians; however, for an open sunny area, adjacent to a rock garden, as a more naturalistic effort than a lawn, this is the book to read and learn from. — J.G.

ALPINES FOR YOUR GARDEN

PERENNIALS FOR YOUR GARDEN

by Alan Bloom. 1981, Floraprint U.S.A., Chicago, Ill. $14.95 each.

Both books have been revised by the author, to be American versions of his most recent gardening books. The famous English nurseryman, Alan Bloom has written some very good books, such as *Alpines for Trouble-Free Gardening* but neither of these is up to that standard.

The first section of *Alpines for Your Garden* is excellent, with good line drawings and colored photographs to illustrate the how-to improve, drain, and

amend existing soil, and build various types of rock gardens. This should be most helpful to new rock gardeners.

The A – Z list of plants is poorly laid out, however. This reviewer found it difficult to connect the text with the appropriate color photograph. The fern photographs on pages 33 and 36 have no relationship with the species listed and the photograph on page 95 is a misnamed scabiosa. Beginners will fail if they try to plant *Arenaria balearica* among sedums and sempervivums as shown in the photograph on page 18; this may succeed in England, but not in most of the United States.

Perennials for Your Garden has a much better layout and relationship of photographs to text, although the plants listed and illustrated are not always in alphabetical order. Both books have many of the same photographs of plants.

These two books are now in the PHS-ARGS Library for the use of ARGS members. — A.K.

ALPINES '81 — A Scrapbag

SANDRA LADENDORF
Chapel Hill, North Carolina

We visitors from "wilder colonial parts", as propagator Philip Brouse described us, had a wonderful time attending Alpines '81. It wasn't just the show, although that was extensive and breathtaking. It wasn't only the lectures, presented by so many of the "greats" of rock gardening like Bacon, Mathew, Drake, etc. It wasn't even the gardens, great and modest, which ranged from Jack Elliott's charmingly personal statement in a walled alpine garden south of London to Jack Drake's renowned nursery far north in Scotland.

The special joys and memories of this unique trip come from the informal contacts: the serious chat about rare fritillarias with an old friend; the frivolous conversation over the Nottingham dorm dinner table, sharing a bottle of wine with new friends; the bits of plant lore collected and friendships developed during our 2000 miles of bus rides; the unique passions of ardent alpine gardeners from around the world.

I'd like to share with you a few of the bits and pieces of information garnered during our three weeks, plus an occasional personal observation.

If you have time to visit only one great garden on your next trip to England, it's got to be Kew. Whatever your plant favorites, you'll be sure to find them there, among the 50,000 different species.

We were given a flying tour of our speciality areas — and I do mean flying — about fifteen minutes each in the rock garden, the woodland garden, the alpine propagation area and the intriguing new alpine house.

Kew cries for revisiting — the fern collection, the orchids, the perennial gardens, the charming old Victorian glass house, and of course hours, not minutes, to really study the new alpine house and all its features.

• • •

We learned how to produce a perfect alpine house: change the entire display twice a week, as curator John Main does at Wisley. This takes an extensive sup-

port system of cold frames, bulb frames and growing areas, of course, but it's an extraordinary display. Every rare plant was at its peak of bloom.

• • •

Some of us tend to rush — to push our seedlings along. Many plants respond well, but I've been losing saxifrages in the potting-on stage, after good germination. Linc Foster recommends leaving saxes in the same pot for one to one and a half years, until they begin to clump. I shall seed the next pots more sparsely and try to develop patience.

• • •

Calocortus also require patience. Wayne Roderick suggests leaving those seedlings in a deep six inch pot for at least two years.

• • •

If you've ever had problems propagating boggy plants like marsh marigolds, take a leaf from grower Jim Saunders at Longstock Park Water Garden and put a cold frame right in your brook or pond. (He also uses many discarded bath tubs for propagation.)

• • •

Another addition to the want list: *Viburnum burkwoodii*. We wafted into the gardens at Hidcote on its lovely fragrance.

• • •

If you get to Oxford and are as addicted to garden books as I am, be sure to explore the second floor of Blackwell's. You probably will find a rock gardening treasure among the used books there. I bought several, thanks to sage advice from Pat Seymour of the Devonian Botanic Garden in Alberta Canada.

• • •

Cheiranthus were planted exuberantly in private gardens and public parks, often double planted with bulbs. We should grow the wallflowers more here in the States.

• • •

Propagator Peter Hutchinson inserts rhododendron cuttings in his rooting medium without removing the lower leaves.

