



Penstemon gairdneri

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

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Bulletin of the American Rock Garden Society



PENSTEMONS AND OTHER WESTERNERS IN TROUGHS

Part II — The Penstemons

MARK McDONOUGH

Norwood, Massachusetts

Drawings by Sukii Saito McDonough and the author

Within the genus *Penstemon*, there are many desirable species for the rock garden and trough, yet surprisingly relatively few are in cultivation when one considers the size of the genus. This could be for several reasons.

First of all the sheer enormity of species and the lack of easily accessible information regarding them and the recognized varieties and subspecies can intimidate the gardener who may be afraid to try an unfamiliar plant. I can sympathize with this sentiment, as an incredible variety of forms is exhibited among

penstemons ranging from one inch mat-forming alpiners to stately six to eight foot giants suited to the perennial border. In addition the literature on penstemons is plagued with synonyms and misnomers that can scare off the potential penstemon fancier.

The British sources on rock garden plants, such as Farrer's *The English Rock Garden*, only offer a small sampling of species and in these the treatment of this North American genus is often confused and somewhat unreliable. Other books on rock gardens likewise touch only

lightly on this valuable group, hardly giving the full picture. I have found that the Floras of geographical areas and individual states give the most reliable information on the genus. Many of these books are out of print, rare, expensive and difficult to locate, but I have found them worth the search. By far the most valuable source of information for the "penstemaniac", and the only available reference that describes virtually all recognized species, are the *Penstemon Field Identifiers* written by Kenneth and Robin Lodewick. These are available through the American Penstemon Society and I consider this moderately priced set of booklets worth its weight in gold.

Contributing to the above problems is the fact that penstemon nomenclature is in fairly constant flux as authorities take radically different viewpoints. This is further complicated by the ability of penstemons to hybridize freely with one another. The gardener, however, should not worry too much about the lumping and splitting of species by botanists; he can just concentrate on growing these beautiful plants, which are so suitable for a wide range of uses, though the lesser known species are difficult to come by and it takes a long, hard search to locate the more unusual ones.

The genus is subdivided into subgenera, sections, and subsections. It is useful to know these groups as each displays distinctive characteristics that help in understanding this large genus. Yet, I am reluctant to make even this suggestion as the status of subdivisions is still under considerable debate.

THE DASANTHERA SECTION

Probably the most commonly available species for the rock garden are within the subgenus *Dasanthera*, affectionately referred to as the "shrubbies" (although many other penstemons have a shrubby habit.) Plants within this sub-

genus are characterized by woody stems and leathery leaves. In addition the tube of the flower is strongly ridged on the lower portion of the throat, and the showy staminode never fails to delight upon close inspection. All penstemons have five stamens, but the fifth is sterile, lacking the anthers of the other four. This staminode is often bearded in penstemons, but is particularly showy among the *Dasanthera*. The bearded throats and staminodes, common to many penstemon species, give rise to the vernacular name "beardtongue."

P. fruticosus

The most familiar member of the *Dasanthera* group is surely *P. fruticosus*, which has a wide distribution in the Northwestern states. This yellowish green shrub is too large for a trough and has the unfortunate habit of dying out in the center. I have noticed that though these plants usually grow in exposed and arid situations in the wild, where they are found in shaded locations they flower fairly well. They are also lax and somewhat greener, yet rarely suffer the die-back apparent in plants in full sun.

A better plant for the rock garden and marginally suitable for a trough if kept pruned, is *P. fruticosus* var. *scouleri*, native to northern Washington, Idaho and British Columbia. This plant has a neater, more compact habit, with leathery, serrated leaves, and, in May, puts on a tremendous display of very large, pink-lavender, lightly bearded "snapdragons." As with many penstemons, flower color is variable, and there are several named forms to look for. One of the best is 'Charming', a pure light pink cultivar that is very beautiful. I also have seedlings coming along of *P. fruticosus* var. *scouleri* 'Red Form', a selection or possibly a hybrid widely grown in England.

By far the best variety for a trough is *P.*

fruticosus var. *serratus*. This makes a tidy little bush about six inches tall by eight inches across in several years and bears very narrow, sharply serrated leaves that gently reflex in a distinctive fashion. Although a shy bloomer, the plant occasionally produces a scattering of large lavender trumpets, less brilliant than in *P. f.* var. *scouleri*. In winter the foliage is a delightful purple color, a feature that is characteristic of many penstemons. An excellent choice for the trough, plants will respond favorably to an annual pruning, as do many of the other *Dasanthera*, and will therefore remain in scale to any sized trough. This variety grows in dry, rocky places in Idaho, the Wallawas of Oregon and the Blue Mountains of Washington.

But the very best of this group is still to come — *P. fruticosus* var. *serratus* 'Holly'. In this selected form the leaves are exceptionally thick and firm and somewhat shorter and less broad than in the typical variety. The deep green, sharply toothed foliage with crisped margins is, indeed, reminiscent of holly. Seedlings grown from this named selection will yield inferior plants, stressing the importance of vegetative propagation for named selections and hybrids.

P. ellipticus

Another *Dasanthera* I have grown is *P. ellipticus*, found at the higher elevations in the Canadian Rockies, extending southward to northern Idaho and Montana. The habit is much like that of a compressed and improved *P. fruticosus*, with which it shares a close affinity. This is a mat forming plant, four to five inches tall, clothed in relatively large leaves with the margins lightly serrated or shallowly scalloped. The foliage is conspicuously edged in red, particularly handsome during the winter months. The large, violet flowers were rarely seen in my garden; my only plant suddenly wilted and col-

lapsed during a prolonged hot and humid spell. This irritating sudden death of an apparently healthy plant can happen to a random individual, while similar plants in close proximity remain healthy. A modicum of shade will help control such demise and will also significantly reduce the occurrence of die-back that afflicts such shrubby penstemons. I hope to acquire this species again as it is a very good evergreen shrub for the trough, although vigorous spreading tendencies may have to be curbed.

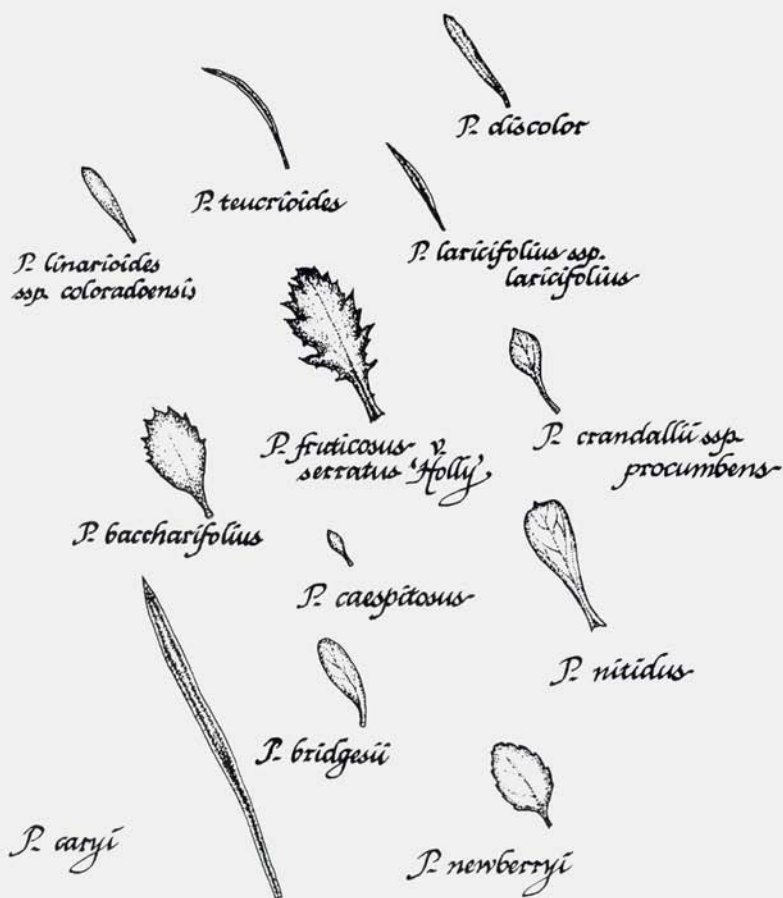
P. davidsonii* var. *menziesii

I discussed in Part I *P. davidsonii* and the confusion in its name and in that of its variety *menziesii*, treated by some authors as a species, *P. menziesii*. As the consensus of authors consider it a variety of *P. davidsonii* I, too, will treat it as such. It is as useful a plant for the trough as *P. ellipticus*. It is distinguished from *P. davidsonii* itself by its larger toothed, acute leaves and more upright habit. In contrast, *P. davidsonii* has small, rounded leaves that are entire or only minutely toothed. As with *P. davidsonii*, I have found that a lean diet is the best recipe for encouraging flowering, however the purple violet blooms of the variety do not appear here as frequently as do those of *P. davidsonii*. I have not grown the dwarf selection of *P. davidsonii* var. *menziesii* 'Microphyllus', but I'm sure it would be a very good cultivar to use in a trough.

Penstemon davidsonii grows from Washington down to California and into Nevada, while its variety *menziesii* is more northerly in its range, located in Washington and British Columbia.

P. rupicola

Penstemon rupicola is, perhaps, the most popular penstemon among rock gardeners, yet in gardens I have visited plants labeled *P. rupicola* are often really *P. davidsonii* or its variety *menziesii*.



Penstemon Leaf Shapes

Mark McDonough

There is no need for this as the glaucous blue foliage of *P. rupicola* is a distinctive as well as a desirable characteristic. The handsome foliage combined with gorgeous satiny flowers, usually of a rich pink, but varying to other colors, add up, to my mind, to one of the most beautiful dwarf shrubs of all time.

This species can be difficult to please. Excellent drainage in a scree mixture enriched with acid humus will usually give good results. Plant it in a slightly shaded spot with the protection of a large rock to

provide a cool root run; plants grown in a sharp scree in full sun scorch badly, sometimes dying out completely. *P. rupicola* and its hybrids have performed admirably in troughs for me.

Penstemon rupicola, is found in rocky clefts and crevices at high elevations from central Washington to northern California.

Of great importance to the rock gardener are the many new hybrids being developed by a handful of American hybridizers. *Penstemon rupicola* is

popular in these efforts, its progeny showing great variability in size, shape, and formation of leaves, yet remaining consistent in producing plants with dwarf habits and the beautiful blue leaf coloration. These hybrids have a stronger constitution than *P. rupicola* itself, resisting winter burn and flowering more freely. Some fine pure pink flowered forms are worth naming. Seeds of these hybrids and many others are available through the annual seed exchange of the American Penstemon Society.

P. newberryi

From California and adjacent Nevada comes *P. newberryi*, a compact spreading shrub of similar value to others discussed. The plant grows upright, about six to twelve inches tall with serrulate leaves larger than in *menziesii* or *rupicola*. Only a faint bluish (pruinose) tint can be detected on the leaves and this is an important feature used for identification. The tubular flowers are rather narrow and usually a strong rose red color. Many color forms exist and should be searched for, although they are difficult to find. There are true scarlet forms, a pure white one named 'Mt. Shasta', and the unusual apricot colored form 'Nada', once offered by Siskiyou Rare Plant Nursery. *Penstemon newberryi* ssp. *berryi* (sometimes offered as *P. berryi*) is a wider mouthed variant, the throat bearded with long yellow hairs. The subspecies *sonomensis* is a high alpine form with dark rose purple flowers. All are good trough plants.

There are other Dasanthera that are excellent furnishers of bloom and evergreen foliage such as *P. cardwellii* and *P. barretiae*. While useful in the rock garden, they are too large to be included in the trough landscape.

DASANTHERA HYBRIDS

Hybrids are common among the Dasanthera and many named cultivars

are available to the gardener. One of the best, known for its gorgeous display of large, crystalline white flowers over robust, compact bushes, is *P. 'Crystal'*. An abundance of bloom can be expected yearly, something that cannot be said about many shrubby penstemons. Although not very tall, plants quickly spread to several feet and therefore are not suitable to the trough. Another good hybrid is 'Thurman's Hybrid'. This makes an evergreen, dome shaped bush ten inches tall with an eighteen inch spread and reliably sends up long spikes of oversized lavender-pink trumpets. I would guess that this is a hybrid of *P. cardwellii* or, perhaps, *P. fruticosus*, but again, it is too large for a trough.

Of smaller proportions is *P. 'Sour Grapes'*, a selection from many seedlings of *P. davidsonii menziesii alba* x 'MarthaRaye'. The plant is evergreen, about four inches tall, although its spread to eighteen inches in three years may have to be occasionally checked. The toothed leaves are somewhat large and suffused with orange, the rich coloration particularly noticeable on the leaf margins and backs, on the petioles and on new growth. May brings to this cultivar an abundance of ample, grape-purple flowers with the inside of the tube a light lavender, giving a showy two-toned effect.

