

*Cypripedium acaule*

*Laura Louise Foster*

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# The Bulletin

## Editor Emeritus

DR. EDGAR T. WHERRY, 41 W. Allen Lane, Philadelphia, Pa. 19119

## Editor

H. N. PORTER, 158 Whitfield St., Guilford, Conn. 06437

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# Bulletin of the American Rock Garden Society



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## THE COMPOST PILE

This current, and belated, issue of the *Bulletin* is the last to be produced by the present editor. He has somehow, and for reasons he himself does not understand, found it very difficult to keep the *Bulletin* on schedule. He knows that this has caused considerable difficulties in the orderly management of the Society's affairs and for this he apologizes. Good, however, will surely come out of evil, for the new editor is to be Laura Louise Foster, whose superb drawings have been the glory of the *Bulletin*. The Fosters are clearly the First Family of American rock gardening, and under Mrs. Foster's editing I expect that we will be entering into an exciting new era in horticultural journalism.

By kind permission of the author and of the publisher, Theophrastus Press, we are printing in this issue an adaptation of what will be chapter eight of *Alpines of America* by James MacPhail and Robert Woodward. Readers will, I am sure, look forward even more keenly to the appearance of the book and in the meantime will dream of a trip to the O'Brien bog.

*An amplification and correction from H. Lincoln Foster:*

"The Ruffed Grouse, *Bonasa umbellus* (Linnaeus), otherwise known as the partridge, does indeed eat the fruit of the Partridge Berry, despite my playful doubts expressed in a recent article in your esteemed publication, the *Bulletin* of the American Rock Garden Society.



"This fact was conclusively demonstrated by two very vivid Kodachrome slides taken in 1951 and sent to me last week by William Hamilton, formerly of the Department of Biology of Cornell University, author of the classic *Animals of the Northeastern U.S.*, hunter, fisherman, and currently an active gardener member of ARGS and reader of the *Bulletin*. One slide showed the swollen, unopened crop of a Ruffed Grouse, through whose translucent membrane shone red berries and green stuff. The other slide, elegantly illuminated, displayed the contents of the crop spread out beside the empty, opened crop itself. There were eleven clearly identifiable fruits of *Mitchella repens*, plus some green leaves tentatively identified in the accompanying letter as *Waldsteinia* (?) (my opinion is either strawberry or running cinquefoil) and some other macerated material.

"The proof was positive. No doubt of the identification of the 'two-eyed' red berries, obviously so recently gobbled by the bird that there was no time for the crop to work on them before Bill Hamilton brought him (or her) down.

"His letter suggested that at 74 years of age he gets less far afield in the fall and shoots fewer grouse — but he did say that the autumn crocus had flowered well this year."

*Professor Hamilton puts his knowledge of the ways of beasties to our service on pp. 175-177 below.*

*Mrs. Moira E. Ryan, of 126 Hine Rd., Wainuiomata, New Zealand, writes as follows:*

"Reading of John Watson's problem with his 'Tears of Heaven' *Onosma* which failed to live up to its colour promise when under cultivation (Vol. 34, p. 173) led me to speculate on the sensitivity of the pigments in plants to outside influences.

"We are all familiar with the colour changes in *Hydrangea hortensis* which are related to the pH of the soil. Another well-known effect is the occurrence of heightened pigmentation in autumn roses in some temperate areas. It seems likely that such phenomena are more widespread than is generally realized.

"I was reminded particularly of something I saw in Africa more than 20 years ago. In Kenya there is a beautiful delphinium (*D. macrocentron*) which normally displays the most stunning combination of blue and green shades — really an electric blue. A friend of mine obtained a specimen in flower and transferred it to her garden (we were not ecologically educated in those days, I guess). Imagine her disappointment when it got over the shock of transplanting and flowered again — a dirty violet-purple. We could only suppose that it was reacting to some soil difference, probably a change in pH. Unfortunately the Mau Mau (terrorist) troubles soon afterwards gave us other things to think about and the problem was never investigated.

"It seems there might be an interesting line of research here — particularly in relation to the question of pH sensitivity of blue pigments. I don't have any time at present, but might eventually be able to take it up as a retirement interest.

"In the meantime I would be most interested to know if fellow members have come across any further examples."



## THE PEAT GARDEN

*A. Evans, Edinburgh, Scotland*

*The Connecticut Plantsman Lecture 1977*

As more and more gardeners become involved in growing wild occurring species and begin to appreciate the fascination and interest which develop from studying their own native flora, it is only natural that they will investigate more vigorously the best methods of cultivating those species which are alien to their gardens. No garden has the conditions necessary for growing all the plants of the world which are desirable and it is because this is true, and man yearns to have these attractive plants round him, that gardening flourishes. In a small way he is accepting nature's challenge to provide these conditions, a challenge which if successfully met brings satisfying rewards and although these may not appeal to a more shallow, worldly mind it is certain to bring pleasure and warmth to the soul of the horticultural botanist. Nowhere is this sensation more apparent than in the successful cultivation of dwarf, hardy (a relative word) plants although to achieve this often entails many hours of physical effort, much researching into horticultural literature and even adding a touch of originality in the placing of a plant, the use of special growing media or simply the bringing together of compatible species in such a way that they form happy, comparatively stable plant communities.

There are many examples of growing plants in controlled, associated ways and none is more pronounced nor more absorbing than our own main interest — rock gardening. In that setting we are all artists and here we paint our pictures with the plants of our choice, although readily recognizing that some are more successful at this than others. Here we not only practice plant association but we bring into play another of nature's foils, and the very basic ingredient of our soils, namely rock. We acknowledge the value of rock for its physical properties, too, and how often do we hear "plant it in a crevice between rocks" or "plant it in front of a rock where it will benefit from reflected heat" when listening to fellow members offering advice.

However, I doubt if it can be said that rock gardens provide the conditions necessary to satisfy the needs of all the low growing plants we wish to acquire. In some areas it may be possible to cultivate a larger proportion of alpine species than it is in others, but even in the most favored site there are limitations. It is because there are limitations that different methods of growing plants have developed, the main purpose always being to increase the range of species it is possible to foster within a restricting environment as well as growing them better.

The Peat Garden is one such effort and without doubt it provides the ideal setting for many of the plants we attempt to nurture in the more moist pockets of the rock garden. It provides the natural medium for many members of the Ericaceae, a plant family that can be identified on virtually any sub-arctic or northern heath. Vast tracts of wild country are carpeted by sub-shrubby genera belonging to the Erica family and on close inspection these mats of vegetation will be seen to be composed of well balanced, established, plant communities mostly on peat — that partially decomposed substance we find invaluable in our gardens. Our

object in the peat garden, however, is not to grow only a limited number of species for although cold, uninformed, landscape architects may find this possible, sensitive plantmen wish to see flourish as wide a selection of plants as practicable.

Garden settings are important for they provide framework, background and shelter and these have visual importance in an artificial situation. An evergreen coniferous or ericaceous background would be ideal but where this is not possible inanimate shelter in the form of fences or walls cannot be ignored. But naturally, just as in constructing a rock garden, it is more satisfying to have a planned arrangement. Where a slope is available, particularly a partially shaded one, then use should be made of it. The aim here should be to imitate a natural heathland, one in which water courses have gouged and scoured the surface leaving exposed shallow banks of peat. And it is on and in these banks that we propose planting some of our rarities as well as useful, although not too invasive, colonising species. Furthermore, narrow terraces and gentle slopes may be fashioned, completing our setting; the arrangement of a gentle gradient, with peat faced buttresses, descending from the upper terraces to the lower ones.

The fronts of the bold terraces should be faced with large peat blocks, not the small narrow pieces that are usually available as fuel but large nine inch cubes. I prefer the peat blocks to be cut from the first layer of peat after the top vegetation has been skimmed off. In this should be found the remains of roots and other fibres. If these are laid on a batter, that is to say so that they lean back against the wall of soil thereby presenting a sloping front, then this improves stability. And if these blocks can be transported and placed in position while still wet then the construction will be even more satisfactory as closer contact between the blocks can be achieved. In wetter parts of the country it may be possible to build walls two blocks high, up to 15 or 18 inches, allowing something for a little setting-in at the base, but in drier areas terraces nine inches high may be found to be more practical. As you know, once dry, peat is extremely difficult to re-wet and it is a great disadvantage to allow the blocks to reach this state. The soil mixture on the terraces and slopes should also be extremely peaty and if, when adding peat, it is borne in mind that the aim is to compound a mixture of which peat in granulated form constitutes 50%, then most plants we wish to grow should respond quite happily. Where the existing soil is heavy and retentive of moisture this can be lightened by adding coarse grit or sand. Whether the feature terminates at the edge of a lawn as it does, in part, at Edinburgh, or finishes at the hard edge of a path is irrelevant as this simply means that the front planting may have to be treated differently. Where grass is present, obviously the plants must be confined to the beds and it is therefore advisable to use only slow spreading species at the front. Where a hard surface is involved, plants may be permitted to sprawl out over that surface and in so doing will add casual informality to the site.

Before planting starts, however, it must be recognized that plant maintenance will be constant, for this is not a bedding scheme where the whole bed is ripped out and replanted twice a year, so it is important that means of access to the back areas is possible without having to stand on plants.



I find that small stepping stones set at irregular intervals serve this need and if these are placed by the sides of upright shrubs such as some rhododendrons, they are less conspicuous to casual visitors. What this does ensure is that one always stands on the firm areas when tending plants and in consequence there is less danger of treading on young emerging crowns.

The density of planting and the arrangement of the plants on the site will be governed both by what is possible and what is available but I try to have taller, more woody species filling up the background with ample spaces left for some choice perennials such as lilies, *Nomocharis* and *Meconopsis*. Some plants mentioned may appear too vigorous for the owner of a small peat area, but of course, the garden at Edinburgh is not a particularly small one. Towards the front of the bed the ligneous plants are then less dominant and, although present, are often of a low carpeting nature. Between these and amongst them are found the various microclimates into which we gardeners introduce our treasures. Some plants are extremely tolerant of us and I'm sure flourish despite our efforts rather than because of them, but on the other hand there are many more which would quickly disappear if it were not for the constant, protective attention we give them. And it is while we attend to their needs when dividing and replanting, that additional granulated peat may be dug into the soil to replace that which has now become completely decomposed.

In a moist yet open soil in conditions conducive to growth many plants will respond strongly so it is here that the plantsman must be selective and choose wisely the species and forms he introduces. He must exercise discretion and, apart from those plants which may have a double role to play such as providing shelter in addition to flowers, foliage or fruit, only include those which are known not to be invasive. Nature shows no favors and plants in the wild must be able to compete with each other for space, moisture and light. In the peat garden it is we, the gardeners, who are in control and one of our tasks is to subdue the more boisterous species and at the same time encourage the timid. In this way we are able to retain a satisfactory balance of plants.

Choosing plants for a garden is an exciting experience and here one's imagination can be allowed some scope. Furthermore, our anticipatory eye visualizes a garden of colour and interest and so, despite past experiences which could remind us of battles lost, this ultimate goal must always remain vividly before us.

Doubtlessly rhododendrons will constitute the bulk of the woody species but their selection for size and spread will be governed by the size of the area to be planted. *Kalmias*, *Gaultherias*, *Vacciniums*, *Phyllodoces*, *Cassiope*, *Leucothoes*, *Pernettyas*, *Menziesias*, *Kalmiopsis* and others will add variation. Towards the rear or in the middle of the feature if the peat garden happens to have an island setting *Meconopsis*, lilies, *Streptopus*, *Paris*, primulas, orchids, trilliums etc, may be accommodated and complete the planting there. Within reason these species are able to fend for themselves. On the front terraces and slopes and in the walls themselves the rarer, sometimes difficult but highly desirable plants will find homes and, while to say that primulas, *Arctica*, *Sorbus*, *Chiogenes*, *Epigaea*, *Linnaea*, *Fothergilla*,



Omphalogramma, Orchis, shortias, schizocodons, fritillarias, cassiopes, Corydalis, Rhododhypoxis, gentians, dodecatheons, incarvilleas, Jeffersonia, Ranzania and Sanguinaria illustrate quite clearly the endless scope, Adonis, Arisaema, Bruckenthalia, Bryanthus, Calanthe, Chimaeridium, clintonias, Dienanthe, Galax, Glaucidium, Leiophyllum, Platycodon, Pyrol, Tanakaea, Trientalis and Trochocarpa could make up another selection from nature's cornucopia. I'm certain these lists could be extended until they read like a specialist's catalogue. The choice is certainly wide enough to satisfy the most fastidious of growers but the availability of plants will always play a major role. Today nurserymen can no longer cope with the multifarious needs of the enthusiast and therefore the plantsman must be prepared to help himself. This he can do up to a point but he should also always recognize his debt to generous gardeners who have helped him assemble his collection over the years and in return help others by distributing his surplus plants to experienced growers. I am certain that it is only by operating a free exchange of rarities that some of the difficult species will remain in cultivation.



*Rhododendron keiskii 'Yaku Fairy'*

*I asked Ronald Beckwith, who has gardened in both Old and New England, to suggest ways of adapting the peat garden to American conditions. He was reluctant — it would be like adding notations to the word of God — but nevertheless communicates as follows:*

“Mr. Evans and I discussed at some length a Peat Garden in the context of the somewhat severe climate of the Northeast. One of the great problems in the Eastern part of Britain is the prevention of drying out of the peat blocks, as once they are dry they are most difficult to get soaked again. This could certainly be a problem with us.

“Our really great problem of course is the severe winter. I suggested to Mr. Evans that it might help if we faced the blocks with stone, which would certainly help to prevent the great changes in temperature that we experience. Mr. Evans thought that this might be a way around our problem.

“Another of our problems is, where to obtain peat blocks. In the absence of any known source, perhaps we could make the terraces out of stone and behind the stones incorporate massive amounts of the coarsest grade peat moss that is obtainable. As an afterthought, if you should know of a place where peat is being excavated in your locality, then there is no reason why you should not approach the owner and dig your own.”