• • •

Wayne Roderick says his biggest problem with cuttings is fungus and therefore he uses fungicide in his water.

• • •

Brian Hollowell of Kew has never been fond of spiky *Aciphylla subflabellata* since he fell into a clump — fair warning!

• • •

The conference itself was rich with information, including typed sheets listing the slides for all the lectures. One of those pens with built-in light would have been very helpful.

• • •

A special treat to me was Jack Drake discussing "One Man's Loves", which included *Trillium ovatum, Corydalis transylvantica, Primula reidii,* raoulias and cassiopes. He is also fond of *Pulsatilla aurea* from the caucasus and *P. alba* which blooms twice a year. "It's luck to flower *Aquilegia nivalis*, I think", was his comment about that beautiful rarity. He said that he has grown it in semi-scree and in a peaty mix with similar results. "When it's ready, it flowers." He was asked if he covers tropaeolum. "Never!" — and his corner of Scotland can produce frost twelve months a year.

• • •

Dr. Peter Thomson who set up the seed bank at Kew says, "Old seed germinates better than fresh. Many seeds are dormant when shed and gradually lose this dormancy."

Proper storage is important. Thomson's method is to put a one inch layer of silica gel in the bottom of a Tupperware container, cover that with cotton, then place paper packets of seed on the cotton, seal and store at room temperature

for six months.

After six months, he makes a duplicate container, transfers the seeds and then either refrigerates at 2°C (36°F) or freezes at -20°C (-4°F).

• • •

Cv. "Potter's Wheel" is a great form of *Helleborus niger*, according to Brian Mathew. If he finds black spot on any hellebore, he cuts off flowers and leaves and sprays every ten days with Benlate.

• • •

Sir David Scott of Boughton House was an inspiration to all us younger gardeners with creaky knees. At 94, he is out gardening for six hours every day and the two acres of rare plants lovingly developed over forty years display his dedication.

He, ramrod straight, tall and trim, the handsome epitome of an ex-diplomat, and his friendly, vivacious second wife Valerie Finnis, alpine enthusiast, greeted us by handing out labels. "All you experts, label our trillium — and anything else you recognize."

• • •

The easy way to propagate lapagerias, according to Wayne Roderick, is to place long pieces on a bed of sand in a pot. Curl it into a spiral on the sand and pin down with leaves up. Cover stem with sand. After a full year, dig and look for round nodules at each leaf. Then you can cut apart and pot individually. It will take six months to a year for new growth.

• • •

Duncan Lowe is the back-home grower of Himalayans collected by Dr. George Smith in those faroff mountains. They need more winter moisture than Europeans, he said. And it's essential to raise the plants on a collar of stone. He remarked that he is having good results with a crushed tufa and leafmold mix for difficult androsaces.

• • •

Brian Hollowell urges all garden writers to write with more passion. I'll try. He would like to read about failures as well as successes, hates as well as favorites. He'll state to anyone who'll listen that he *hates* flowering crabs. I've often wondered why anyone gives garden space to raoulias.

How about it, shall we all send our editor our pet peeves? §

A Light-Hearted Look at Plant Sales

Norman Singer
South Sandisfield, Massachusetts

A lifetime of work in the performing arts — presenting concerts, opera and ballet, not doing them — has left me cursed with a need to count the audience wherever I am; to fume at the way tickets are sold; to get violent when the microphones aren't properly placed (or spoken into) and to be generally unhappy when things aren't run as they should be — my way, that is. All the above apply, of course, to the times when I go to ARGS events and especially to plant sales (and sometimes plant shows) where I am constantly, and I hope discreetly, readjusting plants and/or the accompanying alphabetical/or show class signs under which plants are grouped, so that the crowded plants have breathing space and the lonely ones some company.

Seedling sales are a special menace where plant placements need repeated rearranging as members flock in and jam their offerings into inadequate spaces. When I was asked to co-chair the next seedling sale, I decided here was my chance to apply rational methods to that madhouse.

It doesn't need much counting to know that letter P with primulas and letter C with campanulas will have to have plenty of space to avoid jostling. But how much is "a lot"? To find out how much, I took Lincoln Foster's *Rock Gardening,* Will Ingwersen's *Manual of Alpine Plants* and Anna Griffith's *Collins Guide to Alpines* and went through page by page counting all the species and varieties — not so straight-forward, as one's eyes frequently caught a reference to a loved or lusted-for plant and reading the descriptions meant losing the count. I averaged the numbers out and found that 56% of the plants listed fall under only four letters: A, C, P and S: the highest number of all being A (16%), the lowest C with 11%. In between were P at 14% and S at 15%.