A deservedly popular plant burdened with a misleading name is *P. 'Roezlii'*, an English hybrid. I have to admit to liking this penstemon very much even though it has a few faults in performance here in New England. Prostrate, many branched woody stems are profusely adorned with fresh blue-green foliage, the edges and new growth reddish. The small acute leaves are firm and leathery in texture and are most appealing when covered with sparkling water droplets after a soft misty rain. The large, but narrow, trumpets are a brilliant rosy red.

The glaucous foliage hints that one of its parents may be *P. rupicola*. The plant is flawed by susceptibility to winter burning of the foliage; however, no matter how devastated a plant may appear in early spring, milder temperatures bring forth a burst of fresh growth and the plant looks better than ever after its "natural" winter pruning. Unfortunately, production of blossoms may also be affected by winter damage and only a few scattered blooms will appear after a bad winter. Planting *P. 'Roetzlii'* in a spot sheltered from wind will help protect this hybrid in winter. I consider it a fine plant for the rock garden or to trail over the edge of a trough, although pruning the vigorous horizontal spread may be required. This cultivar, as well as some of the other "shrubbies" can easily be trained as a bonsai if one is so inclined.

All of the shrubby *Dasanthera penstemons* seem to benefit from an occasional shearing to keep them in bounds, particularly the larger species. Plants maintained by this method will become more compact and such pruning helps avoid die-back, an affliction common among these penstemons. Die-back appears as browning of some of the leaves and growth shoots and occurs after flowering in the hotter summer months. Although not particularly harmful, plants can become unsightly. Such pruning should be done directly after flowering.

ERICOPSIS SECTION

Of perhaps greater importance to the rock gardener are the members of the less known Section *Ericopsis*, characterized by dense tufted habit and bearing leaves that are extremely narrow to filiform. Gardeners rarely recognize plants in this group as penstemons when not in bloom. This section is further divided into three subsections, although, once again, authorities cannot agree on the definition of these subdivisions. But

there is no need for the gardener to worry about these taxonomic matters as everything within this section is worthy of a choice position in a trough. Most species are relatively unknown to horticulturists and my experience with them has been rather limited to date.

P. laricifolius

Section *Ericopsis*, subsection *Ericopsis* contains a most desirable species known as *P. laricifolius* ssp. *laricifolius*. This dwarf, tufted plant is found at high elevations in Wyoming, growing in dry rocky places, and it requires flawless drainage in the garden. From a compressed woody caudex spring congested two inch tufts of exceedingly narrow, channeled, recurving foliage, as if imitating one of the smaller *armerias*. In mid-summer, a few slender, six to eight inch, sparsely leafy stems are produced with a scattering of flat faced flowers of pale lavender to purple. The corolla is rounded in outline, with the two upper petals folding back strongly. The white form, *P. laricifolius* ssp. *exilifolius*, also from Wyoming, would be a welcome addition, if it can be obtained. These are to be cherished in the best spot in the trough, in a pot, or if you dare, in the open rock garden where impermanence seems to be the rule.

I find *P. laricifolius* ssp. *laricifolius* is quite amenable in a trough on a very lean diet in full sun. Seedlings are difficult to bring to size unless germinated outside and naturally hardened off, a good rule of thumb when growing penstemons from seed. Penstemons native to dry soils damp off easily in the seedling stage and can be most exasperating. Cuttings taken in spring or late summer are a surer method of increase.

P. caespitosus

The Section *Ericopsis*, Subsection *Caespitosi* holds many valuable species

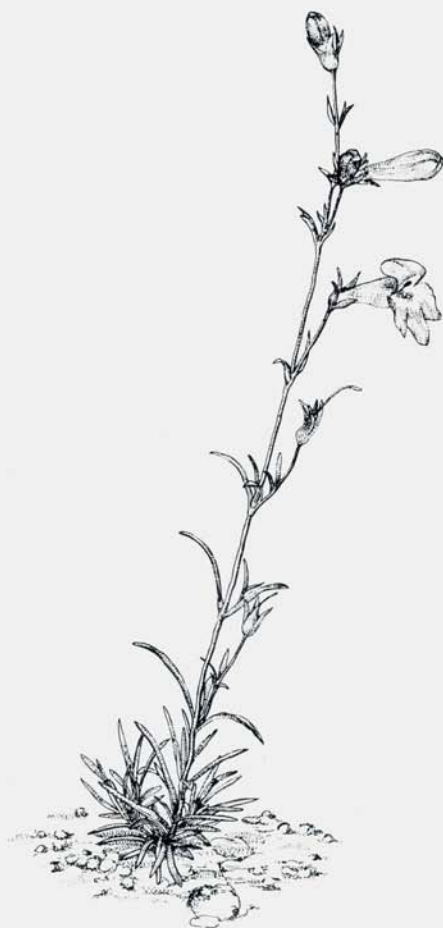
for the trough, perhaps best represented by *P. caespitosus*, a variable and widespread group with six recognized subspecies. *Penstemon caespitosus* ssp. *caespitosus* is native to high elevations in Wyoming, Utah and Colorado. It is hard to find a better evergreen creeper for the trough. A well grown mat looks like a miniature heath only half an inch high, spreading and rooting as it goes. The tiny spatulate leaves are slightly grayish and densely produced on slender trailing stems. In late spring a few small, light, but clear blue flowers are found at the tip of each stem. It is a choice species that looks terrific in a trough, inhabiting but a few square inches of growing space.

P. crandallii* ssp. *procumbens

Similar to the last, but larger in all its parts, is a plant that goes under the name of *P. procumbens*. The correct name of this plant is something of a mystery. Most Floras report that this should be classified as *P. caespitosus* ssp. *suffrutescens*. Other authorities, perhaps best representing current opinion, place this penstemon as a subspecies of *P. crandallii* and name it *P. crandallii* ssp. *procumbens*. At any rate, here we have another good trough plant with greener foliage, prostrate stems that turn up at the tips, showing a few larger, deeper blue flowers among the leaf axils than in *P. caespitosus* ssp. *caespitosus*. Stems trail nicely over the edge of a trough, but any stems that do not get a chance to root down are more prone to winter kill.

P. teucroides

New to my collection is another of these alpine miniatures, this one native to Colorado and northern New Mexico. *Penstemon teucroides* has leaves that are slightly cinereous, filiform, and are produced along the stems. This is a dry-land species requiring careful treatment in the garden. The flowers are reported



Penstemon laricifolius ssp. *laricifolius*

as being blue to purple.

P. linarioides

Subsection *Linarioides* is the last of the major groups of Section *Ericopsis*. The species *P. linarioides* embraces a wide range of recognized subspecies found from western Texas to Mexico, New Mexico, Arizona, Colorado, Utah, and California. *P. linarioides* ssp. *coloradoensis* hails from Colorado and New Mexico and is found in dry areas at approximately 7,000 feet. The plant

habit is dwarf and woody, bearing tiny linear leaves that are gray with almost microscopic scales. The flowers are supposed to be bright blue, but as this is a new acquisition, it is too early to speculate.

P. discolor

Another recent addition within this subsection is *P. discolor*, an endemic of the Santa Catalina Mountains of Arizona. Plants are similar to *P. linarioides*, though growing somewhat more upright to about twelve inches. The small fleshy leaves are distinctly tinged with a white pubescence on the upper surface; otherwise they are glabrous. The flowers are described as being white flushed with lavender, but I'll have to wait until spring to see them.

The species and many forms of *P. caespitosus*, *linarioides* and others in the Ericopsis Section are superb inhabitants of the trough garden and should be sought after. They lend an elfin charm to the small scale landscape of the trough, providing a range of form and texture. A few hybridizers are working with these small species and will, we hope, produce superior plants.

HABROANTHUS SECTION

P. caryi

A large section containing many species is Section Habroanthus. I have not tried many in this section yet, but one good one that has been with me four years is *P. caryi* from the Big Horn Mountains of Wyoming. The habit of *P. caryi* is unusual in that the leaves are very narrow, glabrous, and channeled, in a sparse, loosely matted, basal tuft. They are distinctly opposite. Early summer brings a few eight inch stems holding one sided spikes of large, deep blue flowers. The stems bend from the burden of these beautiful blooms. Cultivation is tricky as the plant tends to be short lived,

suffering during the oppressive humidity of summer months. Plant this penstemon in a sharply drained trough or pot, give it a bit of shade and *P. caryi* remains more permanent. Cuttings are difficult to root, so seed is the best method of increase.

A new acquisition, *P. garrettii* from Utah has a similar growth habit, but it is too soon to make further judgement.

P. brandegei

A fine rock garden species, also in this section, is *P. brandegei*, but the annual flowering stems, to eighteen inches or more, make it too large for the trough. In midsummer multitudes of large, luminous sky blue flowers make a grand show over a long period. Color may vary to reddish purple, which is not as attractive as the true blue forms. Dry soils in the mountains and foothills of New Mexico and Colorado are where it is found in the wild, but it seems easy and adaptable to any well drained spot in the garden.

ANULARIUS SECTION

P. nitidus

A striking number of the Section Anularius is *P. nitidus*, occurring in several Northwestern states. Plants are very stocky with a basal tuft of silvery blue leaves and a few flowering stems six to ten inches tall. On top of these are clusters of electric blue flowers. This species is seldom encountered in the garden, perhaps confirming its disdain for cultivation. Several plants have done fairly well for me, flowering in a dry raised bed in full sun, but have not spread or increased in size as I would like them to; in fact, a few seem to be diminishing. Rabbits like to munch on the tender young bloom stalks, which does not help matters. The trough would provide a protected spot, although the fairly tall leafy stems might seem out of place in a small trough. Every effort should be made to

grow this fine plant, however.

DEUSTI SECTION

P. tracyi

It is the rock garden's good fortune that *P. tracyi* has recently become available, as it is a California endemic of great beauty, known only from one area in Trinity County. This species is in the Section Deusti. It is unlikely that this plant will become confused with any others in the garden as it is most distinctive: a dwarf, woody shrub with perfectly oval-oblong leaves arranged directly opposite (a common feature among penstemons). These leaves are bright green with a precise red edge. The upper surface is glossy with the leaf veins showing slightly, giving a membranous quality to the foliage. Once again, winter burn is a problem here, but the plants quickly renew themselves in spring weather. I am still waiting to see the pink flowers, but even if they were never produced I would be satisfied with the fine foliage.

Cuttings will root easily in summer and fall. When I first took cuttings, I was amazed that even the smallest piece I removed had an extremely thick stem and I was doubtful as to its ability to root.

I dip my penstemon cuttings in Rootone and then insert them in a mixture of fifty percent coarse sand and fifty percent Perlite with a handful of peat moss thrown in. I always use a deep pot (not clay as it dries out too easily), filling the bottom three to four inches with soaked peat moss. This will serve as a reservoir of moisture to be drawn up into the rooting medium. This method works well with most dryland plants and small alpines that might otherwise rot off easily if over-watered. Most penstemons treated this way root vigorously within a matter of two to four weeks. Half ripe cuttings of the *Dasanthera* will also root rapidly in pure sand in mid-summer, if the cuttings are kept moist. I never bag

my prepared cuttings with plastic as I find this promotes rot and is totally unnecessary. There are a few species, however, that are extremely slow and difficult to root; keeping a watchful eye (and watering can) on a pot full of cuttings for up to six months may be required. As some penstemon species are short lived, it is wise to have extra plants on hand.

P. gairdneri

One successful result of this long incubation period was *P. gairdneri* ssp. *gairdneri*, (see cover picture) a cutting I collected in Washington. While visiting the dry southern end of the Wenatchees with Cliff and Olga Lewis as the gracious tourguides, I became enthralled with this marvelous penstemon, a species that is abundant in Washington and Oregon, but virtually unheard of in gardens. It is a small, erect, sparingly branched shrub with needle-like, revolute leaves, reaching a height of six to eight inches. The full, flat faced flowers are bright rose purple to almost blue, looking much like those of a mimulus. The splashy flowers are further enhanced by a pronounced white ring at the edge of the tube. The plant is known for its intractability in the garden, which may account for its scarcity in cultivation.

The rooted plant has survived in the rock garden for two years, growing painfully slowly. No blooms have showed here yet and the tightly curled, gray leaves have given way to flat, greener leaves, which is not as attractive as its wild desert-like appearance in its arid home. Though the plant is still with me, I worry each year when cold weather arrives as the shrub loses its leaves in winter and I can never tell if it is dead or not until the new leaves appear in spring. I do not know of any other shrubby penstemon that is completely deciduous.

Penstemon gairdneri ssp. *oreganus* is a taller, coarser plant less valuable than

ssp. *gairdneri*. *Penstemon seorsus* is similar to *P. gairdneri*, but is one that I have not seen yet.