*Rock gardeners will, of course, want to consult Mr. Evans's book on the subject. There are also articles in the ARGS Bulletin by Will Ingwerson (Vol. 11, p. 27 and p. 57) and an interesting note by Ralph W. Bennett in Vol. 16, p. 113.*

## PINK MOCCASIN

H. L. Foster, Falls Village, Conn.

One of the most sumptuous and appealing flowers of our native flora is *Cypripedium acaule*, the pink lady's slipper. That it has borne more common names than perhaps any other native plant tells us of its universal allure. The first foreign visitors to these American shores must have been impressed with this pink version of what they knew in Europe as "Venus shoe", the yellow flowered *Cypripedium calceolus*.

Linnaeus created the Latinized name for the genus from "Cypris" — Venus, hence Aphrodite, and "pedilon", the Greek for shoe. Purists may wish to write the genus name "Cypripedilum" with excellent authority. But Linnaeus may have had in mind actually that he was talking of the goddess's foot within the shoe, from the Latin "pes, pedis". Or as he created that great new catalogue of plants the name may have been truncated for convenience of pronunciation. The species name, "acaule", is a Latin adjective meaning stemless. Unlike other species of *Cypripedium* it does not carry its flower at the top of a leafy stem, but produces two basal leaves from the crown, and also from the crown a single leafless peduncle bearing the solitary blossom or rarely two blossoms.

Here in this country where *C. acaule* is found wild over an extensive area it has been christened with a host of colloquial names: pink lady's slipper, stemless lady's slipper, two leaved lady's slipper, dwarf umbil, Noah's Ark, valerian, whippoorwill shoe, squirrel shoe, purple slipper, rose-vein moccasin, hare's lip, brown lady's slipper, old goose, camel's foot, and in Quebec, *sabot de la Vierge*.

This shoe of the Virgin has an interesting distribution. It is found from Newfoundland and Nova Scotia west to Alberta, through the Great Lakes area to Ohio and south along the east coast to Georgia and Alabama. It is not found, for instance, in the Ozarks of Missouri or in our western mountains. Within its defined range it favors a variety of sites, always intensely acid. In the southern part of its distribution it is most commonly in rather dry, sandy locations and in the north in moister, even boggy situations. In the northeastern portion of its extension it frequently produces pure albino forms, rare in other sections. So far as the literature available declares, there are no recognized sub-specific divisions of the species except for the forma *albiflorum*; yet the habitat preferences may coincide with considerable genetic variability; there may even be local races more amenable to cultivation.

Prescriptions for growing this lovely plant in the garden are always tentative and buffered by so many caveats that one may safely conclude that most gardeners and all garden advisors have personally failed to bring this native orchid into cultivation. Usually there is resort to an account of the success of a friend, which on further investigation generally means that the plants introduced were solely as supplements to natural stands already in existence. Or, because the pink lady's slipper has the ability to survive for one, two, or occasionally even three years, though dwindling yearly, for several seasons after transplanting, it is likely that the optimistic gardener has rejoiced and bragged about his success too soon. Such gardeners too often, when faced with their plant's eventual demise, lay the blame



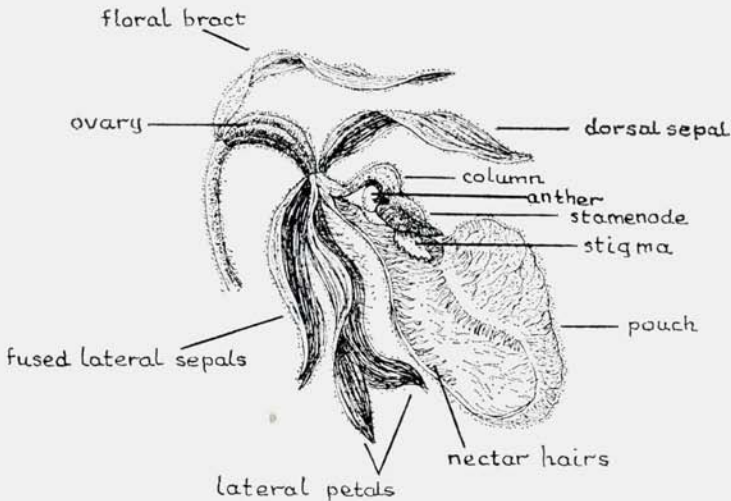
on a mouse or some other accident and again import into their gardens the longed for plant, not realizing that they are condemning it to a lingering death from starvation.

I'm sure a few people have, indeed, succeeded in introducing *C. acaule* into a virgin site by transplanting the plant with a large chunk of its native soil into a situation where the plants would naturally grow, such as a well drained, acid, rather sterile soil beneath an old stand of pine trees. Under such circumstances the micorhizal fungus, so essential for the plant's nourishment would have found a congenial home for its own survival and its symbiotic role with the roots of the *Cypripedium*.

It is important to note, I think, that the fleshy white roots of all *Cypripedium* species splay out from the crown very near the surface. They always inhabit a layer of recently decomposed vegetation, especially well supplied with ambient air.

An established plant will send forth its white spaghetti roots for some distance and develop subsidiary crowns until a colony may eventually carry up to ten stalwart blossoming stalks in a neat clump. Generally, though, the increase is slow and solitary plants may flower year after year without increase, or may even, if conditions are unfavorable, remain underground for a year or more and then reappear to flourish and flower as before, perhaps as their symbiants have regenerated. Injured roots may suffer fungus infection and this may be fatal to a newly transplanted specimen.

It is only fair to say that *Cypripedium acaule*, beautiful as she is, is an untamable Shakespearean Kate. Her reluctance to be tamed must not, however, turn us away from admiration of her essential and intricate beauty and her marvelous devices for fertilization.



The flower of the pink moccasin is composed of several disparate parts. To the tip of the scape is attached the long, curved, heavily ribbed, green, pubescent ovary surmounted by a floral bract that bends down over the top of the blossom partially hiding the capsule and frequently resting on the dorsal sepal that in turn leans over the flower in a graceful curve.



Beneath the pouch are two more sepals, but so fused that they appear to be only one. These sepals are yellow green to greenish brown and more or less marked with maroon striations. The two, long, acuminate lateral petals, more waxy than the sepals and densely clothed with long silky hairs, spring out with a spiral twist from just behind the pouch and are also longitudinally veined with purple, madder and maroon on a yellowish green base.

But it is the third petal of this orchid, the silken pouch formed by the inflated lip, delicately veined with rose and velvety with soft pubescence, be it white, pink, or nearly crimson, that is the cynosure that tempts the gardener. It is also, and more importantly, part of a live-trap for insects, a trap designed to insure cross fertilization.

The inner floor of this pouch is downy with hairs that exude a sweet nectar, the bait that lures the insect in. The entrance is the longitudinal split in the upper surface of the pouch, the edges of which are infolded and fringed on their inner surface with long, stiff, crystalline white hairs. The lips of the split are pressed tightly together throughout most of its length, but at the base of the blossom they part to form an oval opening just under and partially blocked by the over-hanging column made up of the stout curved style of the pistil, which extends at its tip into a broad concave stigma covered on its underside with rigid, sharp, forward pointing papillae which become sticky when the pistil is receptive.

On either side of the column and attached to it at the base are the two stamens with thick white filaments and large yellow anthers protruding out and down into the gaps on either side of the style. These, when ripe, are covered with a mass of granular pollen, called pollonia. Attached to the top of the base of the column is a broadly triangular petal-like sterile stamen, called a stamenoid which expands over the stigma, serving to some extent as an umbrella to shield the sexual parts from the rain. It also acts as a curtain that conceals and partially blocks the opening at the base of the pouch, thus discouraging and even preventing all but very small insects from using it as an entrance into the pouch; in order to reach the nectar hairs most insects must force a passage through the closed lips of the slot.

Once having sipped its fill, however, an insect finds it cannot exit through the same fissure because of the tightly fitting, inrolled edges guarded by the interlaced fringes of hair. Seeking an escape, it is attracted by the light coming through the opening under the column. To reach this exit, however, it must crawl up the narrow throat of the pouch. To do so it must first creep under the protruding stigma, scraping its head and back against the stiff papillae that literally comb off any pollen adhering to its body. Once it has negotiated the narrow passage beyond, it must squeeze through one of the gaps on either side of the column, rubbing against one or the other anther and thus picking up a new load of pollen to carry to the next lady's slipper it visits.

If, by chance, a luckless insect fails to find the partially blocked aperture or is too large to force its way through the narrow tunnel to reach the opening, it is doomed to die, sealed within the luxurious chamber unless, as some do, it can gnaw its way through the side of the pouch to freedom.

Some years very few of the blossoms produce seed capsules. Some authorities think late frosts may damage the flowers just as they mature, preventing fertilization of the ovules, but that cannot be the case in this corner of northwest Connecticut, as we seldom have frosts at the end of May when this plant customarily blooms. It would seem, therefore, that it is more likely a lack in some seasons of the particular insects needed to transfer the pollen from anther to stigma. Those fortunate enough to have *Cypripedium acaule* and wishing to increase their stand can, with the aid of a toothpick or even a handy twig from the forest floor, play the insect's role and thus insure pollination. This is a form of rape and as such is necessarily a bit brutal. Grasp a mature flower firmly by the throat between thumb and middle finger and, with the index finger, lift the stamenoid. Extract the waxy lump of pollen from an anther with the tip of the twig and, seizing a flower on a neighboring plant in the same fashion, scrape the pollen off onto the underside of its stigma after which you can remove its pollinia in turn for further transfer. The flowers are a bit battered after this operation but it is amazing how many fat seed capsules result.

One would like to be able to advise that you may propagate these Venus Shoes by carefully separating the crowns and their intertwining fleshy roots and carefully planting each separation into an appropriate site, as one can with many of the other *Cypripediums*. There are a few who have succeeded in so doing in a stand where the whippoorwill shoe is established. But I do not advise it. Let well enough alone. If you have one or a hundred established *sabots de la Vierge*, be thankful, admire them inordinately, pollinate them as gently as possible, and scatter the seeds with a blessing.



seed capsule

## THE SISKIYOU

*James MacPhail and Robert Woodward, Vancouver, B.C.*

We visit the Siskiyou in southern Oregon and northern California more frequently than any other mountains. Not only is the flora incredibly distinct and suitable but there are many, many sites to investigate. There are also two seasons. The low Siskiyou, with paradoxically the best plants, begin to burgeon towards the end of March, become supreme in April and are fascinating up to the middle of May in a normal season. The high Siskiyou lose their snow in early July and are at their zenith about mid month, seeding by mid-August and thereafter comparatively uninteresting. Few of the Siskiyou plants gain points for habit alone. But they more than make up for it with the flamboyance of their flowers.

The Siskiyou Mountains, which straddle the Oregon-California border, connecting the Cascades and Coast Ranges, are the most northerly of the Klamath Ranges. The Siskiyou are probably older than the Cascades. They are not, however, very high. The sharp ridges are poorly covered with soil; the predominant rocks are mixtures of granite, limestone, serpentine, and other sedimentaries. These mountains are often the northernmost limit of many California plants but also contain a distinct flora of their own. One never knows what may turn up in the Siskiyou.

To begin with the best, almost on the Californian border, in late April we visit O'Brien bog, as it is affectionately known among the *aficionados* the continent over. For sheer concentration of good plants this area of about two miles is impossible to surpass.

Where to look first? — probably at the most ubiquitous plants of the area, the two prostrate *Ceanothus*. They are difficult to tell apart although superficially *C. prostratus* is somewhat larger, more robust, with more toothed foliage, shiny, almost glistening; *C. pumilus* is smaller leaved, round and blunted, with no teeth. Both send up sprays of phosphorescent blue flowers in umbels no higher than about 6" in flower. Incidentally, the iridescence of this blue has been impossible for us to capture on film. It positively glows. The plants achieve a ferocious old age, gnarled, twisted, contorted; indeed the perfect miniature bonsai. One is tempted to transplant these seniors but there is no use. Despite the fact that both species travel by rooting as they go, neither is a willing transplant. Both need to be treated as cuttings until they reestablish. Even then there is an appalling miffiness, both or either dying off with the greatest of ease at any particular moment, mostly because of improper watering. But if they do persist (as one plant of rooted pieces from a tiny-leaved, intricately congested form has for us) give them sun and cold and they bloom. Our best plant for the generosity of bloom was one confined in a pot in the alpine house. Any lesson here? For those afflicted with 'raritis' we once found the 'rare white form' of *Ceanothus pumilus*, which as a contrast to the phosphorescent blues was rather startling.

Our first affection of the O'Brien bog is for the *viola* species. There are four beautiful ones here. Best is minute, cut-leaved, shaggy *Viola hallii* with its pert faces the range of the rainbow all in proportion, unbelievably saucy, altogether a delightful plant. *V. cuneata* is entire-leaved, with almost



equally jubilant flower faces in shades of white and blue. *V. lobata* has heavily lobed foliage, very substantial, with more common yellow flowers. Least interesting of all but still good is *V. praemorsa*, yellow and fairly ordinary. All are rock garden violets (better scree) requiring perfect drainage, full sun, and as they aestivate, very little water from May to the following March.

They are plants deserving of much proselytization. Difficult in the open garden but quite easy as alpine house plants or in covered scree frame, they are too little known. The problem is the slowness of seed to germinate. Indeed, seed is not often available because of the notorious waywardness of timing the capture of viola seed. However, the two great plantsmen of the Siskiyou, Lawrence Crocker and Boyd Kline, who run the Siskiyou Rare Plant Nursery, often collect and distribute seeds of these very precious plants.

There are others of the same ilk. Not found in O'Brien bog but definitely Siskiyou plants are such treasures as *Viola douglasii*, with very large flowers, yellow marked, brown-backed, cutleaf foliage, even lacier than in *V. hallii*: one of the best, one of the trickiest to grow. We grow it best in a bulb frame where it is bone dry all summer and winter. Even better but nearly impossible (we have seen exactly one, count 'em one, cultivated flower) is *V. beckwithii*, with colours in hues of pink and purple, magically large flowers, majestic, with finely dissected foliage. Why it should be more recalcitrant than the others is a mystery. We suspect it is definitely a serpentine plant with the choosiness notorious in this breed. Occasionally also one comes across *V. sheltonii*, which has the usual cut foliage, but whose flowers are smaller, a bit so-so yellow. This is a wide-ranging rock violet, its northernmost station in the Wenatchees near the town of Cle Elum.

There is even one good wet violet in O'Brien bog. (An explanation of the name seems appropriate here: many of the plants in the area are well-moistured from the underground seepage. These do not dry up even in the height of summer. And what a height! We have been collecting seed in 110 degrees in July in this area.) In fact one of the few actual bog plants is *Viola occidentale*, a bit reminiscent of *V. cuneata*, but neither so bold nor so haunting.