The interesting fact (to me, who hasn't done such statistical — perhaps better described as arithmetical — research since an incomplete PhD thesis) is that from this 56% grouping of A,C,P,S there is a sharp drop to the next highest numbered category, topped by 5%! There were three such letters followed by two letters with 4% each and five at 3% each. Taking these as a close group meant that these ten letters account for 38% of the plants listed while the remaining letters account for 7% of the number. Q and Y had no alpine plants listed in any of the three books consulted. I know that adds up to 101%, but the rounding off was tricky with letters like X having only .0004 of the total and in danger of being zero-listed thereby killing off *Xerophyllum, asphodeloides* as well as *tenax.*

These then are the percentages of the total number of plants under each letter. Is it not reasonable to expect the same ratio in our garden, alpine houses and at our seedling sales?

A	16%	D	5%	B	2%*
C	11%	E	3%	F	1%
P	14%	G	5%	I	1%
S	15%	H	3%	J	1%
	56%	L	3%	K	1/10%
		M	5%	N	1%
		O	3%	Q	—
		R	3%	U	1/10%
		T	4%	W	4/10%
		V	4%	X	4/100%
			38%	Y	—
				Z	2/10%
					7%

*B was a problem as the only letter accounting for 2% and was alphabetically first in the second column, but I felt so sorry for column three that I decided to include B with them to give them a better claim to some space.

Now all one needs is a ruler to get the square of the table surface *(and a pocket computor – Ed.)* and you're all set. And don't forget to make the letters on the alphabetical signs really big! §

• • •

The garden seems to be the one spot on earth where history does not assert itself, and, no doubt, when Nero was fiddling over the blaze of Rome, there were florists counting the petals on rival roses at Paestum as peacefully and conscientiously as any gardener of today.

— Edmund Gosse

• • • *of Cabbages and Kings* • • •

What do rock gardeners do during the off season — a period of approximately five months here in the Northeast? Mostly we turn back to all those chores we have been neglecting or doing half-heartedly during the gardening season: earning our living, cooking decent meals for the family for a change, painting the kitchen, giving the house a thorough cleaning, building a bookcase for all those horticultural books and periodicals that we have accumulated in cardboard boxes over the past few years. There are, however, some brighter spots: the seed lists arrive, the catalogs from nurseries old and new can be pored over at one's leisure in search of those special plants we crave, Study Weekend, and there is time at last to read and study the literature about those horticultural treasures we have as yet been unable to grow. And, the editor hopes, there will be time to write articles, long or brief, to send in to the Bulletin.

For, as you undoubtedly realize, it is the articles sent in by members of ARGS that fill the pages of the Bulletin: your particular experiences with certain plants; a somewhat different way of treating seeds and seedlings, of striking cuttings; a description of a favorite plant or group of plants that you feel has been neglected in the pages of the Bulletin, accompanied, perhaps, by photographs or sketches and including growing and propagating methods you have found successful. All such topics and many others are of interest to our readers.

You may be a beginner still struggling with the abstruse world of rock gardening and all those Latin names; your account of your labors with rocks and soils, your sorrow over plants that unaccountably fail to thrive and your joy over those that do will bring encouragement to other new comers to rock gardening and nostalgic smiles to the old timers who have toiled over that course before you. You may even receive a friendly note with hints as to how to grow some of those plants which died in your new garden.

You may be reasonably successful in growing some of the more difficult rock garden plants (none of us are experts); your recipe for how you do it will help the neophytes in our ranks and, because not even the most experienced rock gardeners have succeeded in growing all the plants suited to their particular garden, may encourage *them* to try yet again and this time succeed with a plant they had given up as impossible.

Have you visited a lovely garden or a fascinating nursery recently? Our members will be glad to hear about it. Do you have a method of foiling deer, rabbits, mice, voles, slugs or muggs? Pass on the word. Someone will thank you. Have you stumbled on a particularly good combination of plants, either aesthetically pleasing, conducive to the welfare of those planted together or both? Let others know of your happy discovery. You don't have to write like Reginald Farrer or have the expertise of a Joe Elliott to write for the Bulletin, though having the plants you write about correctly named and legibly and properly spelled will save both the editor and your readers a lot of grief.

It takes between ninety and one hundred pages of double spaced typing to fill each issue of the Bulletin, enough words for a short novel every year. Obviously ARGS members must write and keep on writing all kinds of articles if our Bulletin is to keep its reputation as an informative and interesting publication; if, indeed, it is to exist at all.