P. pinifolius

A familiar and favorite species is *P. pinifolius*, a valuable plant for trailing over a low wall or the edge of a trough. The soft olive green, needle-like foliage is attractive in all seasons and this penstemon is decorated with many slender flower stems bearing equally slender orange-red trumpets throughout the summer and into the fall. The long periods of bloom and the neat mat forming habit are very useful in providing interest during the hottest summer months. Even though native to modest elevations in Arizona, New Mexico and Mexico, this species is evergreen and perfectly hardy here in New England. A common criticism expressed by other gardeners is that blooming is sporadic or altogether absent. I have noticed from experience that those plants grown in the hard scree seldom flower. My plants receive a south-west exposure, grow in well drained but enriched soil and never fail to bloom.

EMERSUS SECTION

P. bridgesii

Another red flowered species is *P. bridgesii*, a member of the Subsection Saccarantha, Section Emersus. It is native to California, Arizona and Colorado. The narrow foliage is light green and topped by loose showers of bright red blossoms with the lower lip sharply reflexed, each flower looking like a hungry little fish with a gaping mouth ready to swallow a visiting insect. The semi-woody branches are rather thin and weak; otherwise the plant is an attractive one.

BACCHARIFOLI SECTION

P. baccharifolius

The last species I'll discuss is *P. bac-*

charifolius, representing the Section Baccharifoli. This is native to Texas and Mexico, preferring limestone ledges. The dwarf woody plants grow to twelve inches or perhaps a bit more, having plum colored stems and most attractive leathery, green leaves, stained purple. The leaves are sharply toothed with fine points, reminiscent of a holly leaf. As this is a recent acquisition, I have not yet seen the scarlet flowers, nor can I attest to its hardiness. If it does prove hardy it will be a superb trough plant.

In dealing with penstemons, it seems odd that there are obvious gaps among the ranks of the cultivated species, with entire geographical areas poorly represented. The species of the Northwestern states are perhaps the best known and most frequently grown in gardens, followed closely by species of the Central Plains States. The Southwestern members of the genus, such as those from Mexico, Texas, New Mexico, Nevada, Arizona and southern California are only barely represented by a few species that sporadically appear in cultivation. Most of the truly desirable alpine from Utah and Wyoming are virtually unknown and are not in cultivation. The Eastern and Midwestern species, some of which are attractive, have not been discussed here as in general they are taller border sized perennials less useful in the rock garden, though nice for an open woodland or wildflower garden.

I have touched only lightly on the subject of penstemons, discussing a random few that I have grown. These hardly represent the vast variety and versatility of the genus.

I eagerly advocate experimenting with some of the hybrid seed that is becoming available. These recently developed hybrids offer exciting new color forms for the rock garden. Among the most notable are the Husum Hill Hybrids, boasting

dwarf plants in yellow, peach, and mixed pastel shades that should arouse the enthusiasm of any rock gardener. I hope

that each of you will try growing more of these brilliant North American plants. §
Second Part of Three Part Article

Leucothoe walteri and Darmera peltata?

ROY DAVIDSON
Seattle, Washington

Those blasted research taxonomists are at it still, seeming to take greatest delight in putting down some of the most "pat" of plant names. We're not always sure they're not motivated by pure cussedness, but they seem both glib and sound when pinned down, if we can only listen.

What must have been a merry chase-your-tail within *Ericaceae* they have apparently resolved, and in a most unique solution. "Just forget the problem and it will go away" they seem to be saying. This was the complicated situation of species within the southeastern American *Leucothoes*, and it all goes back — as do so many plants and problems — to Andromeda, who birthed so many of both, among them Willdenow's *Andromeda walteri* in 1809; this is given the new life of a generic transfer now acceptable as *Leucothoe walteri* (Willd.) Melvin, replacing by priority the deposed *L. fontanesiana*.

Everyone seemed agreed that two species were involved here, and the root of the evil apparently lay in the firm entrenchment of both as *Leucothoe catesbaei*. By legitimately depriving each of them of that designation, a solution resolved itself. The lowland swamp-dwell-

ing member became *L. axillaris* some time ago and the mountain-dwelling counterpart is now *L. walteri*. — (see Castanea, December 1977).

The second suggested change of thinking is of quite a different ilk. It seems as though from the archives of the remote tropical family *Triuridaceae* an old and disused *Peltophyllum* has been rolled out, dusted off and refueled to serve as the generic vehicle to an inconspicuous Brazilian species. All well and good, except that the familiar *Peltiphyllum* is by that act declared to be "only an orthographic variant," a loser by the priority rule to boot, and therefore an illegitimate synonym. We have been advised that we should call the umbrella-leaf saxifrage by the name *Darmera peltata* (Torrey) Voss 1899. — (see Madrono, April 1977).

But don't change your label on this one quite yet. This particular act of piracy has rankled the research taxonomists who are proposing to the next Botanical Congress that *Peltiphyllum* be subject to the Act of Conservation, which would mean that the little Brazilian would have to find another shelter. Bravo! (see Pacific Horticulture, Fall 1978). §

PLANTS FOR WALLS

MORRIS BIRD

Media, Pennsylvania

Drawings by the author

Living on a steep slope has presented me with many problems over the years. The solution was terracing by building dry retaining walls. Many plants that I was unable to grow under normal rock garden conditions in the Philadelphia area were successful when planted in these walls.

The rock ferns, for which I have particular affection, were most troublesome until I began planting them in various sites in my walls. The first planting was in an already existing mortared wall which encloses our barnyard. The mortar was well rotted and some stones were missing. *Asplenium platyneuron*, the Ebony Spleenwort, which is common in our area, had established itself long before we arrived here. As companions we added *Asplenium trichomanes*, the dainty Maidenhair Spleenwort, and that pixie, *Camptosorus rhizophyllum*, the Walking Fern. These were planted carefully in the large chinks and watered regularly until well established. Most of this old wall faces north, receives practically no direct sun and stays rather damp and cool. Later we added to this group *Asplenium ruta-muraria*, the Wall-rue, *Pellea glabella*, the Smooth Cliffbrake, and *Pellea atropurpurea*, the Purple Cliffbrake. Neither the Wall-rue nor the Smooth Cliffbrake are adapting particularly well. I will try these again in my new dry wall and give them a northeastern exposure. Dr. Edgar T. Wherry has

shown me an entire north-facing masonry wall in a Philadelphia railroad station that is covered with *Pellea glabella*. He has also discovered this fern growing on the north side of old stone bridges crossing the Susquehanna River.

The lip-ferns are my special delight because of their neat appearance throughout the year. The easiest of these to grow in the East is *Cheilanthes lanosa*, the Hairy Lip-Fern. The Western lip-ferns are more difficult. However, *Cheilanthes gracillima*, the Lace Fern, and *Cheilanthes feei*, the Slender Lip-Fern, do well in an eastern exposure with good light and a few hours of sun.

Cystopteris fragilis, The Fragile Fern, is a neat medium sized fern but in our area is too invasive and crowds out the more delicate species. *Woodsia obtusa*, the Blunt-lobed Woodsia, is much like the Fragile Fern in appearance but better behaved, while *Woodsia ilvensis*, the Rusty Woodsia, is still smaller and thrives in a cool spot with good light. It is usually found growing on exposed mountain ledges and rocky slopes. Another fern for a cool, but shady site, is *Polypodium virginianum*, the Rock-cap Fern, which usually grows on large boulders or rocky ledges in acid soil. The crested forms are numerous (though not frequently found in the wild), decorative and desirable. Another rock fern, this one from Europe, is *Ceterach officinarum*, the Rusty-back Fern, which

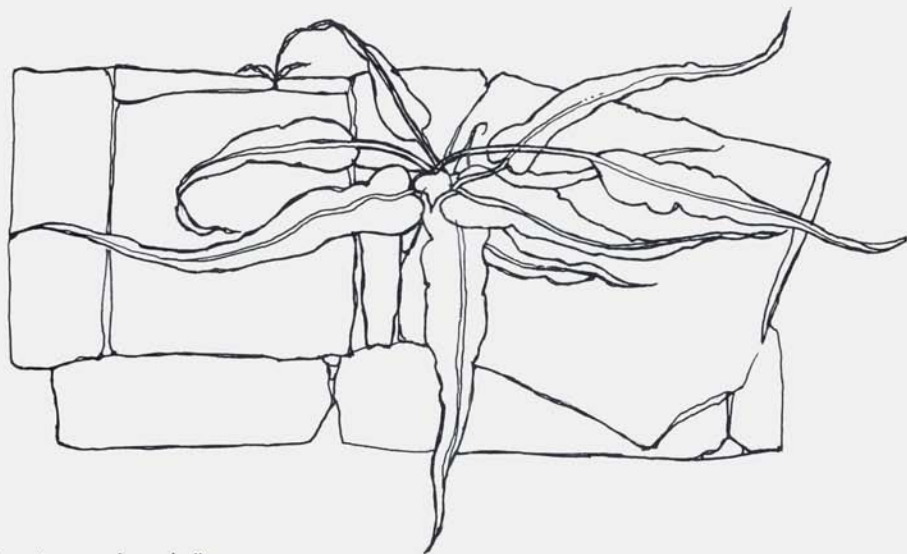
likes lime and good light.

Some of the ferns that I have just planted in my new wall are *Cheilanthes siliquosa*, a lacy western fern which grows in serpentine rocks; a dwarf form of *Adiantum pedatum* from western United States; and several forms of *Phyllitis scolopendrium*, the Hart's-tongue Fern.

Among the flowering alpine plants I have grown in walls are several genera that are at their best if given the proper exposure in such a situation. The aquilegias seem to thrive in a variety of sites and are among the real gems for wall culture. *Aquilegia saximontana*, *A. scopulorum* and *A. jonesii* are hard to beat for perfection of flower and leaf. These are all miniature plants and their delicate blue-green foliage is striking all season long. So far, *A. jonesii* has been difficult to keep growing and has not flowered. Our own eastern *A. canadensis* is a cheery note on the wall and is especially valuable if a fine compact form can be found. *Semiaquilegia simulatrix* (formerly *A. ecalcarata*), a delicate maroon

beauty, contrasts with *A. flabellata nana alba*, a waxy, satiny white, and *A. pyrenaica*, a fine dwarf blue. All of these are dwarf and delicate, with foliage contrasting dramatically against the rough, dark stone.

The small species of dianthus are both elegant and showy in bloom and like the aquilegias help bring color to the wall after the first flush of early alpiners. The standard and classic pink is *Dianthus alpinus*. It varies in many shades of pink, usually with a darker center ring. The unusual salmon colored form with a darker ring and the rare, pure albino are the most attractive. *Dianthus caesius* and *D. callizonus* bloom for a long season, frequently flowering steadily from August until stopped by heavy frost in December. *Dianthus microlepis*, *D. subacaulis*, *D. nitidus* and *D. simulans* are all fairly similar and desirable. Almost all the pinks have an important added bonus, their delightful pungent fragrance. High on the list is *D. noeanus* with tiny, fragrant white flowers; *D. squarrosus* is much like it. Another fragrant species is *D. neg-*



Camptosorus rhyzophyllus

lectus, which is one of the few pinks that does not like lime. All the preceding dianthus are doing well on sunny walls which have some shade and relief from the burning midday summer sun.

Campanulas, so valuable to the alpine gardener, make up an important sector of the wall plant list. Many have been tried, but only those which have proven most successful will be described here. My best performer is *Campanula carpatica*. It comes in many forms. Some plants have small open-faced bells, others have larger blossoms, and colors range from deep blue through violet shades to pale china blues and pristine white. Even on the wall this plant has a tendency to overseed, but unwanted plants can be pulled out easily. *Campanula garganica* is a most delicate plant that splays out against the stones to display its profusion of star-shaped flowers in various shades of blue and blue-violet to clothe the wall during a long season of bloom. When I consider that the first campanula I grew was then called *C. muralis*, a perfectly descriptive and euphonious name, I find it hard to forgive the botanist who first named it *C. portenschlagiana*, a name to which it has now reverted. In spite of its present name it is an old favorite among rock gardeners and a splendid wall plant. *Campanula rotundifolia* is as fine as any campanula; however, one should seek out the more compact forms such as the one found growing in the Olympic Mountains. I am still searching for an albino of this form and some day I hope to obtain a plant or seeds of another beauty, endemic to the Olympics, *Campanula piperi*.