The most spectacular of the actual bog plants is of course *Darlingtonia californica*, the cobra plant or pitcher plant. Although many may find its unmitigated ugliness, at least before flowering, an eyesore, for us it exerts a fascination. Those jaded hoods, death traps in fact as this is an insectivorous plant, have an uncommon beauty, we contend, which is much enhanced when the large, fritillary-coloured flowers appear, drooping in stately fashion. Grown in a carefully constructed bog, darlingtonia can be tamed, especially in sphagnum, although it does not always profusely bloom.

Darlingtonia's companion pieces are sometimes the white-pouched small orchid, *Cypripedium californicum*, one of the most amenable of a distinctly testy genus. Plant it shallow in a sphagnum bog or even a peatbed, where it will cosily multiply and almost always bloom. In summer one of the few flowering plants is fat-bugled, tinted *Gentian bisetacea*. Not great but definitely attractive and garden-worthy.

On the adjoining dry flats many fine plants abound. Lewisias flourish in the Siskiyou although at O'Brien the dominant species is the rather maligned *L. oppositifolia*. True it is frail of appearance, even wispy, but such a splendid, if evanescent, white! And when the sun shines it opens up its virginal flowers with a heartwarming dignity. It is a deciduous species, surprisingly wet when blooming but baked hard and dry in summer. Especially prized is a selected dwarf form, about 4" high with rather larger flowers than is usual. There are others of its ilk with the minutest of flowers and, saving that they belong to a noble genus, readily dismissed: *L. nevadensis*, definitely dingy, forked *L. triphylla*, difficult but hardly worth it, *L. pygmaea*, another winsome nothing. Higher up is succulent-foiled *L. leana* and this is such a compact plant it is definitely garden worthy. The flowers are rosy-magenta, small but abundant.

In May the O'Brien flats are aglow with one of the greatest of North American plants, *Silene hookeri*: huge, fringed flowers on a squat plant, in shades of pink to apricot, really superb, very variable. One would be unwise to try it from a collected specimen because of its formidable taproot, but it comes more than readily from seed, often blooming in its first season, and if carefully tended (and marked, since it is all too soon dormant) will be persistent. We have always loved and grown *S. hookeri*, preferring the soft pink forms or those with a *Lewisia-tweedyi* shading. The variety *ingramii* grows more to the north near the town of Roseburg; while it is easier to tame, its colouring is a rather screaming magenta. But with the same huge, fringed flowers on a frail bit of plant, it is certainly not to be overlooked.

Often one sneaks up on a *Silene hookeri* in the O'Brien area only to discover when one reaches it that it is *Phlox speciosa*. The two are not really alike, except very superficially in colouring. This is a very good phlox with needly foliage and large pinky-purplish flowers, often beautifully notched. It is also a most variable phlox species but one that with care and aridity can be grown, at least for a time. Of course, the secret is to keep it summer dry. Of all the versions of *Phlox speciosa* we have seen this is our favorite form. We once found the "rare white" of this too.

Irises of the Californicae section are some of the most useful Siskiyou plants. Here is one of the most garden-worthy: stiff, swordlike foliage, about one foot high, with beautifully pencilled yellow flowers, *Iris bracteata* is a plant every gardener should grow. Basically, these irises are easy to tame although they take a time to adjust to their new surroundings. They are best moved in early spring. There are other species in the Siskiyou including the wide-spread and very variable *Iris tenax*. The best forms are found on Monument Peak. Sometimes this iris can be positively inspiring, in clear shades of sky blue. Usually the colours are more muddied and purplish. Other Siskiyou Californicae irises are: *Iris chrysophylla*, which is about 8" high, with pale yellow or whitish flowers on slender foliage; and *Iris gormanii*, whose bloom can be anything from soft yellow to cream to blue-white with an orange blotch; and *Iris purdyi*, with large creamy flowers. *Iris macrosiphon* has fragrant purplish flowers banded with white and darkly veined; *Iris thompsonii* is not always given specific rank; it is rather like *I. tenax* but much more spectacularly coloured and veined.



Blooming at the same time as the iris is one of our favourite bleeding hearts, *Dicentra oregana*. This is one of the grey-leaved dicentras (similar to *D. nevadensis*) with fat, pouchy flowers in white or whitish-pink. Somehow a tricky plant but one should try it. We have found it needs scree conditions but some shade, not always a habitat easily provided.

In the shaded nooks of the various impressive shrubs, especially *Arctostaphylos manzanita*, with its beautiful peeling bark, one often finds the best of the vancouverias, *V. chrysantha*. These are epimedium relatives (*Berberidaceae*, if you can believe it) with impressive foliage almost always but, only in this species, good-sized and textured flowers, yellow and cheery. And wouldn't you know it: the most difficult to grow. We manage it in peatbeds in less shade than its wild confreres.

On an island in Rough and Ready Creek near O'Brien we find a delightfully hairy, cushiony arabis, *A. purpurescens*, with claret flowers, a little long of stem, but certainly lovely, almost ethereal. Like many crucifers not so long lived as the gardener should like but the cushion alone is a continuous attraction.

And of course there are bluest delphiniums, (*D. decorum*, *D. menziesii*); common spraguea with its pinkish pussy paws; a yellow and smallish *Lithospermum californicum*; various species of berberis, much too confusing for us to sort; *Hesperochiron pumilus*, and many castilleja species.

The most notable family of the bog is *Liliaceae*. From the fringed onion, *Allium falcifolium*, which is purple and everywhere, to the equally common and so much more fringed baby *Calochortus mauveanus*, liliaceous plants hold pride of place, none more so than the most aristocratic of lilies, *L. bolanderi* with its thick whorl of textured leaves and reddish fritillary-like flowers, all on a plant usually a foot high. Truly a great. Alas now rare. But you can grow it from seed, and if you have patience it will be more sturdy and garden-adaptable.

Late in summer the much taller tiger-lily type *L. pardalinum* (or one of its variants such as *L. kelloggii*, or *L. occidentale* or *L. parvum*) will bloom and this is such an easy plant it should not be overlooked for the woodland. Would one could say the same for lateblooming *Calochortus howelli*, with its chartreuse centers muted and mysterious. We have never kept it more than a season. But each time it blooms we are converts anew.

Even less amenable the last great plant of the O'Brien Bog, the August-September fireweed, *Epilobium rigidum*. What a striking plant! — strange, stiff glaucous foliage with out-sized onagraceous flat purple flowers. It grows in very specialized localities, none we know of in cultivation. We leave O'Brien Bog reluctantly.

But the low Siskiyou have a wealth of other plants, some found very near the area. For instance, what could be more enticing than the minute *Trillium rivale*? Usually spotted, dull white, about 6" tall, and altogether one of the most charming of the genus. And such a benefit to the early spring garden. At home it can bloom in February and actually multiply. Of course everyone looks for the special forms, especially the pinks. The best we have was an inadvertent find, collected out of flower: the following spring blooming a rich and fulsome pink.



Although this trillium can grow in full sun one usually finds it nestled among other low level plants, either one of the magnificent erythronium species: lemon-yellow very prolific *E. citrinum*, or richly violet, black-banded *E. hendersonii*, equally generous. The latter is our favorite erythronium and for once this accolade applies to a plant which, given rich humus soil, will thrive beyond your expectations. These are the best of the Siskiyou erythroniums but there are others: of course, the ever-present *E. grandiflorum*, and *E. oregonum* and *E. revolutum*. *E. lowellii*, to the untrained eye, is very similar to *E. citrinum*, and *E. klamathense* is slight, pale yellow in flower, with mottled foliage.

The lowland dodecatheons are confusing taxonomically and not particularly distinguished. *D. hendersonii* in one of its variants is here in multitudes. Higher up grows *D. alpinum*, a useful adjunct in the rock garden and very easily grown but not so 'alpinum' looking as one would hope.

A rather startling Siskiyou plant, although it is too tall for the rock garden, is the stalwart borage, *Cynoglossum grande*. Often over a foot tall and very leafy, it is admissible only in the woodland, but if you can grow it (and this is only possible from seed as it is monstrously tap-rooted) you will appreciate it for the startling clarity of the blue flowers and for their texture, the factor which so surprised us when first we found this plant. We discovered it in lightly wooded areas, often accompanied by the flaming red parasite, *Pedicularis densiflora*, or the "Indian Warrior". Don't bother to do anything but appreciate the latter (unless you happen to be red-colour-blind as one of us is). But in the valley of the Applegate where these two colour-powers grow together it is an awesome sight. It not exactly alpine.

Finally the Siskiyou ginger, *Asarum hartwegii*. We are back to subtleties. If you are a 'cyclamen-leaf-nut' you had better acquire this asarum. Various mottled and silvered with the usual clandestine mousy flowers it is a plant of year-round effect. Once established it will self-sow in your peatbed or woodland border but you never weed out the seedlings. Sometimes you wait to see if you have an especial form. At all times you trundle your spares to the local plant sale, where it is always one of the hits. A plant of taste for the tasteful and very plentiful in the low areas of the Siskiyou, even in the campsites.

The range is noted for the genus *Fritillaria*. Either you're a "frit freak" or you're not. We most avidly are. Indeed almost everyone is when it comes to the fritillary, *F. recurva*, a scarlet wonder. Certainly it is the most immediately impressive of the genus but in the end others inspire more affection. The shape of its petals (recurved, upward turning) is the unique feature as well as the colour and this serves to distinguish it from a much rarer counterpart, *F. gentneri*, usually taller, unrecurved, and less flamboyantly scarlet (the most notorious colour of all is that of *F. recurva* var. *coccinea* but colour distinctions are a mite dangerous as taxonomic differentiations. One always finds special forms). These fritillarias are by no means "plunk-em-in-watch-'em-grow" garden subjects. But in sand, gritty (preferably red sand) mixes, even a sloping bank (which is also a temptation to mauraunders of all sorts, mostly humanoid) they can be grown and will persist if they receive long and hard summer dormancy. Otherwise

they will split into myriad minute bulblets or rice grains and take forever to rebuild to flowering size.

The smaller frits of the Siskiyous include a dwarf, distinctly unique form of *F. lanceolata*, which if one were a splitter, one would saddle with some sort of specific rank. It stays small and has an altogether different presentation from usual *F. lanceolata*, if the term "usual" is possible for such a varied species

But best of all and found in remote and few stations is stunted *Fritillaria glauca* with its greyish foliage and huge wide bells in anything from pure soft yellow to chequered yellows, greens, browns, blues. One of our favorite haunts of this wonderfully stirring little plant is an island in the middle of a creek. The frit does not wander to the shores, where the drainage is unsuitable. Only in the accumulated silt of the island, mostly rocky and sandy, does *F. glauca* survive. When we first found it one of us had to be severely admonished by the photographing other for touching the leaves before the picture was snapped, so farinose is the glaucousness. You can still see the dirty smudge marks on an otherwise beautiful representation of a beautiful plant. *Fritillaria glauca* is considered a difficult plant to grow but this spring at U.B.C. Botanical Garden a beautiful patch bloomed in an open, very sharply drained scree. It was quite a sight!

*Kalmiopsis leachiana* deserves a section all its own. Many know of its strange and late discovery, first by a postman on his farflung rounds, later by a local plants person, a Mrs. Leach, who gave it its genus after some waffling by the botanists who fancied first *Rhododendron*, then more nearly accurately, *Rhodothamnus*, and finally elected a new monotypic genus. Today most of the colonies of this rigorously specialized plant are isolated in mountain fastnesses and require arduous climbs. But one at least (actually others), abuts civilization and can be reached by the shortest of climbs where in late April, usually, draping the rocks, cascading over cliffs, even inhabiting dingiest caves, the pinky-purple flowers flourish their beauty. It is an amazing sight! And yet somehow *kalmiopsis*, which has all the attributes of the true alpine (but is not by any means always found in alpine situations) misses the true glory. The colour is a little too strident, the proportions not exactly absolute. Mind you, when we have seen it in the wild and on more than one occasion on the Show Benches, and even rather often in the garden, it is a plant which stirs many hearts. But not the purest.

There are of course many forms, several colour variations (the truest pinks, i.e. those closest to high mountain forms of the genus *Kalmia* are to our minds the best), differing habits (some root as they creep along, others are upright). The plant is definitely gardenable, although a bit daphnesque in its occasional suicidal bents. We have always grown it in peatbeds (remember its ericaceous heritage) but in nature, although it thrives in duff, it is most often found in rocky outcroppings, often in blazing sun. We often treat pot or trough plants this way and are amazed at their floriferousness.

Although *kalmiopsis* is certainly the rarest and most legendary there are other very special plants, found in only a few stations in the Siskiyous: there is a special form of *Silene hookeri*, sometimes given specific rank

as var. *bolanderi* found in the Northern California part of the Siskiyou, which is surely one of the greatest of all American alpinists. The flowers are huge (almost too much bravura), snowy white, with fringed petals like a parasol. We have had it several times. We no longer do. Either we overwater or we do not permit enough leg room for it to wander. Mr. Carroll MacDonald of Salem, Oregon, who has an absolutely superb miniature garden entitled Wee Plant Haven, grows this plant (which he was party to the discovery of) to perfection in open scree with only a winter cloche for protection. Secret, please, Mac?

There is a special polemonium, *P. chartaceum*, so far known from only one mountain. It is reputedly similar to *P. elegans* but more delicate, more compact, less sticky.

Also very rare is *Phacelia dalsiana*, with white unphacelia-like flowers, large and substantial, even more effective than *P. sericea*.

There is many a calochortus but mostly this is a Californian genus although pink and frightfully rare *C. persistens* grows on serpentine in very localized situations in the Siskiyou. *C. greenei* is not so good (bit too lavender, hairless) nor so rare. Both are large flowered mariposas.

Phloxes are very special and horrendous to separate. The Siskiyou have *P. diffusa* as a common plant, but the best of all is impossibly rare *P. hirsuta*, a shrublet with huge pink flowers and dark centres. None of these plants has much of a hold in cultivation.

The penstemons of the Siskiyou are not a particularly distinguished lot. Most of them are plants of the high Siskiyou where the plants are not so unusual but still certainly attractive. The exceptions are lowland *P. rattanii*, about one foot with lavender flowers in panicles, and shrubby *P. lemmonii*.