The editor's job is to fill the pages of the publication for which he is responsible, *not by writing himself*, but by obtaining articles written by others and preparing them, by editing and typing when necessary, for the printer. Frequently the editor has to write queries to the authors asking them to clarify or expand a point they have made. Some articles take several such letters. The editor may also try to obtain suitable photographs or drawings to illustrate an article when these have not been supplied by the author. All this may take several months before the article is ready for publication.

The editor will then choose among the articles available in an attempt to create a varied menu for each issue. Or he may decide to run several articles presenting different facets of the same subject. But to do this he must have a comfortable amount of material from which to choose. Unfortunately, at the present time this editor's file is distressingly thin. There is very little to choose from and, indeed, future issues may be scant quite a few pages for lack of articles with which to fill them. I cannot, obviously, write personal letters to each of you pleading for articles; this, therefore is an open letter to you all. Every editor of every publication dependent on voluntary authors goes through such periods of drought, I know, and many editors resign in despair if the dry spell is too prolonged. I hope I shall not be among them, that I shall soon be deluged with a flood of articles pouring into my mail box.

I wish, also, to include in this open letter my heartfelt thanks to all those who have so generously and with a minimum of prodding, sent in their writings, photographs and drawings. You have made my job much pleasanter than it might have been and from the remarks made to me and the letters I have received as editor, it is obvious that many readers of the Bulletin have enjoyed what you have produced. I hope they have taken the time to write you the fan letters you deserve. We all owe you a debt of gratitude. §

• • •

DIRECTORATE

AMERICAN ROCK GARDEN SOCIETY

President Emeritus
HAROLD EPSTEIN, 5 Forest Court, Larchmont, New York

President ..... ROBERT L. MEANS, 410 Andover St., Georgetown, Mass. 01833
Vice-President ..... MARNIE FLOOK, 1906 Academy Place, Wilmington, Del. 19806
Secretary ..... DONALD M. PEACH, Rte. 1 Box 282, Mena, Ark. 71953
Treasurer ..... FRANCIS H. CABOT, Cold Spring, N.Y. 10516

Directors

Term Expires 1982
Pamela J. Harper — T. Paul Maslin — Quentin C. Schlieder, Jr.

Term Expires 1983
Marvin E. Black — Iza Goroff — Howard W. Pfeifer

Term Expires 1984
Patricia Lou Carson (Mrs. Orel Dale) — Kenneth Love — Dr. Robert McDermott

Director of Seed Exchange
Kenneth Vogel
19795 Excelsior Blvd., Excelsior, Minn. 55331

Director of Slide Collection
Mrs. Lois E. Ecklund
Route #5, River Haven, St. Cloud, Minn. 56301

ARGS-PHS Library Service
Pennsylvania Horticultural Society Library
325 Walnut St., Philadelphia, Pa. 19106

CHAPTER CHAIRMEN

Northwestern ..... MARVIN E. BLACK, 124 N. 181 St., Seattle, WA 98133
Western ..... JACK S. ROMINE, 2065 Walnut Blvd., Walnut Creek, CA 94596
Midwestern ..... AILEEN MCWILLIAM (Acting Chm.), 711 Magnolia St., Mena, AR 71953
Allegheny ..... MARGARET H. WISNER, 338 Kemerer Drive, Greensburg, PA 15601
Potomac Valley ..... LYNN MAKELA, 5408 Yorkshire St., Springfield, VA 22151
Delaware Valley ..... ROXIE E. GEVJAN, 536 Dogwood Place, Newtown Square, PA 19073
New England ..... MRS. ROBERT ALBERTS, Box 35, Old Milford Rd., Amherst, NH 03031
Great Lakes ..... JUDY PEARSON, 5421 Whipple Lake Rd., Clarkston, MI 48016
Wisconsin-Illinois ..... IZA GOROFF, 1976 Church St., East Troy, WI 53120
Columbia-Willamette ..... VIOLA V. SOBOLIK, 2120 Pioneer Rd., Dallas, OR 97338
Connecticut ..... ESTHER LEGEYT BAILEY, 157 Douglas St., Hartford, CT 06114
Long Island ..... JEANETTE STELLMAN, 38 Lister Circle, Northport, NY 11768
Co-Chairman ..... MADELINE PAUTZKE, 25 Gunther Dr., East Northport, NY 11734
Hudson Valley ..... PAUL HALLADIN, 85 Hillcrest Dr., Upper Saddle River, NJ 07458
Minnesota ..... JULIUS WADEKAMPER, 10078 154th Ave., Elk River, MN 55330
Siskiyou ..... RAMONA OSBURN, 1325 Wagon Trail, Jacksonville, OR 97530
Western-No. Carolina ..... JAMES A. COLLINS, Rte. 8, Box 211, Hendersonville, NC 28739
Rocky Mountain ..... ANDREW PIERCE, Denver Botanic Gardens, 909 York St., Denver, CO 80206
Adirondack ..... ELVA C. LINK, Box 211 RD 2, Corinth, NY 12822
Watnong ..... SEGLINDE ANDERSON, P.O. Box 93, Hope, NJ 07844
Ohio Valley ..... HARRY W. BUTLER, Rte. #1, 2521 Penewit Rd., Spring Valley, OH 45370