The lewisias, all from our Western states, are perfect wall plants for the East. They are dramatic in flower and handsome all year around. *Lewisia cotyledon* offers the greatest variety of forms and, given an acid footing, is the easiest species to tame. *Lewisia cotyledon* forms

heckneri, *howellii*, *finchae*, and *purdyi* are usually to be found in the ARGS Seed Exchange list. The forms *heckneri* and *howellii* and other cotyledons that I cannot identify grow well in both the north and east exposure where they do not heat up too much. *Lewisia brachycalyx* and *L. nevadensis* like a sunnier position on the wall but still appreciate some relief from the summer sun. *Lewisia columbianum* ssp. *rupicola* is a perky tiny plant with a crown of dainty short stemmed rosy flowers. In flower the most beautiful of all the lewisias is *L. tweedyi*, but as yet I have had little success in keeping it going for more than two seasons and it has not bloomed for me.

For many of us in the East, the wall may be the only solution for successfully growing the more difficult Westerners. The genus penstemon is a good example. *Penstemon rupicola*, *P. davidsonii*, *P. d.* ssp. *menzesii* and *P. procerus* var. *tolmiei* can all be grown on an east facing wall with good light. Even here they are not easy to bloom, but when they do the wait is worth it.

Haberlea rhodopensis and its cousin *Ramonda myconii* have been growing nicely in my north wall for many years. Both need shade and protection from overhead rain, which can be accomplished easily by either planting them below a protruding rock or in a recess in the wall.

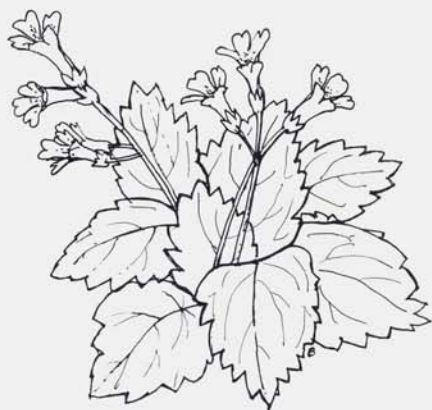
Polemonium viscosum, Sky Pilot, and *P. delicatum*, both from the Rockies, have brilliant blue flowers and delicate foliage. The silenes offer a wide range of plants from both eastern and western U.S. From the East are *Silene carolinianum* and *wherryi*, both of which produce bouquets of white or pink flowers in late spring. An especially fine color selection, which has bloomed in my wall for many seasons, is *Silene carolinianum* 'Millstream Pink'. The western silenes

are most desirable but difficult to get true from seed and, when plants are obtained, difficult to keep. *Silene hookeri* and *S.h.* var. *ingramii* should be tried as well as the compact alpine *S. acaulis*.

Many primulas will flourish in walls, but those that seem most appropriate are in the Auricula section. *Primula marginata* is always intriguing with its white edged toothed leaves protruding from the crevices. A favorite plant of mine for many years has been *P. auricula* f. *albo-cincta*. It is a stunning plant with fragrant pale yellow flowers with a white ring in the throat. The white farina on its stems and leaves add to its beauty.

It would be amiss to neglect the genus with, perhaps, the largest number of species suited to the rock garden, namely the saxifrages. Here in the East the lowly *S. virginensis* greets one in the earliest spring and is a cheerful note in the wall even if not as glamorous as its brethren. The encrusted saxifrages almost all do well in walls and their silvery foliage with white encrustations is beautiful against the rocks. Both the Engleria and Kabschia saxifrages (now lumped together in the *Porophyllum* section. — Ed.) can be grown with varying degrees of success. My experience with these latter in walls is, however, very limited. *Alyssum spinosum* (or is it now *Ptilotrichium spinosum*? — Yes. — Ed.), when established in the wall makes a fine plant that gains in character as it ages from season to season. *Alyssum saxatile* should be limited to a plant or two as it tends to take over both because of its size and by self sowing. The compact form is better behaved. Both forms should be cut back severely after blooming to force new and neater leafage.

Androsaces always delight and surprise garden visitors when blooming at eye-level on a wall. *Androsace sarmen-tosa* and *A. sempervivoides* with pink and rose blossoms are easy to establish



Haberlea rhodopensis

as is *A. lactea*, a dainty white.

Is it not odd that a disproportionate number of rock garden plants begin with the letter "A". Besides those already mentioned the following also come to mind: *Arabis*, *Arenaria*, *Armeria*, *Artemisia*, *Aubrieta*, *Asarina*, *Asperula*, *Aster* and many more. Those that grow in our wall now or have been grown in the past include *Arabis sturii* a fine shining mat of tight, small pointed leaves covered in spring with tiny white crucifers; *Arenaria montana* and *A. tetraquetra*, both neat and trim with small white flowers. *Armeria caespitosa*, now known as *A. juniperifolia*, is a special pet and if you get a fine form, cherish it! A different delight to the eye and nose is the silvery, aromatic foliage of both *Artemisia schmidtiana* 'Nana' and *A. frigida*. Just as intriguing are *Asperula nitida*, *A. suberosa* and *A. pontica*, all with the added bonus of jewel-like flowers. These plants are more difficult to keep. *Aubrieta deltoidea* grows well on the eastern wall, mine with flowers mostly in shades of rose and one a fine white.

Years ago, Henry Hohman of the Kingsville Nursery sold me a small plant named *Hypericum rhodopeum* cv. 'Sunspot'. Neither of us knew how to

grow this plant and we had many failures with it. Finally, Mr. Hohman succeeded with this tiny silver-leafed plant by providing it with perfect drainage. Now it cascades down my walls and in late spring is covered with large yellow flowers. Another similar hypericum is *H. olympicum*.

Phlox is a genus indispensable to the rock gardener and many of them seem made for walls. *P. subulata* may be over-used in suburban rock gardens, but some of the more restrained forms offer, both in color and growth habit, easy solutions for wall problem-areas because of their great adaptability. *Phlox subulata* 'Arbutus', a fine pink, and *P. sub.* 'Schneewichten' its counterpart in white, are both good candidates with their refined look. *Phlox sub.* 'Emerald Queen' is desirable because of its handsome form and delicate shell-pink flowers. *Phlox nivalis* is much like *subulata*, but blooms a few weeks later. 'Camla', a clear pink, and 'Silvestris', a deep rose do well. 'Starbrite' is a unique dwarf form of *Phlox bifida* and it made a great wall plant until I lost it. *Phlox amoena*, which is normally a trifle tall (12 inches) in the rock garden, stays much smaller and tighter in the wall. There are other easterners and a host of western phlox still untried.

Part of the wall that I am now building faces east and is shaded by nearby trees. As this area is shady and cool, I've decided to experiment with our local wildflowers. The idea came to me recently when I found a huge rock in the woods which had horizontal cracks running across it. In these fissures *Hepatica triloba* was growing in a neat row, while nearby was *Asplenium trichomanes* and *Camptosaurus rhizophyllum*. Why not plant our wildlings in the wall? *Mitchella repens*, *Epigaea repens*, *Anemonella thalictroides*, *Dicentra cucullaria*, *Hypoxis hirsuta*, *Panax trifolium* and others,

including the small ferns, are all being tried.

There is a sense of guilt in omitting so many floral friends: the sempervivums, sedums, violets and a host of others but the line must be drawn somewhere. One genus I cannot leave out, however, is *Gentiana*. Here is a group of plants that excels in either the top or on the side of a wall. The most dramatic and easiest gentian I grow is *G. scabra saxatilis*. Several years ago I noticed this listed in the AGRS seed list and sent for some. They thrived and multiplied and still glorify many of my walls each autumn with a spectacular display of their gentian blue flowers until hard frost cuts them down.

The ideal method for planting a wall is to plant as you build. As each course is laid, it is thinly covered with the standard rock garden soil mixture of one third each of loam, coarse sand and peat or leaf mold. This should be modified to suit the pH needed by individual plants (though many do not care one way or the other) by adding lime or peat to the mix. More coarse sand should be incorporated for the high alpine plants that need a leaner mix. The roots of the plants are spread out on this soil and another layer of the mix is sprinkled over them before the stone for the next course is placed on top.

It is not always possible to use this ideal method of planting a wall because of unfavorable weather or the unavailability of the plants when needed. In this case plants must be inserted into wall openings after the building is completed. The larger cracks and openings are prepared by ramming the soil mixture in the recess as far back as possible. I use a three-eighth inch dowel stick for this purpose. The young plants, which have been raised in small pots, can be knocked out and the root mass compressed to form an elongated shape to fit the chink. It may be necessary to slightly

moisten the soil around the roots to facilitate shaping. This root ball is then carefully maneuvered into the opening. It should be inserted deeply enough so the crown of the plant rests just inside the wall surface. More soil mix is then pressed around the roots until the entire opening is full. With larger fissures it may be necessary to force small stones around the crown to close up the hole.

It is crucial in wall planting that the plant should never become dry while the roots are becoming established. This may take a month or more. Individual plants may be watered directly with a fine gentle spray, but better still is to give the top of the wall a long, thorough, slow soaking so as to permit the water to per-

colate down to the plant roots.

Another method of wall planting that can be tried in all seasons except summer is seeding directly into the wall. A small ball of moistened soil mix, into which two or three seeds have been pressed, is pressed firmly into a crack, making sure contact is made with the soil within the wall. Chinking with small stones to close larger openings and, again, watering are important.

Don't forget in all cases to label plants and seeds. The label can be inserted into the crack until it is almost flush with the wall surface.

Now go out and plant your walls. Experiment with plants that you like. And if you don't have a wall — build one! §

• • •

Wanted

Does anyone still grow *Leiophyllum buxifolium* f. *intricatum*? This was a very tight form found by Walter Kolaga in the New Jersey Pinebarrens and propagated and sold by him. Information wanted by Valerie J. Kolaga, 161 W. Tulpehocken St., Philadelphia, PA 19144.

The Etymology of Saxifraga

In Volume 39, on page 169 your editor allowed a rather common etymological fallacy to stand and was quickly corrected by Knut Faegri of the University of Bergen, Norway in a delightful letter. It is nice to know we are so carefully read. Dr. Faegri's letter is as follows:

"True, the name [*Saxifraga*] refers to the breaking of stones, but definitely not the rocks indicated in l.c. The name was originally applied to *S. granulata*, the small bulblets of which were compared to "kidney stones" — an old name for nephritis. According to the old thinking, the Creator had given various natural objects the appearance of parts of the human body to indicate that they could be used against ailments of the same parts: the bulblets of *S. granulata* thus against nephritis, cf. the old name kidney-wort. Unnecessary to say, the effect was nil, but the charming old explanation should not be forgotten, however tempting it is to think of the plants' ecology today." So now we know, and we shouldn't make *that* mistake again. — Ed.

SOME ALPINES OF BULGARIA

RHODOPE MOUNTAINS: A Treasure House of Endemics

MARTIN PILNY

Prague, Czechoslovakia

Photographs by Josef Starek

The Rhodope Mountains form the second largest mountain range in Bulgaria. They consist of a beautiful labyrinth of numerous peaks, ridges, and deep afforested valleys, which alternate with cliffs and magnificent rocky walls. This mountain range spreads across southern Bulgaria to the Aegean Sea in Greece and covers an area of 18,000 square kilometers. From a geological point of view it consists mainly of gneiss and granite, though in many places broad regions of limestone and travertine also appear.

The western part of the Rhodope is especially rich in vegetation with rampant forests, while the eastern portion of the range often suffers from the hot and sunny weather that quickly eliminates any sign of verdure. Only for a short period in early spring does this section take on a really green coloration. For people who appreciate the beauty of plants the most interesting regions are in the western and central parts of the Rhodope Mountains. The entire area of this range is situated 1,600 to 2,100 meters above sea level. The main representative of conifers, which are not many, is *Juniperus nana*, creating large, round colonies.

About 100 kilometers south of the historical town of Plovdiv, near Asenovgrad, is a small village called Bachkova. It

is a well known tourist attraction in Bulgaria due to a monastery, which was built in 1083. Right above the monastery is a large and very impressive limestone crest with the highest point, named *Cervena stena* (Red Wall) towering to 1,508 meters. This is one of the most important botanical localities in Bulgaria and is strictly preserved as a National Park of 5,713 square meters spread around the top of this peak. It hosts rare endemic plant species of the region and offers fantastic scenery.

Not far from the monastery is the head of a cirque, which, after a few kilometers, changes into a deep rocky canyon. In early spring it is the bed of a narrow, roaring mountain stream; in June and July, it is a stony path for the tourists. The steep side walls of this gorge are covered by a continuous, thick carpet of the endemic glacial plant, *Haberlea rhodopensis*, whose light blue-violet flowers are a symbol of this botanical paradise, but it is difficult to photograph as there is not enough light except at noon when the sun is just above the rim of the narrow canyon.