The most common, the most sought plant of the highland is *Lewisia cotyledon* and all its variants, either *howelli* (usually pink and striped), *finchii* (really invalid) or *whitei* (not so striped). Somehow in the wild, especially when one is looking for true pink forms or even creamy-bordering-on-yellow forms they are much more exciting than in the garden. Once a true yellow, given the soubriquet "Carroll Watson" was found and it is still in cultivation, at least in the United Kingdom, wouldn't you know it? Somehow, however, the interbreeding which has occurred (and *Lewisias* come almost ridiculously easy from seed) among the garden plants has produced colours of singular garishness, hot roses and simmering purples and farouche apricots. Exciting at first but once you have seen the simple plant with its purity of tone and proportion of flower you much prefer this artlessness to the more than obvious human influence in the various strains now offered. We have never found any rare forms in the wild, not even the rare white one, which is a magnificent garden plant. We keep ours potted as like most albinos it lacks vigour.

Other plants of the high Siskiyou screens include various eriogonums, notably the silvery buns of *E. ovalifolium*, symmetrical and white with often rosy red or yellow or sulphur sprays. Usually the eriogonums are in the same areas as a wonderful scrophulad, *Orthocarpus cuspidatus*, with flowering spikes like miniature blue-purple candles dotting the hillsides. Of course, like the castilleja which is a close relative, orthocarpus is tainted



with the curse of parasitism and not for gardens, Alas!

The most wondrous phlox (and very common even in some lowland stations) is the legendary *Phlox adsurgens*, which usually inhabits shady nooks underneath subalpine shrubs or trees. It is also distinctly variable of form, with pinks, soft or hard, with notched petals (a form discovered by Crocker and Kline, dubbed "Wagon Wheel" is one of the most garden-vigorous), forms with deep and dark centres, and on and on. The simple plant itself is good enough. And of course growable but for how long? We have tried it in peatbeds, in screes with some shade, in ordinary rock garden situations. It almost always survived for awhile and bloomed and thrilled us in April but also almost always too soon petered out. Fortunately *P. adsurgens* is one of the easiest of plants to strike from cuttings (about May) and therefore we have always had it.

The high alpine lupin in the Siskiyou is *Lupinus breweri*, very similar in its silkiness to *Lupinus lyalli* but somehow more compact with usually bluer flower spikes. But just as temperamental.

And an epilobium, not quite so sensational as *E. rigidum* is the Farrer-praised *E. obcordatum*, with shiny, almost glistening, compact foliage (somehow reminiscent of a succulent?) with good-sized purple fireweeds, which must have the sun to open up. I confess I have only once seen at the height of a bright sunny day our scree-frame plant look like anything. Beware of Seed Lists with *E. obcordatum*. Too often one receives a New Zealand species with very small flowers when one orders this plant.

The others are either a touch nondescript or found elsewhere: *Dicentra paucifolia*, *Eriogonum sphaerocephalum*, *Astragalus whitney* var. *siskiyouensis*. There are also interesting lewisia hybrids, chiefly between *L. leana* and *L. cotyledon*.

We could not leave the Siskiyou without mention of the alpine ferns, so useful in garden settings, and one not-so-alpine one, which is, nevertheless, startlingly handsome: the chain-fern, *Woodwardia radicans*, which seems to erupt from rocky outcroppings where there is constant seepage. We planted it in a similar poolside setting in the garden where it was an architectural delight for years until the cold finally got it. Not absolutely hardy.

But the true alpine ferns are, for the most part, much more resilient. *Cheilanthes intertexta* is the local lacefern and for non-botanists indistinguishable from *C. gracillima*; *Pityogramme triangularis*, the goldback, is found here in a more cultivatable form and just as attractive as in the Cascades; the pellaes are all choice with *P. ornithopus*, the bird's nest fern, much more growable than ineffable *P. breweri* which strikes us as the more beautiful. (Because it is more intractable? Who knows?). Look also for: *Botrychium silaiifolium* (to our mind the best of the grape ferns), *Adiantum jordanii* (a dwarf maidenhair), *Pellaea brachyptera* (a truly first class dwarf fern), and the taller coffee fern, *Pellaea andromedaeifolia*.

We leave the Siskiyou reluctantly. (This regret is a much-felt thing when one is plant-hunting). But not for long. Of all the alpine areas we have explored it is the one to which we return most readily, in the expectation of finding something new and something beautiful. We have not been disappointed yet.

## OF MICE, SQUIRRELS AND SLUGS

*W. J. Hamilton Jr., Ithaca, N. Y.*

A great deal has been written on insect pests of the garden and the means by which they may be controlled, but much less has been recorded on the depredations of the more conspicuous animal life. Although substantial damage is incurred throughout the year by mice, rabbits and the squirrel tribe these losses seem to be accepted as inevitable. Not so!

Chipmunks are sociable creatures, and were it not for their pilfering habits, most of us would welcome these little stripers about our homes. It is quite another matter when they commence digging up our crocus corms, leaving nothing but the shredded tunics about the little excavations they dig. Disdaining the big fat Dutch forms, they seem inevitably to select the choice and often expensive species. Control is called for, and this may be effected by the use of large snap-back rat traps or the small sized Havahart trap, which takes the animal alive. The choice of bait is of little consequence. Sunflower or pumpkin seed, a bit of peanut butter or a piece of filbert or walnut meat will do. We have caught 36 of these little stripers in a matter of three months. It is well to place a cardboard carton over the snap traps, open at each end, to minimize the killing of a luckless cardinal or other songster. A .22 caliber rifle, using dust shot shells, effective only up to ten yards, will account for many of these little pests. Campaign against them in late March, before the advent of the first litter.

Gray squirrels appear to delight in digging up small corms and choice tubers, often leaving them untouched. A few years ago a gray squirrel dug up all five of my choice double pink anemonellas, leaving several hundred of the single white native form untouched. The large snap-back rat trap is not quite large enough to handle a grey squirrel. A relatively new and humane trap, known as the Conibear, is particularly effective in their control. The trap takes strong hands and stout wrists to set. Insist on a demonstration of setting the trap before shelling out your money. Dig out a small hole the width of a silver dollar and two or three inches deep. Drop a walnut, acorn or filbert into the hole, and place the set Conibear trap so that the two-pronged wire trigger is directly over the bait. Secure the trap well, for a dog may attempt to drag off the victim. We keep three of these traps set at all times, and in the course of a year 50 or more squirrels are taken. It is true that nature abhors a vacuum, and neighboring stocks constantly invade our grounds. What do we do with the squirrels? Eat them, of course. In early June we put a carcass under a tomato plant as we set it out, and in the course of the summer we pick some fruit that approaches a basketball in size.

If killing these pests goes against the grain, the larger size Havahart trap will prove effective. Do not use the trap size recommended for squirrels, but rather the size that has an 11 by 11 inch opening. This size can then be employed for the capture of squirrel, raccoons, possums and, if you wish, cats. In disposing of the live squirrel, release it five or six miles from your home, for these animals have a well developed homing behavior.



Cottontails are pests of the first order and are often far more abundant in suburban gardens than one might suspect. Close scrutiny of fall and winter blooming crocus will often show cropped leaves, all too often attributed to slugs. It is frustrating to set a Havahart trap with a big red apple (be sure it's red), only to see it stand empty for weeks while telltale tracks in the snow indicate where the rabbit has repeatedly circled the trap. We have met with signal success by stretching a 30 inch roll of chicken wire for several dozen feet in an area frequented by cottontails. Leave an opening just large enough to accommodate the trap midway of the "fence". To remove bunny from the trap, stretch a burlap bag over one end. The creature will eventually enter the bag, from which it can be removed preparatory to roasting. One rabbit can do a great deal of damage in a single night.

Field mice are often major pests to small trees, shrubs, perennials and cormous plants. Occasionally the bark of low growing conifers will be badly girdled. Usually field mice seek cover under dense stands of grasses, pachysandra, myrtle or ground hugging junipers and yews. Their little trails, the width of a garden hose and often cropped bare of vegetation, may be recognized by the little green or black fecal pellets or the match-length stems of cut grasses or herbs. Under cover of snow, they may move into the lawn, leaving telltale castings of cut grasses and crumbled dirt exposed as the snow recedes. Poisoned baits are effective when properly used, and a source for such may be obtained from the county agent. If one objects to the use of poison, these little rodents are easily trapped. Use the smaller sized snap-back traps, placed directly across the mouse runway, so that the trap pan straddles the run. Peanut butter or a nut meat will serve as bait, but a lure is not needed, for *Microtus* is without suspicion and often blunders into an unbaited set. Keep a dozen traps in operation and do not wait for the onset of cold weather. Snow will put an end to mouse trapping.

In these mouse operations, you will unintentionally catch a few shrews, mouse-like animals with tiny eyes and long pointed snouts. Too bad, for these little insectivores are the inveterate predators of the very mice you are warring against. They can, and do, kill mice equal to them in size. Shrews often eat half their own weight in a day. Their delicate subnivean tunnels make fine tracteries in the snow and the elfin tracks, spaced close together, may be mistaken for those of the very mice they devour.

In trapping mice, it is well to place a piece of cardboard over the trap, for a large raindrop striking the pan will spring it. Place the covering sufficiently high so that it will not interfere with the successful operation of the trap.

Easterners should be relieved that they are not plagued with pocket gophers. These fossorial rodents, with great long fore claws admirably adapted for digging and unique fur-lined external cheek pouches, occur in the Great Plains and Pacific Northwest. They are particularly destructive to bulbous plants, and cause great havoc to roots of all kinds. Pocket gophers can readily be caught in specially designed traps that are constructed to fit into the subterranean tunnels they occupy. When the tunnel is opened, the gopher quickly travels to the site to repair the damage and is caught. An experienced trapper can demonstrate the *modus operandi* better than



a page or two of instruction.

A number of mail order houses advertise the traps discussed above. Raw fur houses, advertising in fish and game journals, also offer a wide choice of traps.

Finally, what can we do to reduce our vast population of slugs? They seem always to be with us. Even during mild spells of January, they skeletonize our primulas, while during prolonged wet periods the damage is beyond belief. More has been written about slugs and their control than about any other garden pest. Acid soils seem to be favored over alkaline, but we cannot lime our ericaceous plantings to repel these molluscs. Stale beer, often recommended as a panacea for snails, merely gets staler in my border, eventually drying up. Hand picking after dusk is effective in a measure but truly a tiresome method. If we could only find a food value in the slug, and an appetizing way to prepare it for the table! Perhaps in the far east, some people have added slugs to their dietary, just as the slug's cousin, the snail is favored by so many in other lands. But my one attempt to down a slug ended in near disaster.

Slugs do have natural enemies, and we should give biological control a fling. On our trips afield, we are always on the lookout for the little DeKay's snake, *Storeria dekayi*, or the handsome red-bellied snake, *S. occipitamaculata*. These delightful little reptiles, scarcely larger than a pencil, appear to favor slugs above other food items. Look for them beneath flat stones along shaded road embankments, put them in a sock fastened under one's belt, or knot the sock and slip into a handbag. Liberate them in the garden and they will stay put. To keep them company, and add to slug mortality, bring in such toads as you may come upon. While these amphibians feed principally on ants and beetles, they do not disdain slugs and snails. It is unfortunate that we cannot depend on these useful predators to keep the molluscan population within bounds.

So here is what to do. Gather several plastic lids or trays, soup dishes or any shallow glass pie pans. Now gather smooth flat stones that your assortment of lids and pans will completely cover. Bury the stones so that the top is level with the ground in what you consider good slug habitat. Dab the exposed stone liberally with Slugit (a metaldehyde compound) diluted as recommended. On the center of the stone place nut meats, melon rind, apple cores or any bait you have found to be attractive to slugs. Cover the baited stones with an appropriate cover. The edges of the cover must be propped sufficiently high to allow a half inch space between it and the ground level. Slugs often pass the day under dense cover, such as moss pink, aubretia, thick stands of succulents or low growing conifers. Wetting the ground under such plants with Slugit poured from a sprinkler with a fine rose will also prove fruitful. The sale of Slugit is prohibited in several states, but it is handled by a number of garden supply houses.

One must be forever mindful that these control measures are not a seasonal affair. They must be carried on through all weather and at all seasons. Some of the species we have mentioned are cyclic in nature, their populations fluctuating markedly over a period of years. A useful pamphlet on the control of small animals in homes and gardens is Extension Bulletin 729. It costs 30 cents and may be obtained from the Mailing Room, Bldg. 7, Research Park, Cornell University, Ithaca, New York 14853.

## PIPSISSEWAS AND OTHERS

Milton S. Mulloy, *Waterbury, Conn.*

A legacy from the past is a heavily shaded slope of rich, sandy loam, covered with red pines and our native hemlock, paper birch and beeches. Too closely planted originally and thinned only by attrition, it gets little sun except in early spring and, later in the season along its southerly and westerly edges, throughout the year. There grow some young rhododendrons of various sorts, while on the north mature Norway spruces and, on the east, an old barn gives even heavier shade and shielding from the winter winds.

Many years of unavoidable neglect made this patch home for a vigorous tangle of blackcap raspberries gone wild. Thus shaded they were unproductive and, from the adjacent garden, an unsightly invitation to do something constructive. When inspiration and ambition were in conjunction, the blackcaps came out, and their years-long leaf-litter, with the accumulated pine duff, went into the soil. Thereupon a friend's abundant gift of hosta species and forms made a beginning toward a recognizable shady extension of the abutting, more formal garden, itself too a legacy.

The hostas have thrived, perhaps too well. Some ferns, notably the Interrupted and Japanese Painted (respectively *Osmunda claytoniana* and *Athyrium iseanum* (*goeringianum*) *pictum*) have joined various Dryopteris, the ubiquitous Lady Fern (*A. filix-femina*) and the greedy Hayscented (*Dennstaedtia punctiloba*) to lighten the heavier masses of the hostas and rhododendrons. Elsewhere in this area, at a point where the sun filters through the still-bare branches of the beeches in April, our native hepaticas pay their modest ground rent in return for occasional top-dressings of lime. These and selections of our eastern phloxes (*P. divaricata* and *stolonifera*) give pleasing color in the spring. Nearby that unlikely barberry, *Jeffersonia diphylla* adds its welcome reminder of Ohio friends. Superficially its bloom so closely resembles our bloodroot (*Sanguinria canadensis*) that a novice might be forgiven for thinking the two close kin, until he looks at the leaves of each. Most of these plants have been gifts from friends, and their presence among us serves as a recurring and cherished reminder of many who have thus enriched our lives. Thereby this garden (it is by now beginning to justify the name) serves a gracious double purpose.