YOUR ARGS BOOKSTORE

* New items in stock

1. ALPINES OF THE AMERICAS — The Report of the First Interim International Conference, 1976. 327 pp., 20 pp. of color plus black and white photos $15.95
2. THE ALASKA-YUKON WILDFLOWER GUIDE — 217 pp. Color photos by plant family $9.00
3. THE SEEDLIST HANDBOOK — by Bernard Harkness. 3rd ed., 246 pp. Quick reference to seed listings of ARGS, Alpine Garden Society, Scottish R.G. Club. Gives genus, type plant, height, color, origin and horticultural reference $7.50
4. THE GENUS PHLOX — by Edgar T. Wherry. 174 pp. Monograph with photos, line drawings, distribution maps $6.50
5. * ROCK GARDENS — by Wilhelm Schacht. 192 pp. Edited and with introduction by Jim Archibald. 28 pp. of color photos plus line drawings $17.50
6. THE HANDBOOK OF ROCK GARDENING — 77 pp. Published jointly by the ARGS and Brooklyn Botanic Garden. Well illustrated $2.25
7. WHAT'S IN A NAME — 24 pp. An easy explanation of botanical names $2.50
8. * PLANTS OF THE VIRGIN MOUNTAINS — 51 pp. Line drawings and descriptions of plant material of Arizona's Virgin Mountains $2.00
9. * PLANTS OF ROCKY MOUNTAIN NATIONAL PARK — 168 pp. Color photos $6.95
10. * WILDFLOWERS ACROSS THE PRAIRIES — 214 pp. Color photos $8.50
11. * PLANT HUNTING IN NEPAL — by Roy Lancaster. 194 pp. Text and a few illustrations $19.00

Handling and Mailing — $1.00 per 1st book plus 50¢ per additional book

Overseas — $1.50 per 1st book plus 50¢ per additional book

• • • • • • • •

12. * ARGS PRINTS OF LAURA LOUISE FOSTER PEN AND INK DRAWINGS

Set of 12 prints (all different) ..... $21.50 postpaid
Set of 24 prints (all different) ..... $38.00 postpaid
Set of 36 prints (all different) ..... $54.00 postpaid
Set of 36 prints autographed .... $108.00 registered mail ppd.

13. * ARGS NOTE PAPER — 12 cards and envelopes, 4½" × 6½". Each of different rock plant by 7 ARGS members $4.25
14. CUMULATIVE INDEX — Volumes 1 thru 34 ..... 75¢
15. SEEDS — 3 Methods of germinating seeds. Xeroxed from ARGS Bulletins $2.50
16. SEED GERMINATION REPORT — by Dara Emery. Data on selected species $1.50
17. TALLY OF ARGS SEED LIST 1ST CHOICE REQUESTS $4.00
18. TROUGHS — Construction and lists of plant material to use. Xerox $3.50
19. ARGS LAPEL PIN $3.35
20. ARGS SHOULDER PATCH — Washable $2.25

Nos. 12 thru 20 are all postpaid. Overseas add 50¢ to order

• • • • • • • •

21. LIBRARY BINDERS for ARGS Bulletins ..... $4.00 each plus mailing chg

All orders prepaid in U.S. funds. Make checks or money orders payable to "ARGS".

U.S. destinations must show ZIP code. Airmail billed at cost.

22. ARGS BOOKSTORE stocks back issues of our ARGS Bulletin. Inquire about availablity and prices.

• • • • • • • •

ARGS BOOKSTORE WILL BUY BACK ISSUES OF ARGS BULLETINS

Contact for offer. Postage for shipping will be refunded.

ARGS BOOKSTORE: Anita Kistler, 1421 Ship Rd., West Chester, PA 19380