In the forests below *Cervena stena*, it is possible to see *Moria persica*, *Scabiosa rhodopensis*, *Cypripedium calceolus* and some other ground orchids. In the alpine meadows, which host large butterflies, are sizable shining yellow cush-



ions of *Linum rhodopeum* not more than ten to twelve centimeters high. Among these cushions are tiny plants of *Jurinea mollis*, whose carmine blossoms resemble those of cornflowers, while here and there, especially among coniferous trees, there appear plants of *Lilium carnolicum* var. *jankae* with yellow flowers thirty to fifty centimeters high. In this same locality, from which pine trees were cut many years ago, there are large hairy tufts of *Pulsatilla halleri* ssp. *rhodopea*, which had ripe seeds in July. Their flowers in spring are dark violet. From this locality, lush with large colonies of lovely, unique plants, one sees the limestone walls of Cervena stena on the nearest horizon.

A magnificent plant of *Saxifraga stribrynii* was discovered in this locality in 1893; it was later registered as var. *stribrynii*. *Saxifraga stribrynii* var. *zollikoferi* grows about 150 kilometers further south in the southern part of the Pirin

Mountains — Slavjanka range (Ali Botush.)

Cervena stena is also decorated with other delightful plants of the *Saxifraga Porophyllum* section. We should first mention *S. ferdinandi-coburgii* var. *rhodopea* with its clumps of prickly leaf rosettes from which grow eight-centimeter high stems topped by remarkable balls of golden-yellow flowers. Everywhere in this same area, even on vertical, unapproachable, steep limestone walls, are large cushions of the unique plant *Saxifraga sempervivum* f. *stenophylla*, very often a meter in diameter. This plant has dark purple flowers on stems ten centimeters high and it is amazing how they thrive without any soil, growing only on the decomposed leaves of their own ancestors. Among these enormous cushions of saxifrage hang lovely dwarf bouquets of golden *Alyssum pulvinare* and *Alyssum serpyllifolium*. This rich colored mosaic is fitfully highlighted by the



Globularia cordifolia nana

carmine flowers of *Geranium sanguineum* and the rarely appearing tiny blue bells of *Edraianthus caricinus*.

It would be possible to make a long list of the plants and plant families appearing in this area, but this is not the purpose of this brief article. I only wish to draw attention to some of the more remarkable elements of the flora of these mountains.

On the return journey from Cervena stena, a stop at the Marciganica Chalet is worthwhile. The character of the landscape here is very similar to that of the previous area but with certain new plants. On the surrounding rocky limestone walls a fantastic carpet formed of vigorously thriving dwarf shrublets of *Globularia cordifolia* ssp. *nana*, nicely decorated by gray-blue flower-heads, dominates. This plant is not unknown in various European mountains; it is an interesting element of the flora of the Alps as well as the Pyrenees, but here in Rhodope, the same plant has new and incredible features. Some of these plants may be more than a century old. One

may sometimes see among the rocks what looks like a decorative piece of bleached driftwood a few inches thick. A careful look will reveal that it is the enormous root of a *Globularia cordifolia nana* firmly anchored in the rocky wall, fully alive, possessing tiny branches, narrow tough leaves, and a few charming flowers. A chamois or wild goat is probably the highly efficient artist-gardener responsible for the regular annual pruning of this fantastic bonsai.

Even this brief review of interesting plants of the Rhodope Mountains would not be complete if we omit mentioning the large cushions of *Jasione orbiculata* only two to three centimeters high, which are so similar to plants of the genus *Globularia*. The beauty of this *Jasione* is apparently derived from its habitat as it chooses to grow in localities with full exposure to the sun, suffering from drought and starvation. In such sites the roots of the plants must penetrate deep into rocky clefts in order to obtain the minimum for life.

PIRIN MOUNTAINS: A Paradise of Alpines

JOSEF STAREK

Prague, Czechoslovakia

Photographs by the author

The Pirin Mountains are situated in the southwest corner of Bulgaria, where they cover an area of 1,210 square kilometers. This mountain range has sixty peaks higher than 2,900 meters. These mountains are also attractive because of their hundred and fifty large and small lakes, which are a heritage of the ice age and are situated among steep rocky walls. Most of these lakes are at an

altitude above 2,000 meters. Since there are often thunderstorms in this area, in ancient times the original Slavic inhabitants called this mountain range the seat of Perun — God of Thunder. As the centuries passed the name gradually changed to Perin and later to Pirin. The distant, glamorous Mount Olympus (2,917 meters) may be seen from the higher peaks on a clear day.



Saxifraga ferdinandi-coburgii

This mountain range consists mainly of crystalline slate and granite, but the northern parts of the Pirin Mountains are of marble. The north-east slopes of the highest peak of the range — Mount Vichren (2,915 meters) — are of dolomitic limestone. The entire range is the home of hundreds of interesting alpinists, such as *Dianthus microlepis*, *Leontopodium nivale*, *Daphne kosanini*, *Daphne oleoides*, and many lovely plants of the *Saxifraga Porophyllum* section.

Not far from the top of Mount Vichren — the mountain of the strong wind — there are large colonies of vigorous plants of *Saxifraga ferdinandi-coburgii*. At the end of June and beginning of July they are covered with masses of charming, brilliant yellow flowers. There are thousands on thousands of them flowering as soon as the snow disappears. These alpinists are very faithful to their main locality, which is a large plateau

with rocky crevices and light calcareous soil. Here they seem to be extremely happy. Only in occasional cases do they climb up toward the top of the mountain or descend down the hills, but it is possible to see some stray seedlings of this saxifrage even near a stream in the valley.

But it's in their main locality that they are most beautiful and vigorous. Their very decorative flowers, five to eight in an irregular cyme of leafy glandular-haired stems, about 6 cm. high, are in various shades of deep, riotous yellow. Many plants create compact gray-green carpets of more than half of a square meter. If you sit on the ground among them with a camera — and there is no other practical way to take a close-up of them — you may obtain an astonishing picture, but a lot of patience is needed to take a good shot, since a strong and icy wind makes the yellow flowers flutter;

sometimes you may have to wait for twenty minutes for a single second of immobility. The reward for all the discomfort and freezing is worth it, however.

A few hundred meters westward, toward the top of Mt. Vichren, where there is a slightly different exposure to the sun and the icy wind is even stronger, there is a large rocky field which is mostly occupied by lovely plants of *Saxifraga oppositifolia*. A magnificent scene is again repeated as the plants in this locality are immensely variable in color from deep purple to pink, rose or light rose and occasionally white, often six or seven petalled, creating large and small round cushions among the big patches of melting snow. Their remarkable and brilliant flowers, in the form of upward facing cups, are almost too large because of the additional petals. These splendid saxifrages are good models for the photographer; their flowers are so tight on the cushions that no wind can interfere with the photographer's efforts to take a good portrait.

Just along the ridge, where a great number of *S. oppositifolia* are set high in the crevices of the rocky walls, there grows another, more delicate gem, which creates here and there wonderful dense mats decorated with lovely, tiny, white flowers. Luckily, these very beautiful plants are high enough to be safe from too curious eyes and greedy hands. In some places binoculars would be very useful to see the plants properly. This gem is *Saxifraga spruneri*, an endemic plant of the Balkan Peninsula, which does not like captivity even in the hands of an experienced gardener. It would be really a great pity to be there and not make a portrait of this rare beauty, but if you decide to do so, you had better first obtain the blessings of Mr. Spruner and Mr. Perun, as some ridges and ravines are rather dangerous.

There are many other saxifrages in the Pirin Mountain range and I hope to take their pictures during my next visit to this paradise of alpinists. §



Saxifraga oppositifolia



The home of *Saxifraga spruneri*



Saxifraga spruneri

A Self Watering Device

EDITH DUSEK

Graham, Washington

At its simplest, this self watering arrangement consists of a piece of plywood to which four pieces of 2×4 stood on edge are nailed to form a tray. This is then lined with plastic to make it water tight. In deference to the gardener's usually grumbling back, it helps immensely if the affair is raised in some fashion. The size depends on the needs of the gardener, his length of arm, and the materials at hand.

This tray is then filled at least half full of vermiculite, or some similar material. Getting vermiculite wet the first time is a bit tricky for the stuff has an irritating inclination to float. Pots stood upon it have a nasty habit of getting upended in this initial watering unless the tray is filled with pots to capacity at the outset. Later, when the vermiculite is saturated, there are no such problems.

We use these devices both in an open ended plastic shelter and out of doors under a high pruned massive fir tree which affords constant shade. The outdoor benches are fastened at a comfortable height on the lea side of an open board fence, which gives a degree of wind protection. While those under cover need no particular arrangements for removal of surplus water, those which receive the blessings of each passing rain cloud, must have surplus water removed or they would turn into swimming pools.

To this end, one small corner is blocked off with a short piece of 2×4

placed on top of the plastic liner. This is secured by a couple of nails into the ends. The block is provided with large, screen-covered holes. The screening keeps the vermiculite in place while allowing the water to pass through. The outer 2×4 is here drilled about half way down from the top and a short piece of pipe is inserted. To keep things water tight, joinings are tarred. This arrangement assures that water never rises more than half the depth of the tray. We found that water could be left to this height briefly in summer when evaporation is usually rapid. It also comes in handy, if the bench is out in the open exposed to rain, particularly when one must be gone for a week or so.

At other times a plastic tube is used to siphon off surplus. We soon discovered that, while a larger tube seemed to do the job more quickly, it would in fact remove all the water from the corner and the siphon would cease to function while there was yet excessive water in the remainder of the bench. A smaller bore tube, such as those used with aquarium equipment, takes longer, but it will keep bubbling unattended for hours — or days, if rain persists that long. Those who own cats will have to secure the tube in some fashion, for kitty finds the chortling sounds that the working tube emits to be positively irresistible. It can be most exasperating to find that a tray, which should be nicely drained, is still well furnished with water while the tube is lying

on the ground where puss left it when it stopped being fun. A bucket placed under the outlet of the bench will collect a supply of rain water lightly supplied with fertilizer, which plants elsewhere find most acceptable.

One will have to find out for himself which plants are suited to such an arrangement in his own area and which plants need to be kept moister by sinking the pots into the vermiculite either part way or to their rims. It will be apparent that some plants may only dally there briefly while others will be happy for extended periods. Some of my plants winter there with no ill effects. Wintering plants must be in wooden or plastic containers. Freezing may pop the contents up like cream on the frozen milk bottles of old, but they generally settle down again with no harm to the occupants. Clay pots spall badly or burst completely, so while they do fine in mild weather, they are a total loss in freezes.

If potted plants are to be left in the self-water bench for an extended time they should be checked periodically. The greedy roots tend to extend through the hole in the bottom of the pots into the moist vermiculite, which would make it necessary to break the pots in order to extract the plants for planting out or re-potting.

Here, such trays serve for weaning cuttings and seedlings from the glass

house, for starting seed, and for getting late arrivals back in condition before they go in to the garden. We have found that lewisia seed wintered here pops up like radishes in spring and young plants do well left in flats here for their first year. If it is very wet, the flats have one end propped up by shoving a large pot beneath, when it is dry the flats are again lowered. Azaleas, rhododendrons, magnolias, evergreens and other woody subjects are left for varying periods depending on their growth. Many house plants from orchid cacti to fuchsias love to summer here. Seed of many bulbs germinate well, but should be removed during the summer before it gets too wet. Hepaticas, primulas, ferns, even phlox, have done very well here for various periods of time. A complete list of successes and failures would be monotonous and in any event would undoubtedly not serve any purpose under the widely varying conditions to be expected across country.

How frequently the water in the bench is replenished depends on temperature, air humidity and, unless the bench is undercover, the frequency of rain. No doubt some ingenious person could figure some method of using a float valve or mechanical leaf to automatically supply additional water when needed, but I would hesitate to use such devices for fear of some gremlin getting into the act.

§

ARGS ANNUAL MEETING

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

A Minute Groundcover for Shade

DANIEL C. WEAVER

Hamden, Connecticut

Photograph by the author

Lysimachia japonica var. *minutissima* is a diminutive delight. Grown in partial shade with adequate moisture, its jade green, tiny leaves create compact mats which refresh the eye in July and August, yet please all year. In June or July (or sooner and later) its yellow flowers, 5 mm across (essentially stemless from the axils) glisten among the leaves which have a matte finish. Leaves, stems and sepals, when examined closely under a magnifying glass, are found to be covered with stiff, backward curved hairs.

The terminology 'minutissima' is suspect. According to Harold Epstein, who presumably first introduced the plant from Japan to this country under this name, there is no authenticated terminology. From Rupert Barneby's reading of *Flora Japonica*, *L. tashiroi* sounds somewhat closer to my plants than *L. japonica*. For our current purposes, however, let the horticultural name stand.

One of the Primulaceae, this loose-strife creates compact, slowly creeping mats from 3 to 5 mm high. Its leaves, 3 to 6 mm long, are ovate and bluntly punctate, each frequently curled a bit in several planes to give a sculptured effect. When grown on slightly uneven terrain, this sculptured effect is enhanced.