With the above as something of a framework, it has more recently become feasible to find places for some of the smaller inhabitants of our eastern woodlands. Not least of all, our trailing arbutus (Mayflower to some — *Epigaea repens*) and the partridge berry (*Mitchella repens*). What New England wild garden could be without these two? Yet, sadly, how seldom are they seen. While these two give every sign of having settled in, I look with less confidence on *Linna borealis*, the twin flower. For three years it has tarried, spread modestly, but never bloomed. Does it miss the *coolth* of its home on the foothills of Mt. Washington whence it came? Is its site too dry? Even, too shaded? What's the remedy? I suspect its next move should be to a site more open to northwest light and altogether moister at the roots. If that fails . . . ?

Of all these quiet woodlanders, perhaps the most engaging because their tolerance of us was least expected, are the pipsissewas and the rattlesnake



plantains (*Chimaphila umbellata*) and *Goodyera* sp. — probably *G. tessellata* or *pubescens*, these being the least uncommon of this by no means common tribe). Like the others above, these seem satisfied here, though the slugs make life a trial for the Goodyeras. Success with *C. umbellata* has invited trial this year of its other eastern relative, *C. maculata*. Three plants got off to a bad start this spring, but with a lot of TLC during the summer give promise now. Today in early October, the status of these “patients” prompts the guarded prognosis that, barring the vagaries of the coming winter, the woodland garden will shortly have added to its roster another of those shy forest plants not often encountered either in the wild or in our gardens.

One cannot properly call these three species great rarities, though they are not readily found. When discovered they may be seen against an otherwise drab forest floor as sure sources of quiet, unassuming substance, dainty to a degree and wholly apposite to their surroundings. Although both the pipsissewas have blooms large enough to invite attention to their pinkish-white selves, the rattlesnake plantains, all of them, need a hand-lens to reveal their undoubted beauty: in these and other of the smaller orchids, there is none of the regal splendor of the *Cypripediums*.

One neither seeks the *Chimaphilas* or the *Goodyeras* for the glory of their blooms, nor does one try to grow them for that reason. Rather, it's the challenge: Can I do it? A valid second reason would be, especially with the *Goodyeras*, the attractiveness of their foliage. That in the pipsissewas tends, admittedly, to be rather sparse and somewhat somber; and for them therefore the *Goodyeras* make a fine foil. These latter in most species offer netted patterns of green and white reticulations of the veins and cross veins that are quite elegant. To the casual observer (perhaps, better say *un-observer*) this variegation gives a generally somewhat greyed effect which is quite misleading and may cause the unwary to dismiss the plant as one of little moment. This is a mistake — the hiker in a hurry misses much. Be that as it may, however, it is quite probable that this very quality of seeming obscure is also a factor in a plant's self-perpetuation. The self-advertising, so to say, of the *Cypripediums* is no doubt in large part the explanation of their near-extinction in our woodlands, assuredly in areas within easy access of urban centers. But no such reason can be adduced to account for the scarcity of the *Goodyeras*, or the *Chimaphilas* for that matter. The causes will have to be sought elsewhere and are not within the scope of this present account.

This wild garden is, over the years, becoming a garden devoted more and more to plants native to the dry mixed forest uplands of New England and to adjacent segments of the country. As such it is still in its beginnings, with many trials to discover what is required to make these shy woodlanders at home, and — with luck — to attain some modest increase such as seems their habit in their native surroundings. From the very nature of the soil, most are plants tolerant of, or requiring, some degree of acidity. Some, like the hepaticas and the jeffersonias, accept our conditions with evident satisfaction; they seem to respond to touches of lime occasionally added. The jeffersonias are indeed now self-sowing. Would that one might say the same for the hepaticas! The pipsissewas and the rattlesnake plantains require no such coddling; but even with it, *Cypripedium calceolus* will



have no part of us whatever. The encouragement gained from our two members of the *Pyrolaceae* suggests that one day we may perhaps succeed modestly with others of its ilk, such as the shinleaf and *Moneses uniflora*, with the bunchberry (*Cornus canadensis*), and others while we continue to dream of cypripediums.

Closely akin to some of the above and mixed among them, are plants of Japanese provenance, some with eastern American affinities, and some without. *Jeffersonia dubia* and *Kirengeshoma palmata* are among the favorites. But it is steadily becoming apparent that, to give the New England natives adequate *lebensraum*, the Japanese plants will have to move over, whereby one day — given luck and perseverance — there may then be a separate area devoted primarily to the Asiatic cousins. But whatever happens, one Japanese plant is not going to be moved: we waited too long for bloom of *Glaucidium palmatum album* to take liberties. We bless it, and walk around it dutifully and respectfully. Shall we at some future date be able to say the like of schizocodons? We are not wholly sanguine, although the seeming establishment of *Shortia galacifolia* and of *Galax aphylla* prompts the hope. And dare we aspire to *Shortia uniflora* . . .? After all, if — after fifty years certain — Indian pipes (*Monotropa uniflora*) can appear where none has ever been seen before, we may perhaps be pardoned if we hope (HOPE, please note, not *expect*) to become favored by still other serendipities.



## BEGINNER'S LUCK

*Barbara van Achterberg, Easton, Connecticut*

I came to have a rock garden three and a half years ago more by reasons of geology than by choice. We had just built our own house on a gravel bank and there was nothing else to do with all the excess gravel from our cellar excavation except to heap it up against the raised foundation of the house. We decided to create a brick terrace with an herb garden on the east side of the house, a wide grass berm on the south side and a rock garden leading to the front door on the west side. After heaping gravel against the foundation and bulldozing it to the approximate contours we wanted, we covered the rock garden rockpile with our carefully saved topsoil. The next day — and the next — it rained, torrentially. When the sun finally came out, our topsoil had vanished. Where our rock garden was to be we had only a heap of gravel piled against the house.

Undaunted we planted whatever came our way, spading a woods soil and a little aged manure from our pigs and chickens with each plant.

Later I observed that there were no real rocks, only pebbles and stones, in our "rock" garden. (The excavation for our house had yielded millions of pebbles, but, unbelievably, only three rocks too large for me to carry alone). A friend offered us boulders of any size. My husband drove his backhoe, and I his pickup truck, to get them. The last and biggest rock went right through the wooden floor of Johan's pickup truck. He managed to drive home, deposited the boulders where I indicated, and retired on the spot from any further involvement with the world of rock gardening. So to this day *my* rock garden consists of five small boulders, whatever smaller rocks I could carry to the site and tons of gravel. To prevent further leaching, I keep the thin topsoil constantly mulched with twigs and ground leaves, delivered gratis in plastic bags by our friend the garbage man.

I will spare my readers most of the horrendous mistakes I have made since that beginning. Nor will I try to discourage from making a rock garden anyone else who might have small children, puppies, kittens, or pigs that are escape artists. Perhaps we need the inner serenity the garden brings us more than most. But I will offer other beginners two bits of advice.

First, if creating a large sunny rock garden from scratch, do consider annuals for quick color and weed control. But know that an annual may be dwarf and still be unsuitable for the rock garden. Petunias, zinnias, double marigolds, nasturtiums and calendulas, no matter how miniature, do not look right in the rock garden. On the other hand, *Nemophila insignis* (for the damper spots), *Alyssum maritimum* and portulaca (for the most sun-baked spots) fit in well. But my favorite is the California Poppy. *Eschscholzia* 'Mission Bells' is so delightful that I am quite willing to have it come up from seed forever. It must have full sun.

My second bit of advice for the beginner is to reject any offering that can't be identified botanically — in Latin, first and second names — unless it is obviously a rare treasure. Snobbery is not the reason, population control is. Two plants which have come my way, first to charm me, then to make my life miserable, have been a large-leaved white violet that blooms in the spring and then multiplies faster than fruit flies on a banana boat and "Dusty Miller," a kind of artemisia that springs up anew from each tiny section of root remaining after its supposed eradication. But the violet is worse; it seeds itself across the driveway, in the vegetable garden — everywhere. If I had known the proper names for these weeds I could have looked them up somewhere to know what lay ahead. Forewarned is forearmed.

Now for the successes: all the common seeds and plants recommended for the beginner have done well for me, as long as they were species that could resist drought. The drainage here would make a gardener in Bowling Green, Ohio, gnash her teeth in envy. The four feet of gravel we piled against the foundation of our house overlie eighteen feet of gravel that have been here since the last Ice Age. Also my rock garden is in full sun. (I have planted small trees to create some shade). Drainage is



no problem, but water retention is. I have had smashing good luck with *Alyssum saxatile*, preferring the pale yellow *A. s. citrinum* so much that I am planning to eliminate the harsher colored basket of gold eventually — except for *compactum* which I hope will cross with the *citrinum* to create a pale yellow compact form. Equally satisfactory are *Saponaria ocyroides*, *Anthemis nobilis*, *Thymus serpyllum*, *Dianthus alpinus alwoodii*, *Iberis sempervirens*, *Gypsophila repens rosea* and *Aquilegia flabellata nana alba* (I love the way that name rolls trippingly off the tongue)! *Achillea tomentosa* “Little Beauty” has lovely foliage and gay golden flowers all summer, but it is a spreader (though not like “Dusty Miller”), so I now restrict it to the hottest driest places, where it stays nice and low. Aubrieta, on the other hand, prefers the coolest moistest spots to the north of some of my five boulders, where it also thrives. *Campanula carpatica* lives but languishes. *Santolina chamaecyparissus* dies back each winter but revives by June. All of these were grown from seed. All get the shredded leaf-and-twig mulch and the lime-lovers get limestone sprinkled around them two or three times a year.

A year ago I joined the A.R.G.S. and have enjoyed the bulletins immensely. It has been good to make the acquaintance of two experienced rock gardeners who have been generous in both advice and cuttings. I have purchased a few plants, *Aethionema* ‘Warley Rose,’ *Artemisia* ‘Silver Mound,’ (Infinitely better behaved than that Dusty Miller), *Daphne cneorum*, *Ceratostigma plumbaginoides*, all of which seem to like it here. A rare treat was the tour of the Fosters’ rock garden in Falls Village. Here I saw, among other wonders, a *Daphne cneorum* twelve feet across — something for me to look forward to in nineteen years! Mr. Foster’s book has been very useful too.

My interest in rock gardening has grown from a strictly practical one — I had that big pile of gravel to landscape — to a love that I expect will be lifelong. I have sent in my first contribution to the seed exchange and am eagerly anticipating the treasures I will get to know and grow in coming years, including some of my early failures, *Dryas octapetala*, saxifrages and primulas among them. I am perhaps proudest of one plant, not rare but not in the lists for beginners either, to which I can seem to do no wrong. This is *Arenaria montana*. I grew my plants from seed in 1975 and they have been growing as handily as any magenta *Phlox subulata* ever since. *Arenaria montana* is not only a true beauty, with its adorable white flowers in May and June, but all I have to do is grow it for a season, break it apart and I have three or four new plants. The legendary winter of 1976-77 did my plants no harm, and the heat wave last July only turned them temporarily brown in the middle. (I did water.) I even planted some of my excess plants along a driveway in front of hybrid rhododendrons. There they are spreading, slowly but happily, in their oak leaf mulch. All they seem to need is some sun, some rain, a light mulch — and eighteen feet of gravel below. Truly, living on a gravel bank gives beginner’s luck to a rock gardener!



G. SEDUM — ITS LIFE AND HABITS

PART 3: NORTH AMERICAN SPECIES (EXCLUDING MEXICO)

R. L. Evans, London, England

When we come to the sedum species of North America, what ought a mere Englishman to say more than, "Ye have Clausen and the other botanists; hear ye them"? The following brief account is, therefore, submitted with proper deference.

On arriving at the Eastern shores we meet again the spatulate flat-leaved forms last encountered in the Caucasus, and these represent a great part of all the U.S.A. species, though their leaves become much fleshier as we go westward.

Along the Appalachians and Alleghenies from N. Georgia to Virginia grow the three Eastern U.S.A. perennials of the "Genuina" type, — *S. nevii* in the southern areas, *S. beyrichianum* (*S. glaucophyllum*, — Clausen) to the north, and *S. ternatum* widely distributed throughout and extending westward to the Cumberland Plateau and north-west as far as Missouri. All have white flowers with narrow-lanceolate petals. *S. ternatum* is easily recognized by its broad, rather obovate, leaves borne in whorls of three. The leaves of the others are smaller and narrower and appear as almost basal rosettes. *S. nevii* is the smaller and more compact of the two. The flowers of all are usually 4-partite — unusual in the genus and representing yet another of those exceptions which make definitions so difficult.

There are two annuals in N.W. Georgia, *SS. pusillum* and *smallii* (or *Diamorpha cymosa*).

Also in the Appalachians is the sole American representative of the telephiums, *S. telephoides*. Praeger says there is little distinction between this and the European *S. telephium*, but *S. telephoides* has whitish (not reddish-purple) flowers. Further, the only specimen I have seen has some decumbent and branching stems — a distinctive feature which Clausen does not appear to mention, and of which as typical of this species I should be most interested to receive confirmation or otherwise. It seems to be a lower and less sturdy plant than *S. telephium*.

One of the most popular species in cultivation is *S. pulchellum*, i.e., "beautiful", which it certainly is, especially in flower. The leaves are unusual among American species in being linear, and of circular section. They are borne in dense tufts along erect or ascending, low-growing, stems, and are of a bright yellowish green. The long-stemmed inflorescence, of 3-5 wide-spreading and recurved branches, is covered with an abundance of light rosy-purple flowers. This is when it is growing well. In winter it dies back almost to the ground, and I have found that if kept as moist as Praeger suggests it is very prone to botrytis and sudden death at that stage. However, small, and more vigorous, plants often appear from offsets. It should be grown outdoors at all times.

The habitat of *S. pulchellum* is in a sort of crescent from N. W. Georgia through southern Illinois to Oklahoma and Texas; and together with that of *S. ternatum* bridges the gap between the Eastern and Western species, keeping to the higher ground.