While considered by some not hardy in Connecticut, *Lysimachia japonica* survives and seeds freely for me. Our prolonged cold of -10°F. in 1979 did not destroy or damage established plants in

my garden, which is located at the top of one of the two ridges that end in New Haven. Winds are frequent and often gale force. Snow is frequently lacking and winter temperatures of zero to 20°F. are usual for considerable periods, while summer temperatures not infrequently reach 100°F.

The *lysimachia* does well in two quite different ecosystems in my garden. It flourishes in an aging trap rock path which contains a compacted rich soil (with some sand). Here water accumulates and remains when it drains to this lower area from other sections. The trap rock and compact soil not only retain water but prevent heaving. Here the roots of the *lysimachia* are 1 to 4 cm long with the above ground portions of the



Lysimachia japonica var. *minutissima*, 4½ ×

plants perhaps 1 cm high above the rock crevices, though still sessile. Undisturbed mats increase to six to twelve inches wide or more and seeding occurs frequently both in the path and nearby. Clumps are also established at the foot of a nearby sloping bed, either in embedded trap rock or at the base of rocks where roots can creep under the stones. Again, the soil is non-friable so heaving does not occur. Both these areas are heavily shaded most of the day in summer. In winter they are exposed to full sun for at least three hours. Exposure is south-west with some wind-break from the nearby house to the east, tall conifers on the south and low conifers at the west. Eighty feet to the north there is also a partial wind-break, but wind sweep is still considerable as evidenced by snow drifts (which should not imply a lasting snow cover.)

Quite a different situation exists for my terrace planting. Sun and wind exposure from the east are unmitigated and only slightly so from the north. Filtered shade protects the *lysimachia* during the four summer months but full sun is the rule during the remaining eight months of the year. Soil in this location is a mixture of

coarse sand and humus, with sparse trap rock. This area is high above the water table and less consistently moist. Mats form more slowly and, interestingly, are less decumbent. Seeding occurs more sparsely.

Careful transplanting of seedlings and division of mats to an environment similar to that first described is essentially foolproof. Excluding air from the roots, impressing a collar of rock chips, and ample water until the roots are established ensure success. Transplanting after July – August or into full sun is less predictable.

My experience is zero with collected seed of this plant, as is planting directly into coarse sand (successful with many rock plants). Transplanting to moist, coarse sand and into tufa has just been accomplished in the cool alpine house garden. While I have neither containers nor raised beds *Lysimachia japonica minutissima* should do well in either, given shade, no prolonged drought, a cool root run and no heaving. Since the plant grows slowly and is not invasive, it should be an ideal groundcover for container gardens.

This lysimachia and Hypericum yakushmanum are sometimes confused at first glance as both form small mats of tiny foliage spangled in season with little, round, yellow blossoms. The lysimachia flowers do not, however, have the fluff of yellow stamens characteristic of the genus Hypericum and the latter blossoms at the tips of the leafy stems rather than from the leaf axils. The leaves of Hypericum yakushmanum are narrower than those of the loosestrife and when examined through a glass will be seen to be smooth though speckled on the underside with glands. Most growers in Connecticut do not consider this hypericum to be reliably winter hardy though it self sows in some gardens.

— Ed. §

Germination of Seed Collected in Turkey

Tabulated by Anita Kistler
West Chester, Pennsylvania

The successes and failures of fourteen American growers, two Englishmen and one Hollander with the seeds collected by the James MacPhail-John Watson Expedition to Turkey in 1977 are quite revealing. The growers who responded to two pleas in the ARGS Bulletin were most concise with their information. While it is too late for this information to be of use for those seeds collected on the 1977 expedition, we hope it will give readers clues for dealing with seeds from plants grown from the collections of this or any other collection made in Turkey listed by the seed exchanges of the many alpine and rock garden societies.

The growers who responded are widely distributed. The Americans are from Delaware, Indiana, Maryland, Massachusetts, Michigan, Minnesota, Pennsylvania and Oregon. Where there is a notation of "hardy", it has come from either Michigan or Minnesota, both with very cold winters. One English grower is from the West Midlands, while the other resides on the Isle of Wight, two very different types of climate.

The soil mixtures and containers used varied more than expected. Four growers used a single mix for all seeds, whether bulb or perennial; the fifth used four different soil mixtures, depending on the plant material. The containers used ranged from shallow clay pans to plastic pots and Styrofoam cups. All agreed on unheated greenhouse, alpine house and/or cold frames.

The grower using 2½ inch shallow clay pans used the following four mixtures and methods:

A — 1 part loam, 1 part leaf mold, 1 part grit;

B — 1 part loam, 1 part leaf mold, 1 part grit plus tufa rubble;

C — 1 part loam, 1 part sand, 1 part grit plus tufa rubble;

D — 1 part leaf mold, 3 parts sandy grit.

In every case, except for campanulas, the pots in the alpine house were covered with cardboard to retain moisture and cut down the growth of mosses. This meant daily inspection was needed. Ungerminated pans were put outside during frosty weather.

Three growers used almost the same type of mix, but as one is English and the others American the available materials varied. The English grower planted the seed in plastic pots in a cold frame and used 2 parts John Innes Seed Mix, 2 parts sieved peat, 1 part ¼ inch grit, and 1 part silver sand. On germination, seedlings were repotted into a compost with a reduced amount of peat.

The American who planted the seeds in plastic pots used 1 part loam, 1 part sand, 1 part peat, and 1 part chicken grit. The American grower who used Styrofoam cups with three drainage holes punched in the bottom of each cup, filled them with 1 part compost, 1 part sand, 1 part peat and covered each up with an inverted clear plastic glass in an unheated greenhouse.

The following tables are a chronicle of successes, though not all germination resulted in plants that grew on to blooming size. The unlisted seed numbers are either those of seed that failed com-

pletely to germinate or in some cases seed on which no notes were received. It was felt that nothing was to be learned by listing these.

In reading the notes from the growers, it may seem that there are different

plants described under the same number; in one case it even appears as though entirely different genera were under consideration. However, these were the notes as received for each collection number.

Seed Collect No.	Plant Name	No. of Growers	No. who Germ. Seed	Notes by Growers
5598	<i>Papaver aff. tauricola</i>	1	1	Sown directly in scree. Hairy foliage.
5603	<i>Cochicum</i> sp.	2	1	
5629	<i>Colchicum</i> sp.	1	1	Growing on in alpine house in pots.
5632	<i>Fritillaria minima</i>	2	0	Received bulbs — all died.
5636	<i>Fritillaria carducorum</i>	3	2	3 received bulbs — all bulbs died. 2 germinated seed — all perished.
5646	<i>Allium akaka</i>	3	1	1 received bulbs — all died. 1 germinated seed — all perished.
5659	<i>Lamium</i> sp.	2	1	Aromatic grey foliage. Not hardy.
5715	<i>Ricotia davisiana</i>	4	3	4" tall. Long bloom period.
5720	<i>Salvia caespitosa</i>	4	3	Looks good. Now in the trade in U.S.A.
✓ 5723	<i>Alkana incana</i>	5	2	Superb — one of the best blues! 2 plants in Plant Show at Alpines '81.
5739	<i>Asyneuma compacta</i>	6	2	Compact cushion growing in the rock garden. Tuft 1" × 1", greyish.
5746	<i>Linum hirsutum</i> ssp. <i>pseudoanatolicum</i>	3	3	Long stemmed. Too spreading for pots.
5747	<i>Paracaryum</i> sp.	2	2	Biennial. 1st year a basal clump with long narrow softly felted silver foliage. 2nd year 18" stem with uncoiling crozier of densely felted buds. 100s of boraginaceous bells of dark red brown. Lots of seed.
5751	<i>Paronychia ? kurdica</i>	3	2	Too spreading for pots. 1cm. Not hardy in Midlands, England. Growing in alpine house.
5753	<i>Allium pulchellum</i>	5	3	1 grower — 2½" — 3" tall. Choice cluster, bright pink. Has multiplied and set seed in pots and rock garden. Other grower — 6" tall. Loose head of dainty pink.

Seed Collect No.	Plant Name	No. of Growers	No. who Germ. Seed	Notes by Growers
5758	<i>Tulipa</i> sp.	3	1	Grew in numbers in 4" pots in alpine house.
5761	<i>Allium</i> sp.	1	0	No seed germination. Bulbs were 6" – 8" with beige flowers. Produced seed.
5762	<i>Convolvulus</i> aff. <i>calverti</i>	6	4	Germinated, but all perished.
5766	<i>Allium tchaihatchewia</i>	2	1	Seedlings have not persisted. Bulbs received were 4" – 6", pink-purple. Excellent. Slow to increase.
5767	<i>Campanula</i> ? <i>hedgei</i>	4	4	Excellent. Strong growing. Long narrow, linear leaves — somewhat hairy.
5780	<i>Tchaihatchewia insatidea</i>	7	6	Monocarpic. 8"w × 4". Light pink bloom in racemes. Fragrant. Coarse, spiny foliage. Interesting.
✓ 5782	<i>Lamium</i> aff. <i>armenum</i>	5	3	Square yard sized plant. Smothers its neighbors. 100s of flowers.
5786	<i>Campanula stenophylla</i> (<i>tridentata</i>)	3	2	Nice compact cushion. Easy. Greyish tuft 1" × 1".
5797	<i>Jurinella moschus</i> ssp. <i>pinnatisectus</i>	8	8	In rock garden and alpine house. Lax, loose mat. Leaves 4" long, very thick, much cut, basal, wooly. Fine foliage.
5798	<i>Campanula lebouriana</i>	4	1	Deciduous. Many died in winter.
5805	<i>Campanula</i> (<i>lebouriana</i>) sp.	8	5	Dwarf, saxatile form. Rosette of narrow, silver, hairy foliage. Violet-purplish blue bell. 1 or 2 on a stem. ? Monocarpic?
5809	<i>Erysimum</i> sp.	2	2	In rock garden, bugs liked foliage. Narrow silver leaves.
5812	<i>Allium</i> sp.	1	1	Easy both seed and bulb. Best of the alliums. 4" – 6" tall. 2 clusters of lavender and white bloom per stem. Bulbs multiply.
5813	<i>Campanula bommuelleri</i>	4	3	Growers had 2 forms. No bloom yet. Rosette forming — one glossy leafed, other quite hairy. Vigorous in rock garden.
5816	<i>Valilovia formosa</i>	3	3	Alive in double pot in alpine house. Grew for 2 years then died.

Seed Collect No.	Plant Name	No. of Growers	No. who Germ. Seed	Notes by Growers
5820	<i>Linum pycnophyllum</i> ssp. <i>kurdica</i>	6	4	Germinated well, but all quickly perished.
5821	<i>Fritillaria minima</i>	5	1	1 grower got bulbs. In pots and rock garden. No bloom yet.
5830	<i>Alyssum</i> sp.	3	2	Died in summer humidity.
5831	<i>Thymus</i> sp.	3	2	Slow growing. Could be good.
5833	<i>Tulipa</i> sp.	1	1	4", plastic pots in alpine house.
✓ 5835	<i>Veronica orientalis</i>	5	3	6" × 10", hardy, bright blue. Sprawling stems clothed with needle-like foliage. Woody stems carry spike. Choice. Too vigorous for pot culture.
5838	<i>Convolvulus assyriacus</i>	8	2	Question if any are alive. 1 struggled then 2nd year doing well.
5840	<i>Veronica thymoides</i> ssp.	4	4	1" × 3" mat, very intense blue bloom. Foliage is almost white with wool. Many bright blue flowers. Rather loose. Probably not hardy. One plant shown at Alpines '81.
5845	<i>Dianthus</i> ? <i>brevicaulis</i>	8	8	Nice spiny dark green cushion — 1" × 1½". Pink flowers on 2" stems. Stems not very brevis.
✓ 5847	<i>Convolvulus compacta</i>	4	1	Superb. Lovely silver cushion.
5849	<i>Veronica caespitosa</i> ?	6	5	Superb. Large flowers. Silver, wooly rosettes. Covered square yard.
5850	<i>Linum olympicum</i>	6	5	Great. Flat mat of grey leaves. Flower stems grow horizontally. Flowers — 1" in diameter, lavender-pink. Bloom lasts one day. Vigorous.
5853	<i>Galium</i> aff. <i>aretioides</i>	5	4	2" × 6" bun studded all over with white blooms. Very transient. Interesting bun, too vigorous for pot culture.
✓ 5854	<i>Jasione supina</i> ssp. <i>supina</i> ?	4	1	Excellent specimen. Almost white, hairy leaves in flat cushion. Needs very dry conditions. Set seed.
5857	<i>Acantholimum</i> ? <i>roseum</i>	5	5	Nice mound, 8" wide × 4" high in open. No report of bloom yet.