We next come to the little yellow-flowered annual *S. nuttallianum*, in Missouri; and further west — in the Rockies and the ranges of the far-west States — is quite a profusion of attractive species, a number of which have become popular rock-plants in Western Europe.

Mention must first be made, however, of the Western American form of *S. roseum*, *S. integrifolium*. Why it should have got a red face on entering the New World is a matter of speculation; but there it is with its flowers all red instead of the Old World yellow. It is also rather more green in leaf, and usually with leaves less dentate, than the Old World forms. *S. integrifolium* is dioecious, and the familiar terms "King's Crown" and "Queen's Crown" presumably reflect this feature. In Western America it extends along the mountain ranges from Alaska to Colorado, and thus much further south than anywhere else in the world. In the East it keeps to its usual northerly habitats. As is to be expected, in its wide western range it exhibits many modifications in habit of growth, from the stunted plants of the Arctic to the taller and longer leaved forms of the southern Rockies.

But the species *S. roseum* overall in its extensive circumpolar distribution has so many localized adaptations that to give each variation the title of a subspecies would create almost as many ssp. of *roseum* as there are species of *sedum*. It is true that botanists have tended to do this. But a comparison of the efforts of, say, Berger and Froederstroem will indicate the rather alarming results of their industry.

*S. rhodanthum*, from Montana to Arizona, is the only other American representative of the *rhodias*. This is quite an attractive border plant, upright, leafy and compact, with its white, rose-flushed flowers borne (unusually) in dense racemes. It grows in damp places, by streams and in meadows, and so does not need so well-drained a site as most.

Perhaps the most commonly cultivated Western American species, in Europe as elsewhere, is *S. spathulifolium* in its various ssp. and forms, and so it scarcely needs a description. It comes in two ssp., (1) the glabrous leaved ssp. *anomalum*, with an attractive little variation in var. 'Aureum' whose leaves turn pale yellow in summer and which is not nearly so robust as the type (There is also a horticultural variety 'Carnea', with leaves maintaining throughout most of the year a crimson or vermilion tint.); and (2) ssp. *pruinatum*, with mealy surfaced leaves. This is rather taller and with larger leaves than *anomalum*. From ssp. *pruinatum* comes var. *purpureum*, — a very vigorous grower and useful as a tidy carpeter, for it seems to like any soil and in nature grows down to sea-level. The deservedly most popular form of ssp. *pruinatum* is, of course, 'Capa Blanca', indigenous to Cape Blanca in s. Oregon. This is a scree or trough plant and forms a tight hummock of soft-grey mealy leaves, with heads of bright yellow flowers for long periods in early summer.

*S. spathulifolium* has a wide range of distribution in the coastal and interior ranges from Br. Columbia to northern California, and is to be found in many different habitats, including sea cliffs. This, of course, results in as many different appearances. Any sun-loving plant will grow weak, pale and straggly in shade; and the fact that *S. spathulifolium* looks like this on a north-facing cliff wall or under trees does not mean that it



is a different species or even a different variety. Conversely, in an exposed, windy, arid or hot site it will get stunted and sunburnt. Do not despair if ssp. *purpureum* becomes a dull dark green during a wet winter. It will recover its purple farina next summer.

There are two relatives (or ssp. if you will) of *S. spathulifolium* which are distinctive in producing longish offsets or strawberry-like runners, — *S. purdyi* from the Klamuths and Siskiyou, and *S. yosemitense* from the Sierra Nevada.

Both are prostrate plants with yellow flowers (though *S. purdyi* was once said to have white flowers), but *S. purdyi* is much the more vigorous and densely leaved. Its slender runners, rooting at the tips and producing flat rosettes, are almost hidden in the profusion of glossy mid- or bright-green obovate leaves. These form a low flattish hummock. The plant can increase quite rapidly, once established, and is useful for a raised bed, where, if planted near the edge, it will make a compact clump above and trail over the edge.

*S. yosemitense*, on the other hand, lacks energy — at least in attempted cultivation. It is a smaller plant, with long-obovate and somewhat petiolate flat leaves of a dullish glaucous colour, similar to those of *S. spathulifolium*, in rosettes only about half the size of those of *S. purdyi*; and since its runners are about the same length the general effect in cultivation is of runners straggling around and setting up rosettes at intervals. After flowering it is very much inclined to die out altogether.

*S. oreganum* is almost as well-known as the spathulifoliums. Commonly in the States it is an upright, though low-growing, plant, packed with small, flat glossy green spathulate leaves arranged alternately, the flowers having narrow lanceolate semi-erect bright yellow petals. In Britain the most common, and almost the only known, form cultivated is prostrate, with much smaller leaves strongly flushed reddish or purple. The flowers are as in the type. This is used as a carpeter or in crevices on rockeries, and grows very vigorously. *S. oreganum* is widely distributed (though localized) at fairly low altitudes (to 1,500') from Br. Columbia to southern Oregon, e.g., in the Cascade and Coast Ranges.

*S. divergens* is rather like *S. oreganum*, but there are very distinctive differences. The leaves are orbicular, not spathulate, and arranged in pairs. The petals, as the name implies, are quite divergent, though also of a bright yellow, and wider than those of *S. oreganum*. In its habitat it keeps rather farther north than *S. oreganum*, viz., from the Cascades in central Oregon to Queen Charlotte Island in Br. Columbia, and to higher altitudes (7,500' on Mt. Rainier) and more humid situations. Its variation under different climatic conditions and seasons of the year, even in the same plant, is remarkable. In winter it can die back to small sprigs of tiny dull green leaves which break off and root about. It can become prostrate, with long weak red stems and dark red leaves on elongated internodes. Then in summer, under the right conditions, the stems spring up and become pinnacles, 2" high or more, tightly packed with very fleshy, glossy, bright green leaves many times the size of their winter counterparts, and looking an entirely different plant.

A comparatively recent introduction to cultivation, and now appearing in the British nurseries, are the laxums. These come from S. W. Oregon



and N. W. California, in the vicinity of the Klamuths and Siskiyou. They form fairly substantial hummocks, and in mid-summer produce large heads of pink flowers. The type is ssp. *laxum* (syn. ssp. *perplexum*). Others are ssp. *heckneri* (the best known) and ssp. *latifolium*. All have broad spatulate and "leathery" leaves in lax rosettes on short, stout and rather woody stems. The leaves are of a rather dark, dull glaucous green, sometimes appearing bluish, and the bright pink flowers contrast well with this. These are scree plants.

Allied to these is *S. moranii*, from the Rogue River area of southern Oregon. The leaves are also leathery, and about the same shape, size and colour as those of the laxums, but they develop as open, almost basal rosettes on very short stems at ground level, and the flowers are sulphur yellow.

*S. moranii* and the laxums have petals erect or semi-erect and united at the base, and have (together with *S. oregonense* and *S. obtusatum*, which share the same features) for this reason often been classified in the past by American botanists under a separate genus or sub-genus known as "Gormanian" — though European botanists have been reluctant to follow this example. It now appears, however, that they have finally been admitted into the Honourable Company of Sedums.

*S. oregonense* and *obtusatum*, which both grow in the same regions of the Klamuths and southern Cascades and northern Sierra Nevada, have similar leathery spatulate leaves borne in lax rosettes, but their flowers are (usually) yellow. Both have the distinctive habit of throwing off longish lateral horizontal branches from the main stem. These bear erect terminal rosettes, and eventually arch and root. In the case of *S. obtusatum* these laterals are fleshy and pinkish, and arise nearly at ground level. Those of *S. oregonense* (syn. *S. Watsonii*) are rather stouter, arise higher up the stem, and generally in opposite pairs. A form with this characteristic of *S. oregonense*, very much pronounced, is cultivated in the U.K. under the name *S. rubroglaucum*, a name given by Praeger who described the plant. It also has leaves rather shorter and more orbicular, of a glossy dark green, and markedly stem-clasping. Clausen equates it with *S. obtusatum*, but the habit is more akin to that of *S. oregonense*.

A very interesting and attractive hybrid of *S. laxum heckneri* and *S. spathulifolium* has been collected by Helen Payne at Trinity River in the Siskiyou, where it is probably endemic. This has been called 'Silvermoon', and has the yellow *S. spathulifolium* flowers, with the leathery leaves of *S. heckneri*. The leaves, — in basal rosettes — become obovate and close up into compact spheres in Spring, opening out and elongating in Autumn.

*S. lanceolatum* and *S. stenopetalum* have between them outwitted many writers in the past, including the usually infallible Praeger. Further complications have arisen from the name "*S. douglasii*" being applied to *S. stenopetalum*. There is in fact a very distinctive form of the latter cultivated widely in the U.K. under the name, "*S. douglasii*", the type plant being almost unknown there. This form is altogether a larger and stouter plant, with longer and narrower leaves in erect almost imbricate tufts, and often flushed red or yellowish, — and more "showy" than the type. It remains possible that this was the form which Douglas himself collected and which was given specific status as being so seemingly different from the true *S. stenopetalum*.

Both species are widely distributed along the Rockies from Br. Columbia to Colorado and westwards towards the coastal regions, and thus habitat is no sure guide to identification. When seen together, however, even out of flower, they are fairly easy to distinguish. *S. lanceolatum* has close "tufts" of very fleshy, dull glaucous-green leaves, often flushed red or purple, and upturned at the tips. Those of *S. stenopetalum* are flatter "keeled" dorsally, more openly rosetted and of a clear green. In flower there can be no doubt, for *S. stenopetalum* is viviparous and bears little bulbils along the length of the stem and sometimes in the inflorescences. These leafy bulbils readily drop and root. This is necessarily a brief diagnosis; there are a number of other botanical distinctions. Both are little "tufted" plants, about 1½" high in cultivation with 4" stems of yellow flowers. There are a number of subspecies.

*S. debile* and *S. leibergii* also sometimes seem to be confused in cultivation; though there is here no reason why they should be, since they are so obviously different plants. It is very likely that *S. leibergii* is scarcely in cultivation at all, for it hides itself away in the desert regions of the Columbia Plateau, tucked into moss in rocky crevices along river valleys, and almost disappearing from sight during hibernation. It is a low-growing plant, with long narrow oblanceolate flat leaves, of a dull green, and a "cartwheel" inflorescence of canary-yellow flowers.

*S. debile* is also low-growing, but sports a compact mass of small chubby pale-green or pinkish leaves, much resembling *S. dasyphyllum*, with 3"-4" flowering stems bearing bright yellow flowers in a three — and scorpidly — branched inflorescence. The overall effect is of a tightly packed hummock. *S. debile's* habitat is in open rocky regions of the Colorado Plateau and the Great Basin.

Down to the south a few North Mexican species extend into New Mexico, Texas and Arizona. Amongst these are *SS. wrightii*, *cockerellii* and *griffithsii* (this last apparently still a "doubtful" species). *S. wrightii* in its early and mature growth is a handsome plant, forming a clump or erect stems about 3" densely packed with flattish elliptical glabrous green leaves, and compact in habit. The main roots are thickened; the flowers white, suffused pink at the base, cup-shaped below, spreading above. At flowering time the leaves drop profusely and root, forming next year's offspring. *S. cockerellii* is described as similar to *S. wrightii* but with the leaves arranged in loose basal rosettes and the white petals widely spreading.

*S. niveum*, growing in a rather limited area around the San Bernardino Mts. in southern California, is described as resembling *S. cockerellii*, with prostrate stems bearing rosettes of obovate leaves and with white flowers.

Altogether there are about 25 perennial U.S.A. species. Of annuals there are about 8, some of which can be hived off into separate genera on somewhat academic botanical grounds. There are also closely related genera, eg. *Lenophyllum* (1 species) and *Hasseanthus* (4 or 5 species) which might doubtfully be termed "sedums". The equivocal term "about" has to be used, because a precise number depends upon the particular botanist selected as the authority. There are questions of genus, sub-genus, species, sub-species, varieties, forms and synonyms; and botanists are predictably at variance on these issues.



## GROWING SEMPERVIVUMS IN NORTHERN OHIO

*Paul H. Boswell, Massillon, Ohio*

My first acquaintance with houseleeks came in the way of two gift plants soon after we began gardening in Massillon in 1946. They were large creatures, attaining diameters of three or more inches. Of one there are still progeny in the garden and in the light of present knowledge I would identify it as *Sempervivum tectorum* var. *tectorum* (Linnaeus). The other was a plant of purplish hue, likely the horticultural cultivar known as 'Atroviolaceum' also of *tectorum* kinship.

Some years later I found an advertisement and mailed an order for sempervivums to MacPherson's Gardens, then of Toledo, Ohio, but now the suburb known as Oregon. I received more than a baker's dozen for the twelve plants I ordered and the rosettes were varied and exotic. More years passed and, when Harry Butler called together American Rock Garden Society people of Michigan, Indiana, and Ohio in the prospect of forming a Great Lakes Chapter within the Society, I was pleased to become acquainted with Harold (he prefers to be called Sandy) MacPherson and we became fast friends. From there on I could buy no more plants from him as he always returned my checks saying that my money was no good in Toledo.

Time marched on and at another meeting of the Great Lakes group I became acquainted with Mina Colvin of Nashville, Ind., also a devotee of sempervivums. I bought some of the plants she offered in the auction and presently we began corresponding — a happy arrangement still in effect. After a time she sent me samples of her entire collection excepting the varieties I had already from Sandy, so that my garden was soon overflowing with more than three hundred houseleeks. I studied them and speculated on the probable parentage of the hybrids — an almost hopeless task according to Lloyd Praeger, whose monograph on the genus I had meanwhile obtained from the publisher Sandy had recommended.

A.R.G.S. people have a way of introducing their friends to people of like interests and it was the late Richard Langfelder of Chappaqua who suggested that I ought to know the Bruce Neils of Briarcliff Manor, N.Y., who were interested in sempervivums. I wrote, and another warm friendship developed which I value continually. Mina Colvin, too, knew many of the nation's sempervivum buffs and dealers and after a time we formed a round robin of ten led by Dr. William Nixon, an M.I.T. geneticist and botanist of Randolph, Massachusetts and this group continued until it was replaced by Nixon's *Sempervivum* Fancier's Association Newsletter which we hope will be the forerunner of an American sempervivum society.