Seed Collect No.	Plant Name	No. of Growers	No. who Germ. Seed	Notes by Growers
5859	<i>Tracheliopsis</i> sp.	4	1	2" × 6", slightly steely blue heads. Superficial resemblance to <i>phyteuma</i> . Fluffy delicate inflorescence.
5861	<i>Campanula teucrioides</i>	5	5	Excellent leaf form. Small, very grey tufted with longish leaves. Romping 2'0" plants.
5862	<i>Arenaria tmolea</i>	6	4	Some formed very dense cushions. Others were very straggly.
✓ 5863	<i>Linum aretioides</i>	2	2	Growing in pots in alpine house. Very difficult — all died.
5864	<i>Cardiopatium corymbosum</i>	2	2	Died in spring rains. 2nd sowing got 4 plants. Just hardy. Dwarf thistle.
5869	<i>Silene caryophylloides</i>	4	4	Glandular foliage. Slugs like it. 6"w × 1½"h in rock garden.
✓ 5870	<i>Linum aretioides</i>	7	6	1" × 3" with ½" light yellow, beautiful blooms. Narrow greyish foliage. Difficult. Quickly died. Not doing well.
5875	<i>Onosma nanum</i>	2	1	Not very nanum.
✓ 5876	<i>Alyssum propinquum</i>	7	5	Prostrate shrub. Excellent foliage — 12" across × 3" high.
5881	<i>Globularia dumulosa</i>	8	6	In individual pots in alpine house. Tiny rosette lost in hot weather.
5882	<i>Origanum</i> sp.	3	2	In rock garden, 10" × 6" with heavenly, pleated silvery leaves — very aromatic. Small pink-lipped flowers. Easy from cuttings. 12" × 6" very hardy. ? <i>Origanum</i> ?
5885	<i>Michauxia campanuloides</i>	1	1	Very hardy in rock garden.
5888	<i>Origanum</i> sp.	2	2	In rock garden it resembles <i>Origanum pulchellum</i> . Quite a distinct plant.
5900	<i>Lamium</i> aff. <i>armenum</i>	5	3	Annual?? In rock garden it needs to be kept alive by cuttings. Appear to be two forms: 1 with spotted lip, other has plain lip. Plant was shown at Alpines '81.
✓ 5904	<i>Chamaecytisus pygmaeus</i>	2	2	Nice shrub. Hardy.
5906	<i>Veronica kotschyana</i>	5	5	Very straggly. Hairy buds.

Seed Collect No.	Plant Name	No. of Growers	No. who Germ. Seed	Notes by Growers
5917	<i>Labiatae</i> sp.	3	3	Aromatic grey green foliage. Forms a loose mound similar to <i>Dracocephalum renatii</i> . Hardy in alpine house.
5919	<i>Amebia densiflora</i>	2	2	Successful in pots.
✕ 5920	<i>Gypsophila briquetiana</i>	8	8	Quite easy in rock garden and alpine house. Neat bun 4" × 4" good even out of bloom. Few blooms on stem are white with deep rose eye. Cuttings strike easily. Very slight difference in A, B, C.
5921	<i>Erysimum kotschyannum</i>	2	2	Not <i>Erysimum kotschyannum</i> . Set seed, but short lived.
5924	<i>Lamium</i> ? <i>sintensii</i>	3	1	White bloom. Set seed in alpine house, which germinated.
5925	<i>Alyssum</i> sp.	7	5	2" × 6". Good plant with light yellow raceme that bloomed off and on all summer. Grey wooly pointed leaves. 2" tall plants with delicate pointed leaves and tubular pink flowers — 5 lobed — 1/2" across. Monocarpic. Too spready for pot culture. Not hardy.
5926	<i>Aethionema caespitosa</i>	1	1	Pale pink. Poor plant. Weak grower.
5936	<i>Veronica liwanensis</i>	4	4	Superb prostrate mat. Hardy. Handsome foliage, 1/4", ovate, toothed, glossy. 5" mat flat on ground.
5940	<i>Origanum rotundifolium</i>	2	2	Superb round, cupped leaves. Lime green foliage.
5945	<i>Potentilla oweriniana</i>	4	4	Nice silvery leaves. No flowers yet. Like a larger <i>Potentilla nitida</i> .
5952	<i>Jasminium fruticans</i>	4	2	Nice. Small dark green leaves. §
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Weeding is a chore, which, as you work, encourages your mind to travel into the further reaches of thought . . . [While weeding], nature leads the workaday circuits of your mind into the serene realms of contemplation.

— Joseph Kastner in the *Smithsonian*

THE VIRTUES OF EPIMEDIUMS

MRS. RALPH CANNON

Chicago, Illinois

Drawings by Margaret Sorenson*

For a long season of loveliness, plant the amiable epimediums. These low growing herbs of the north temperate zone belong to the Berberidaceae and are judged as good natured, tolerant plants. This judgement may be caused by the fact that they survive despite the treatment they are so frequently given; they are all too often relegated to sunless spaces with poor, often parched soil. Even under such conditions they still offer their beautiful foliage and flowers as best they can with the result that many gardeners have thought that these plants are best used in such odd corners and waste places. Possibly if epimediums were not so accommodating they would be more appreciated. If given the opportunity and properly treated, they will make as fine a display of flower and foliage throughout the entire season as any woodland plant.

Epimediums are tolerant of any kind of soil providing it is not soggy wet. They will grow well in acid, neutral, or limy loam. I grow them in woodland soil with plenty of humus and adequate moisture — no fertilizer added. They like dappled shade if you can provide it, but if they have to be in full sunshine, give them a light, moist soil along with ample humus. Since the roots of epimediums are shallow growing, they should not be disturbed by cultivation of the soil

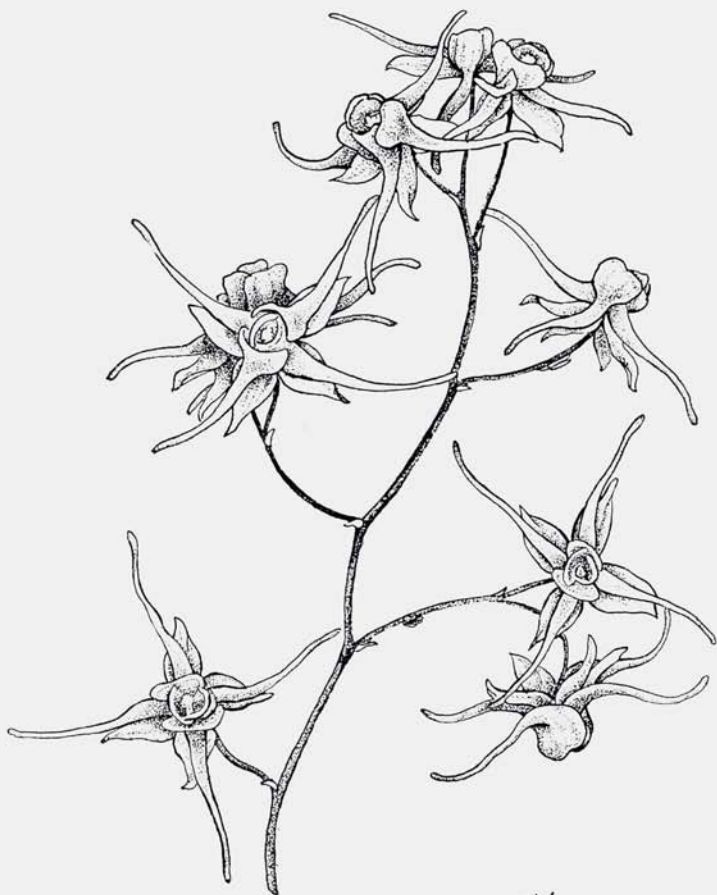
around them, nor should this be necessary as the dense top growth tends to smother out weeds.

As the semi-evergreen foliage persists on the plants throughout the winter, even after it has turned sere and brown in late fall, all the old leaves should be clipped off the plants before spring arrives, otherwise the dense old foliage obscures the beauty of the dainty flowers and new leaves. As the blossoms fade after a long season of bloom they are replaced by the colorful fronds of new heart-shaped leaflets, whose beauty lasts throughout the summer (no matter how droughty) and on into the early winter. Sometimes the leaves take on a red coloring mixed with bronzy brown in autumn. Though these plants can endure considerable competition, to prevent nearby plants from concealing the beauty of the compound leaves, the neighbors of epimediums should not be too tall.

The outer portion of the intricate flower is composed of two layers of petal-like sepals. The four inner segments are the true petals. These include the nectaries, which in some species form prominent spurs that add considerably to the airy grace of the blossoms. The petals and sepals are frequently of different colors.

It seems that few seeds are produced by epimediums, at least in this county. I have noticed no seeds on my plants. Yet in some gardens epimediums self sow,

*Drawing reprinted from "Saxiflora", ARGS, December 31, 1938.



M. S. ROSEN

Epimedium grandiflorum

though never, I believe, abundantly.

Root division is the best and easiest method of propagation. The timing of such division is an important factor. Some growers make the divisions just prior to the plant breaking dormancy; others divide their plants just after the blooming period. These divisions should be cut with a strong, sharp knife, for the roots are tough and wiry. The separated pieces can be planted in pots containing a mixture of equal parts sand, leaf mold and vermiculite. After these are well established they may be set in the garden. Also, in late autumn, hard pips may appear just below the surface of the soil. These may be cut off with a few attached roots and planted in small pots for further growth before planting into permanent sites. Division of epimediums not only increases the number but the vigor of the plants and is an excellent way of quickly covering a wide area.

For my first planting of epimediums, I obtained three varieties: *E. alpinum rubrum*, *E. sulphureum*, and *E. grandiflorum*. These I planted in groups of three each. *Epimedium alpinum rubrum* is a colonizer, semi-evergreen, with rhizomatous roots. It has wiry stems about nine inches in height, which carry ferny clusters of heart-shaped leaflets, bronze-green in spring and bronze in fall. The small flowers are dark red, in panicles that do not rise above the old leaves, so be sure to clip the old foliage off before spring arrives so the dainty blossoms can be enjoyed in May and June. Some botanists consider *E. alpinum rubrum* a hybrid between *E. alpinum* and *E. grandiflorum*.

Epimedium sulphureum is a hybrid, a form of *E. x versicolor*, a cross between *E. grandiflorum* and *E. pinnatum colchicum*. All hybrids of this cross have handsome foliage, reddish brown when young. The flowers are usually old-rose and yellow with red tinged spurs, but in

E. x sulphureum they are a lovely clear yellow.

Epimedium grandiflorum was previously known as *E. macranthum* and has cordate leaflets that come to a sharp point. The flowers are all beautiful, large, held well above the foliage, and with prominent spurs. My first plant had pure white blossoms, but in the species they may be white, pink, violet, or even yellow. A particularly fine form with crimson blossoms and long spurs tipped with white is called 'Rose Queen.' *E. roseum* and *E. violaceum* are other named color forms of this species.

In later years I acquired a number of other species, and hybrids of which there are quite a number. Many of them are worth seeking out as they are valuable plants and make excellent inhabitants of the shady garden.

Among the species is *E. pinnatum*. It is a robust plant with large leaves cut into numerous leathery leaflets on stiff twelve inch stems. In early spring a display of yellow flowers with short brownish-red spurs occurs. *Epimedium pinnatum colchicum*, (the other parent with *E. grandiflorum* of *E. x versicolor*.) from the Caucasus, has somewhat larger blossoms.

Epimedium perralderianum is a tough and vigorous plant, much used as a ground cover. It has large yellow and brown flowers and the additional charm of bright green leaves tinted with red and brown. *Epimedium pubigerum* has pale yellow and rose to white blossoms, while *E. sagittatum* from China, has large firm leaves fringed with horny teeth on twelve inch stems. Its numerous small flowers on ten to twenty inch stalks are white and brownish yellow.

Epimedium x youngianum is generally considered to be a cross of *E. grandiflorum* and *E. diphyllum*. Some botanists classify *E. diphyllum* as *Aceranthus diphyllus*. The hybrids tend

to be short, like their parent *E. diphyllum*, which is only four to eight inches high. The flowers of the *E. x youngianum* hybrids are usually bell-shaped with short spurs and are quite pendulous. They are creamy white or rose-red. The leaves are beautifully veined. *E. x niveum*, generally listed as *E. niveum* in the trade, is one of the forms of *E. x youngianum* and a favorite with rock gardeners as it is a dainty plant

only six inches in height with large dazzling white blossoms. It is a delightful little plant and an early bloomer.

There is something exciting about growing a plant that is different from those usually seen in gardens. Growing epidmediums in my woodland has proven their stamina and adaptability and only many years will really show how long they will persist and multiply. §



NEW YORK BOTANICAL GARDEN ILLUSTRATED ENCYCLOPEDIA OF HORTICULTURE

by Thomas H. Everett, 1980-1982. Garland Publishing, Inc., New York, N.Y. \$52.50 per volume, \$525.00 for complete set of 10 volumes.