Meanwhile I had joined the *Sempervivum* Society of England, which was begun in 1970 and, though a bit late, acquired all of the back issues of the *Journal*. Peter Mitchell, its originator, began offering for mail order sale valid species, forms, varieties, and hybrids and I acquired plants I had hitherto despaired of finding in the trade. I learned that Praeger's twenty-three species had grown to more than half a hundred through explorations in Spain, the Balkans, the Caucasus, and Asia Minor and that many of the rarer plants were being offered to Society members. Moreover we

began to find that many so called species in the trade were not "kosher" — some being bee hybrids of mixed parentage and others simply names originated in scrambled labeling sometime in their past.

As in many genera, specific nomenclature is in a state of flux as more and more sophisticated taxonomic procedures come into play. *S. calcareum* (Jordan), an old favorite and formerly considered a geographical variety of *S. tectorum* now is regarded as a true species. On the other hand *S. giuseppi* (Wale) from the Pina Espiguete in northern Spain is suspected to be a natural hybrid of *S. arachnoideum* (Linnaeus) and *S. cantabricum* (Huber). Many more of the species named since Praeger's book was the last word will be subject to further scrutiny. Some will survive in their present niches and other will be damned as products of miscegenation, splendid garden plants though they may be.

The northeastern U.S. seems to be in a cycle of cold winters with adequate snow cover, which is the true alpine condition, and many of the tribulations concerning sempervivum culture reported by our British cousins have not occurred here. I keep gambling with more and more Balkan and Caucasian species left out to the vagaries of winter weather and so far I have not lost a rosette in well drained locations, whereas some succumbed in the cold frame during the winter of 1975-76 when the cover leaked melting snow water and then re-froze and I had suffered a severe heart attack and could not get out to check up or air the frame. *S. erythraeum* (Velenovsky) from southwest Bulgaria is reputed to need a glass cover through winter in the British Isles, but it seems to relish our conditions and never falters. Its sister plant, *S. ciliosum* (Craib) seems equally at home in our southeast-facing wall and increases by leaps and bounds. We have two geographical forms of this species, the one from Ali Boutsch and the pink tipped one from Mali Hat.

Of the species from Spain — *andreaum* (Wale), *cantabricum* (Huber), *nevadense* (Wale) and, if you will, *giuseppi* (Wale) — all seem to thrive here with no coddling. The Caucasian species I grow are *alturm* (Turill), *borissovae* (Wale), *causicum* (Ruprecht), *ingwersenii* (Wale), *minus* (Turill), *pumilum* (von Bieberstein) and *transcausicum* (Muirhead). From the Balkans, besides *ciliosum* and *erythraeum* just mentioned I have *ballsii* (Wale), *kindingeri* (Adamovic), *kosaninii* (Praeger), *leucanthum* (Panic), *macedonicum* (Praeger), *marmoreum* (Grisebach), *octopodes* (Turill), *reginae-amaliae* (Held et Guic ex Halacsy), *rutheniicum* (Schnitzpahn and Lehmann), *thompsonianum* (Wale) and *zelebori* (Schott). Excepting *S. marmoreum*, which is miffy in the typical form but iron hardy in its varieties, all of these seem to flourish here in cold winters. I may sing a different song if we return to a cycle of open winters with alternate freezing and thawing and soggy rains. Perhaps the Farmer's Almanac or observation of old long range forecasting signs will allow us to resume putting some plants back into the frame in November.

Among the not so well known plants is *S. pittonii* (Schott, Nyman and Kotschy). It is from the eastern Alps. I have had several plants called by that name but all seemed to grow too large to fit the description. I got a plant from Mitchell but there was only one rosette and it flowered. With monocarpic plants that means finis. I would guess the species would adapt well in this climate.



Some natural hybrids I find interesting are *S. christii* Wolf (*grandiflorum* x *montanum*), *S. fauconetti* Reuter (*Arachnoideum* x *tectorum*), *S. fontanae* Brugger (*arachnoideum* x *tectorum glaucum*), *S. funckii* Braun (*arachnoideum* x *montanum*), *S. roseum* Huter (*arachnoideum glabrescens* x *wulfenii*) *S. rubellum* Timbal and Lagrave (*arachnoideum* x *tectorum alpinum*), *S. rupicolum* Kerner (*montanum* x *tectorum* x *wulfenii*), *S. vaccarii* Wilezek (*arachnoideum* x *grandiflorum*), *S. versicolor* Velenovsky (*marmoreum?* x *zelebori*) and *S. widderi* Lehman and Schnitzpahn (*tectorum* x *wulfenii*). *Sempervivum* being a most promiscuous genus, hundreds of crosses are possible and many occur spontaneously where species grow in proximity in nature. The *Sempervivum* Journal reports controlled experiments in England and in Europe where almost all *Eusempervivums* (as distinct from the sub-genus *Jovibarba*) were made to cross by hand pollinization and many of these matings were successful. We get now such hybrids as *arachnoideum* x *nevadense* and *arachnoideum* x *pittonii*, presently un-named, and hope that a whole new world of such creations will come on the market in time. Mina Colvin has crossed *arachnoideum* and *ciliosum* to create two beautiful plants, very similar except for size, named 'Raspberry Ice' and 'Silver Thaw'.

The *Jovibarbas* are not so readily hybridized though Kevin Vaughn of Athol, Mass., and some others have made some progress in that direction. *J. heuffelii* and *J. hirta* have dozens of geographical forms and varieties which give the collector plenty of material.

The genus *Sempervivum* even gets away with a joke on Mother Nature, developing such chimeras as *S. calcareum* 'Monstrosum' and MacPherson's 'Oddity' with leaves mutated into tubes. Another eccentric is Vaughn's 'Wierdo' which has no proper center in its rosettes and staggers over the garden like an inebriate.

Too long have alpine gardeners scorned the order *Crassulaceae* and even *Sempervivum*, which was honored by our patron saint, Reginald Farrer. Plant a few of any species in an impossible cranny and watch a bun form, then a carpet. Before you realize it, you will be hooked.



*Saldanella hungarica*

## WHY NOT ANNUALS?

T. J. Cole

Ottawa Research Station, Agriculture Canada, Ottawa, Ontario

Even the novice rock plant grower has little trouble obtaining a display of colour in the spring and early summer. Indeed many people who wouldn't know a *Lewisia* from a *Leontopodium* have their "Rockery" (very often with concrete rocks) which is ablaze in May with such plants as Phlox, *Aubrieta* and *Alyssum*.

However, one problem with these showy and easy-to-grow plants is that they grow a little too easily. They have a tendency to creep and gradually and stealthily take over, until eventually they become the entire population of the rock garden.

You of course, as a true and dedicated plantsman, do not allow this to happen. Each of these rampageous plants is kept strictly in its place, and is cut back and generally pruned lest it encroach on some rarity. Yet without them spring would not be the same and so they are praised when in flower but cursed when they spread.

Unfortunately few of the basic alpine flowers flower during the summer or early fall. After all, in nature, true alpine flowers grow at high elevations or latitudes where the snow stays late and arrives early. If the plant doesn't flower early in the season, the seed may not have time to ripen and be dispersed before the onset of winter.

Thus we have a much more limited choice of plants to provide colour in the rock garden when the spring flush of flowers is over. One can always plant annual bedding plants such as petunias and marigolds, but really these are out of keeping with the character of an alpine garden. Who could contemplate a double petunia flower next to a clump of *Campanula cochlearifolia*?

There are, however, some common annual flowers well suited for use in the rock garden as well as a lot of genuine "alpine" annuals. In addition to providing colour during the late summer, these annuals are of great use in covering bare ground left when bulb foliage dies down; when disaster strikes and a prominent plant suddenly, for no obvious reason, dies; or to cover newly built or renovated areas while you are growing the permanent inhabitants.

In a society of this size, with the great range in climate that the members experience, it is very difficult for one person to tell another how to grow a particular plant. The best I can do is to explain how I grow them, and leave it up to you to make the necessary adjustments to compensate for your climate. Here in Ottawa we cannot safely plant out tender plants before the last few days in May. Seed sown direct can be planted from the middle of May.

Some of the annuals listed should be started off indoors in late spring to provide plants ready for bedding out. The majority can be sown direct where they are to flower, and then thinned. A few are, strictly speaking, biennials and do not flower until the second year. Some will self-seed and carry themselves on from year to year. In milder climates these could possibly become troublesome weeds, but here this is not the case. In fairly harsh climates, such as this, some plants which are perennial further south, are not winter hardy but will self



perpetuate by means of seed. From this point of view these are annuals and so are included here.

The following plants are suitable for use in the rock garden and are available from commercial sources with a bit of searching. I have, however, left out such obvious plants as *Lobularia* (*Alyssum*), *Lobelia*, *Portulaca*, *Ageratum* and the dwarf cultivars of *Antirrhinum*.

*Anagallis phillipsii* is a dark blue form of the Scarlet Pimpernel. It originates in the western Mediterranean area and may be perennial in the more southern United States. It usually self-seeds but does not become invasive. Like its scarlet form this plant serves as a weather forecast, as the flowers close an hour or so before rain. Sown direct in a sunny location they will soon make patches of colour about 6" high.

*Asperula azurea setosa* (*A. orientalis*), the woodruff, has scented, light blue flowers. It grows up to 12" tall, (which I have taken as the limit of acceptability for rock garden use), and is best sown direct. It can also be cut for use in arrangements.

*Bellium minutum* is a miniature daisy (about 2" tall), with white flowers. The petals (ray florets) are pink on the reverse. Here this is only an annual, but if planted in a sunny spot, it self-seeds in abundance.

*Calandrinia umbellata*, the rock purslane, is native to Peru. If it has a fault it is that the magenta flowers are so vivid that care must be taken to avoid colour clash with other nearby plants. While it is not hardy here it may well self-seed in warmer locations.

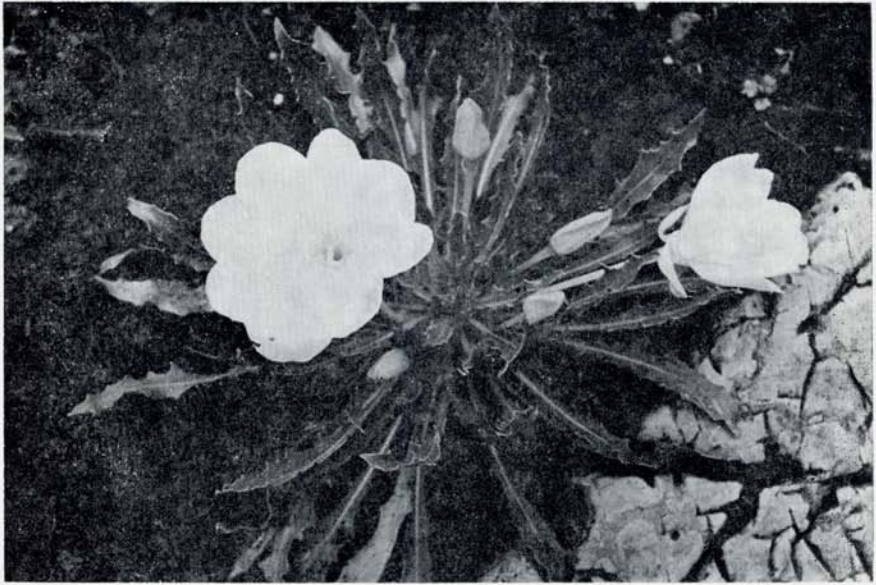
Another plant which is much longer lived in milder climates is *Erinus alpinus* and its cultivars. Here, these plants will not over-winter once they have flowered. Early sown seed will flower the first year and the plants then die. Self sown seed germinating in late spring will stand a winter



*Sanvitalia procumbens* 'Golden Braids'

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*Oenothera caespitosa*

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to flower and die. However I know that in more favourable areas the plant will survive and grow for several years although it is always fairly short lived and unpredictable.

The Californian poppy, *Eschscholzia californica*, is usually fairly tall and not suited for the rock garden. However a dwarf strain 'Double Fluted' only grows about 8" tall. It is a mixture with lemon yellow, delft rose and neyron rose predominating. As the name suggests the petals are pleated and fluted to give a pleasing display.

*Exacum affine* is better known as a pot plant, but if the seed is sown inside, plants will flower from mid-July until late September. The cultivar 'Midget' only grows 4-5" tall and so is quite suitable for our use.

From South Africa comes the Kingfisher daisy, *Felicia bergeriana*. These bright blue daisy-like flowers are very suitable for use in sunny locations. It makes compact dense plants, especially if transplanted from early sown seed. The flowers are apt to close during periods of dull weather.

The annual candytuft, *Iberis umbellata*, is usually too tall to be considered suitable for rock garden use. However, the 'Fairy Mix' strain only grows 8" high while 'Red Flash' is 9 to 12" tall. Both are best sown direct as they do not like being transplanted.

Although it is native to Portugal, *Ionopsidium acaule*, the violet cress, should be direct sown. Growing only two inches tall it becomes covered with light mauve flowers. It selfseeds but is not invasive and prefers light shade.

Botanically the correct name for the next plant is *Gilia X hybrida* but as it is listed in catalogues as *Leptosiphon* it is placed here, alphabetically. The strain 'French Hybrids' grows about six inches tall and is covered with compact heads of flowers in a wide range of colours.

There are several plants with the common name butter and eggs. One of them is the California native *Limnanthes douglasii*. It quickly forms low mounds of bright green leaves if sown outside in early spring. (It can be sown in September in milder areas). The flowers, as the common name suggests, are yellow and white, and are very attractive to bees.

The Corsican mint, *Mentha requienii*, does not ordinarily survive an Ottawa winter. However, if planted on a South to west facing slope the plant sets copious seed which has proved to be hardy. Often said to be the smallest of all rock plants, the strong spearmint scent and the tiny, one tenth of an inch, violet flowers make this plant a must for every rock garden.

The South African ice plant, *Mesembryanthemum*, is only half hardy, and must be started indoors and put out as a growing plant. Do not give this plant a choice location or it will die. Instead, plant it in the hottest, sandiest, driest spot you have and be rewarded with masses of bright daisy-like flowers in a wide range of colors.

Another California native which is available in the seed trade is *nemophila*. Unlike many of these annuals it will stand light shade — a very useful trait. Sown outside in the spring, it will be covered with sky blue flowers by mid-summer.

*Nierembergia caerulea*, the cupflower, and its cultivar 'Purple Robe' form neat bushy plants, about 6" high, from seed started indoors in March. They are covered with violet petunia-like flowers during the summer, except when the weather turns hot and humid.

While classed as a perennial, the alpine poppy, *Papaver alpinum*, is so short lived that it is best treated as an annual. It will usually self-seed and provide a succession of plants from one year to the next. Initially, sow lots of seed and weed out the poor colour forms when the plants first bloom. I have found that seed will usually produce true-to-colour plants and it may be worth collecting seed of good colour forms.

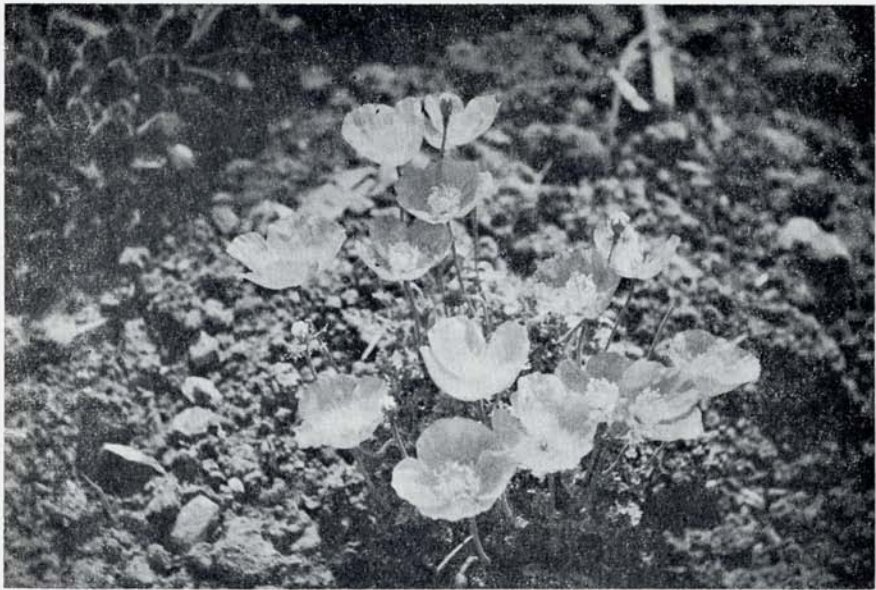
Two species of *Phacelia* are offered in seed catalogues. *P. campanularia* is the one suitable for rock garden use. It grows about 8 inches tall and as its specific name suggests, has clusters of gentian blue campanula-like flowers. *P. tanacetifolia* has pale blue flowers on two foot tall plants. Both are attractive to bees.

There are many cultivars of the annual phlox, *Phlox drummondii*, but most of these are too tall to be of use in the rockery. Even the 'Extra Dwarf Beauty' strains grow up to 20". However there is one cultivar which is admirably suited. 'Twinkles' grows eight inches high and has star-shaped flowers in a wide range of colours, usually with a white blotch somewhere on the petals.

*Polygonum capitatum* is a very low, creeping knotweed with bright green young foliage and bronzy-red older foliage and stems. Like many knotweeds it has a grey V-stripe on each leaf. The small globular flowers are pink and carried on 2" stems. It self-seeded here but the patch gradually diminished each year so that after four years it was necessary to replant. There is a cultivar called 'Magic Carpet' that, to me, is identical with the species.

Another prostrate plant that would contrast well with the *Polygonum*





*Papaver alpinum*

T. J. Cole

is the creeping zinnia, *Sanvitalia procumbens*. The bright green leathery leaves make a good contrast for the bright yellow flowers. It can be sown outside, but best results are achieved by starting plants indoors about four weeks before planting time. The cultivar 'Golden Braids' has double flowers.

The Dahlborg daisy, *Thymophylla (Dyssodia) tenuiloba*, is another yellow flowered plant. Very free flowering, the yellow daisy-like flowers are set off by fine, lacy foliage. It grows about 9" high and we obtained best results by sowing indoors and transplanting in early June. There is a cultivar 'Golden Fleece' listed.

Verbena or vervain is an annual that is not well enough known. Useful in many locations, the Nana Compacta strains such as 'Sparkle' are dwarf enough for alpine use. There are many cultivars available in single or mixed colours. 'Sparkle' is a mix with many of the plants having flowers with a white eye.

So far we have been dealing with commercially available seed which provides plants that, although in the main suitable for giving colour during the summer, are not likely to cause pangs of envy in the hearts of other alpinists. The next group, however, is composed chiefly of plants which are true alpine-arctic flora and which are correspondingly hard to obtain. Unless you happen to know someone with plants who will give you seed, your only hope is through one of the seed exchanges.

I have only tried one of the annual androsaces so far. *A. lactiflora* should be the easiest of all to grow, although for some reason it was a failure here. Seed was sown inside which was probably the first mistake, and when put out the plants were probably given too rich a soil. The plants grew well but failed to flower and did not overwinter. By periodic sowings direct where it is to



flower, it should be possible to obtain a succession of bloom. *Androsace maxima* and *A. chaixii* should also be worth growing. Mrs. Kistler of West Chester, Pa., where I saw *A. lactiflora* this spring wrote to me concerning *A. maxima* . . . "The bloom is nothing, but the seed heads are so decorative. The bloom is little larger than a pinhead but the seed capsule is large, rich brown".

While I realize that in warmer climates the creeping snapdragon, *Asarina procumbens* is a perennial, it has not been proven reliably winter hardy here. Occasionally the odd plant will survive but as a general rule it self-propagates by overwintering seed. As seed is produced in abundance, there is usually a need to thin the seedlings. They are so easy to weed out that there is little danger of the plant becoming too invasive.

As its specific name suggests *Calceolaria mexicana* is a native of central America. Almost too big to classify as a rock garden plant, nevertheless, its pale yellow slipperlike flowers are sufficiently different to be a real conversation piece. It flowered here for most of July in dry sandy soil and high shade.

There are at least four annual centaureas ranging in height from 4" to 2 feet. So far I have had no success with either *C. chloodes* or *C. pulchellum*. Both refused to flower and did not survive the winter.

*Draba lutescens* is the only annual draba I have grown. It comes from the Pyrenees and grows about 6" tall. Its yellow flowers are carried in rather lax racemes. It did not self-seed here.

*Gentianella amarella* is an erect annual with pinkish flowers. However plants grown here under this name proved to be prostrate, blue flowered and at least biennial. There are two other annual Gentianellas which one may wish to try. *G. campestris*, about 9" high with purplish flowers, and *G. detonsa*, six inches with dark blue flowers.

A lover of hot dry alkaline situations, the annual *Gypsophila muralis* should not be confused with *G. elegans* sold in many seed catalogues. This little gem will self-seed readily (indeed it has naturalized in some areas of N. America) and forms 6" mounds covered with pale pink flowers well into the fall.

The Venus looking-glass, *Legousia speculum-veneris*, is a little known annual from the Mediterranean. It is in the Campanula family and its pale blue open trumpet flowers almost hide the foliage on 6-9" plants. It flowers from early July to frost from seed started indoors, or it can be sown direct, in which case it would be later coming into flower.

A native of the northern Rockies, *Oenothera caespitosa* is a beautiful white flowered evening primrose. It is almost stemless, growing about 4" tall with comparatively huge, 2" — sweetly scented flowers. Listed as a perennial in Hortus III; it died shortly after flowering both times we grew it.

Two annual saxifrages are worth a try in anyone's garden. *S. cymbalaria* is a trailing plant with fleshy lobed leaves and yellow flowers, while *S. sibthorpii* also is yellow flowered but more upright in habit. Neither self-seed here (at least the seed does not appear hardy) but they should do so in warmer climates.

There are a couple of annual sedums that are reputed to grow well. *S. caeruleum* did not germinate here and I haven't tried *S. rubens*. A



*Thymophylla tenuiloba*

T. J. Cole

biennial species that grows very freely in the rock garden here is *S. hispanicum*. It would soon develop into a weed if not kept in check, but because it is so easy to pull out it is not a problem. The first year it grows as small grey rosettes of cylindrical leaves and presents a most attractive appearance. The second summer these rosettes elongate to about 4" tall and have white flowers. It seeds freely and pops up everywhere.

Another species that occurs in various locations and moves from year to year is *Silene armeria*, the Sweet William Catchfly. This rather tall (12") annual is very light and airy. The foliage is a tuft of blue-green leaves from which arises a thin flower stalk topped with a cluster of bright magenta flowers. It blooms over a long period and new flowers are still opening while the older ones are shedding seed. Here it is not troublesome but in warmer climates it may be too invasive.

According to all the books *Thlaspi bulbosa* is a perennial. I have tried it three times in recent years and, while there is no problem growing it or getting it to overwinter, each time it has died after flowering. In this area at least it is a biennial, but still worth growing. It forms little mounds of foliage, and the flower spikes with their dark violet blossoms rise to a total height of about 4" in early spring.

This list includes only those plants that I have either grown personally or at least have seen growing. There are many other annuals offered in the seed list, from time to time, some of which may not be very showy, while others will more than repay your efforts. I found over 80 annual and biennial plants under 12" tall, not including the popular annuals, so the choice is large.



## THE MAGIC OF TWO BEAUTIFUL *ARISAEMAS*

*Mrs. Ralph Cannon, Chicago, Ill.*

It seems that the two indigenous *Arisaemas*, *A. triphyllum* and *A. dracontium* growing in our Illinois woodland are of horticultural interest and evoke more appreciative comments from our visitors than any of the other wild flowers. I can only suppose that this is brought about by the stature of these plants. Their spectacular height of 3 to 4 feet in lieu of the recorded 1 to 2 feet and their natural poise and rhythm make them eye-catching, delightful and alluring. Although they are shy and retiring, hiding their flowers under their large leaves as if to prevent inspection, their graceful and upright stance makes them very glamorous and exotic in appearance.

These aroids are perennial herbs growing from acrid tuberous stems and belonging to the *Araceae* family of which 92% are tropical. These though are winter-hardy surviving  $-20^{\circ}$  F many times in our woods and will withstand the most inhospitable weather condition. For ideal growing conditions they like cool and shady places welcoming a moist, moderately acid soil laced with leaf mold and being happiest if growing in an environment of shifting shadows where the sun's rays are filtered through tree branches. All in all, their demands are not too stringent because they grow throughout the woodland in sun as well as in shade for they are allowed to self-sow and roam at their own will, relaxed and weaving among their neighbors.

The earliest of the two to flower in late April or early May is *A. triphyllum* or popularly known as Jack-in-the-pulpit. It has generally two trifoliate leaves which are large, flamboyant, dark green in color and stand well above the flowers. The remarkable flower has a hood-like chocolate-brown spathe striped with green and white lines tinged with purple, broad in the middle and tapering to a fine tip. Sometimes you will find an albino form where there are only white and green stripes. The spathe surrounds a thick and fleshy central column-like axis, known as the spadix. Either staminate or pistillate flowers occupy the lower part of the spadix. They are very tiny and inconspicuous. These plants are generally unisexual: that is bearing either staminate or pistillate flowers. A phenomenon of nature is that these *Arisaemas* have the ability to change their sex voluntarily. Young plants grown from seed produce generally staminate flowers. Not until these seedling plants become strong, fast growing from good nutrition and have a good supply of reserve food in their tuberous stems (tubers) do they produce pistillate flowers. This growth process takes three to four years. If the plant is not able to store adequate food in its tuber for reproduction it will remain a male all of its life. Occasionally on the same inflorescence both male and female flowers are found. A fine trait of these plants is that the blooms last 2 to 3 weeks, decidedly longer than most wild flowers.

The pistillate flowers are the ones that produce fruit or green clusters of berries after the flowers wilt. As the fall approaches the fleshy-green cluster of berries packed upon the spadix ripens and turns a scarlet-red, which is most handsome. At the attached end of the cluster stalk, you will find the tuber resembling a small turnip, growing very close to the surface of the soil which makes it obtainable by a slight pull out of



the ground if one desires it for transplanting. The transplanted tuber that had the pistillate flower may have a staminate flower the following year. Only until the health and vigor of the plant returns to its pre-transplanting levels will the pistillate flower appear again. This reversion of sex seems to take place following any disturbance in the physiological state of the plant. This is their magic.

The method of pollination is another phenomenon of these arums. If the sheathing spathe is stripped off, the true flowers will be found at the base of the columns. Gnats and minute flies slide down the columns in the mature staminate flowers and get dusted over with pollen. These pollen-covered gnats and flies then visit the pistillate florets in a waiting distant chamber and leave pollen for fertilization.

The *A. dracontium*, commonly known as the "green dragon" or the "dragon root" flowers in late May or early June. Leaves of this plant are pedately 5-17, parted into leaflets to 10" long and 4" wide. The flower has a greenish spathe. Instead of a spathe or sheath which arches over into a hood, it remains upright and the long narrow spadix protrudes above it into a long pointed golden tail. To describe accurately the color of the flowers is not satisfactory because the bloom seems to vary with the condition of the soil in which the plant is growing, but even then they are gay and elegant. When the pistillate flower wilts, a cluster of green seeds forms which later ripens to a brilliant orange-red. This cluster is larger in size than the *A. triphyllum*.

In the fall the leaves of these plants dry out leaving their conspicuous spikes of shining red berries standing erect like soldiers on parade throughout the woods. These bunches of plentifully produced bright red berries like surprise Christmas ornaments are a joy to behold as one walks through the woodland. Later as the seeds become fully ripe, the cluster with its stalk falls to the ground to produce colonies of seedlings the next spring or summer. These seedlings around their parent plant form a natural figuration.

Both of these Arisaemas grow easily from seed. To plant, the freely-produced round, creamy-white seeds from the cluster are squeezed from their red fleshy skins and planted immediately, covering with about one-half inch of soil. If you want to gather seed you must take them before the field mice or other small animals find them. These animals definitely play a role in the distribution of these seeds for they are too heavy for the wind to distribute. Happily these plants will be generous with offsets which can be used for the vegetative increase in colonies. These offsets give a faster build up of flowering colonies than from the planting of seeds.

Any good wild plant is long-lived, long-lasting in flower and possessing charm. These are two wild American aroids that have these virtues. They are not commonplace nor are they rare and difficult to grow. They are superb woodlanders in woods where many delightful treasures seek shelter and shadow and spread themselves around.

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