The eighth volume of this extraordinary garden encyclopedia has just come off the press, with two more yet to come. With each successive volume my admiration for the work and its author has increased. The quality and aptness of the illustrations are splendid. They provide in the case of plants described a quick and precise visual image, as well as in the case of accounts of gardening procedures and methods.

The writing itself is eminently lucid. There is, for instance, in the eighth volume a many-page entry under the heading "Plant Names," which explains in a thorough and clear manner this intricate and sometimes vexing matter. This section includes an extensive listing of scien-

tific epithets with sound English translation.

The coverage of topics is amazingly wide-ranging: from potatoes to papiophyllums, from manures to meristems. Yet throughout this sweep one can detect the hand of Thomas H. Everett in the clear, skillful writing. It is truly a monumental work.

A previous review of the first several volumes appeared in the *Bulletin*, Vol. 39, p. 144. — H.L.F.

WILD FLOWERS OF THE PACIFIC NORTHWEST

by Dr. Lewis J. Clark, edited by John G. Trelawny. Gray's Publishing Ltd., Sidney, B.C., Canada. \$49.50 in Canada

That favorite book of British Columbia plant lovers — *Wild Flowers of British Columbia* — has been republished to include Alaska, Washington, Oregon, and

the western part of California north of San Francisco.

John Trelawny, who wrote the six Lewis Clark field guides (now being re-printed), wrote descriptions of a hundred new species and chose about a hundred new pictures, mostly from Dr. Clark's collection, for this book. He also had the unenviable task of chopping most of the poetry and cropping or removing some of the original pictures. But for those of you who have wanted the original book and couldn't find it because it is out of print, do not hesitate to buy this one. Most of the same wonderful descriptions and pictures are still here and there is the important bonus of being able to use it for plants from the very different country near the California border.

This is a big book, 600 pages, 8 by 12 inches, which until you own it would seem to belong in a library. However, I never go on a trip into the mountains without it. Though it is a bit heavy for back packing, when you return to your tent at night, it is wonderful for checking out species.

Dr. Clark was a professor at the University of Victoria and he believed that he could teach the reader to know and remember and use botanical terms and names if he explained them. For instance: reading about Portulacaceae, you learn that the garden portulaca came from Brazil in 1582 and that there are 400 species, whose epicenter is in the Northwest States of the USA. The name dates back to Pliny, who 1900 years ago used *portu*: to bear, and *lac*: juice or sap to form the word portulaca. Then, under the heading *Lewisia*, Dr. Clark tells you about the Lewis and Clark Expedition, and finally and most memorably tells you how Captain Meriwether Lewis found an unknown plant near Missoula, Montana, dried it, pressed it and sent it to the famous botanist Pursh, who, finding it still slightly alive, planted it. When it

sprang to life, Dr. Pursh christened it *Lewisia rediviva*. The pictures in the book are superb and one of the great ones is of *L. rediviva*, three and a half times life size, occupying a whole page.

In the descriptions Dr. Clark has tried to avoid too many botanical terms, preferring "wider at the base" to deltoid, however you should have a minimum of botanical lore in order to use the book comfortably. In the first portion of the text each botanical term is explained as you come to it; if you forget its meaning later there is an illustrated glossary. One of the ways in which the author helps you to identify plants can be most easily explained by using part of his description of *Claytonia lanceolata*. "...two cupped sepals and five petals, white to pinkish lined with deeper pink and joined just at their bases..." Dr. Clark then goes on to say that *Montia* species share all these characteristics but suggests that you scratch aside some of the soil at the base of the plant. If you find a corm, you have a *Claytonia*; if you find fibrous roots, you have a *Montia*.

The book covers almost 900 species and contains 660 color photographs. Its aim is to describe most of the showy plants in the area, excepting trees, grasses and rushes. Also left out are many composites, crucifers and legumes. In the aster description you understand why he left out a lot of the composites: "In North America there may be about 300 species of aster, many of which hybridize freely so that the amateur, who would like to identify an aster in hand, is likely to sympathize with [the remark of] the American botanist Asa Gray (1810-1888), 'Never was so rascally a genus!...[they] may reduce me to blank despair.'" However, Dr. Clark does give descriptions of seven out of some thirty-five species in the area covered by this book and ways to distinguish erigerons from asters.

Dr. Clark was a famous plant photographer and some of his photographs are so superb that they would make the book worth purchasing even if it were not also so useful and entertaining. Some of the close-ups of the saxifrages are extraordinary — *Saxifraga feruginea*, with orange spots on the upper petals and coral colored anthers looking like lollipops; at twelve times magnification you can see clearly how much the three upper petals differ in shape from the lower two. Other full page magnified pictures that I particularly enjoy are those of *Erythronium revolutum* at 2x, *Fritillaria lanceolata* at 3x, and *Sisyrinchium douglasii* at three and a quarter times magnification.

In the United States this book can be obtained from Superior Publishing, P.O. Box 1710, Seattle, Wash., 98111. In England it can be purchased from Serendip, 11 Broad St., Lyme Regis, Dorset, and in Canada it is available from Gray's Publishing Ltd., Box 2160, Sidney, B.C. V8L 396. — GHN

PLANT HUNTING IN NEPAL

by Roy Lancaster. 1981, Croom Helm, London, England. \$19.00

This is a fascinating new book about the autumn (1971) collecting trip made by three horticultural botanists into the interior of Nepal. Many of the seeds were collected for the first time and only now are getting established in famous collections in Europe and Great Britain.

This reviewer was surprised at the number of familiar plants that originate in the Himalayan area, but even more intriguing are the rare plants described: *Saussurea gossypiphora*, a plant densely clothed with long, silky, white hairs; *Primula capitata*; *Delphinium nepalense*; and the mat and cushion former, the golden edelweiss, *Leontopodium monocephalum*.

The courage of plant explorers, both past and present, who set off into areas barely charted to face the discomforts and hazards of rain and mist, which render the trails slippery and sometimes cause the members of the party to become lost from each other, is impressive. The descriptions of traversing a bamboo thicket make one realize the danger involved. But according to author Roy Lancaster, the full plant presses, and seed packets exploding with old, new, and reintroduced species make such a trip worthwhile.

The thirty-nine excellent line drawings of plants, such as *Delphinium glaciale*, *Cremanthodium reniforme* and *Meconopsis horridula*, and the twenty color plates enhance the text and alert the reader to some of the rarities that may show up in seed lists in future years. *Plant Hunting in Nepal* is not only most enjoyable reading but is also definitely a must for the library of the dedicated rock gardener. It is now available from your ARGS Book Store — see outside back cover of Bulletin. § — A.K.

• • •

Weeds are the plants of which you'd just as soon not have so many, but that none-the-less spread and thrive in your garden regardless of blights, bugs and weather.

GARDENING WITH LIVING FOSSILS

FRANCES GALLOGLY

Westport, Connecticut

Illustrations by Laura Louise Foster*

Why grow a plant that never flowers and whose stem is so rough with silica that it will scratch when drawn across a fingernail? The equisetum, or horsetail, is considered an invasive weed by most gardeners, but there are a few species worth having.

I enjoy growing horsetail for their bamboo-like grace and because I agree with the authors of *Wild Wealth* when they wrote: "There are some plants that communicate a sense of history.... This plant was in existence in the millennia when the coal measures were laid down and somehow it has survived to the present day, in the company of a few club mosses, ferns, and the ginkgo tree."

The horsetail is the only living descendant of giant trees that flourished in the swamps of the Carboniferous period two hundred million years ago. These trees, called Calamites, grew to nearly one hundred feet, but died out when the climate became dryer.

Fossil remains lead us to believe the Calamites formed great jungles beside rivers and lakes and in shallow swamps. They had thick ribbed and jointed trunks, much like modern palms, with branches and leaves in whorls ringing the trunk.

Calamites produced spores in such quantity that some coal deposits, called

"cannel" coal, consist predominantly of fossilized spores. A type of cannel coal known as "jet" is cut and polished for ornaments.

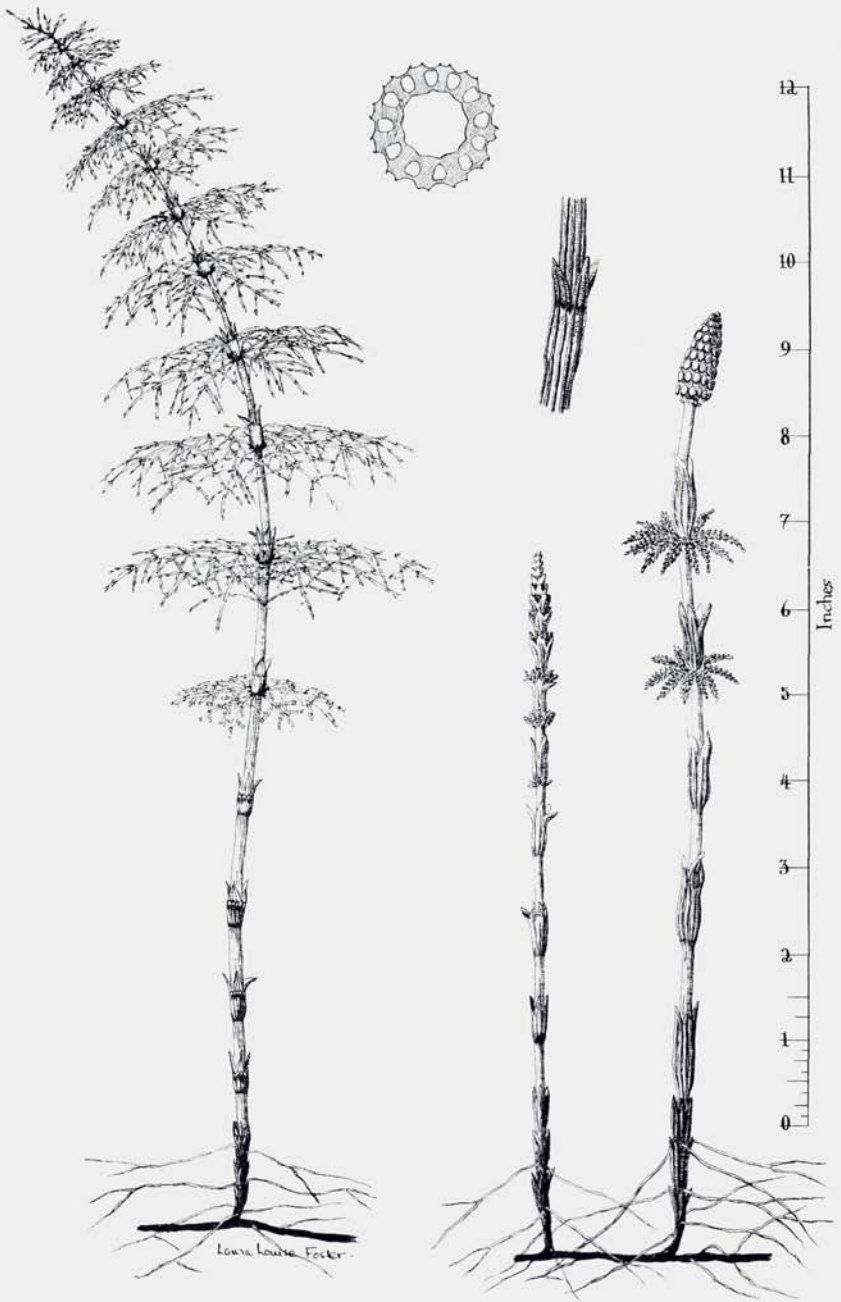
The Calamites vanished in the Triassic Period, replaced by smaller species that evolved into the present day horsetail. Some botanists feel this last remaining relative of the giant calamite is itself treading the road to extinction.

The horsetail is a slender reed-like plant that looks like a diminutive olive-colored bamboo. It thrives in moist gravelly or sandy environments with poor drainage and is frequently encountered as a roadside weed near swamps, in wet meadows, and along railroad embankments. The stems are distinctly jointed and hollow with longitudinal ribs and ridges. At the joints, or nodes, small tooth-like leaves appear like papery scales in whorls around the stem. What appear to be leaves, are actually branches, also occurring in whorls at the base of the nodes.

There are approximately thirty species of horsetail, of which perhaps ten are found in the United States. Few exceed four feet in height. They range from the tropics to cool temperate zones with the exception of Australia and New Zealand where none are found. Some species are shrubby and one South American species forms a vine that may reach a length of thirty feet.

Some species have two types of growth: a vegetative stem that is green

*From Boughton Cobb's *A Field Guide to the Ferns*; Houghton Mifflin Co.



Equisetum sylvaticum

and branched and a fertile or reproductive stem that lacks chlorophyll and bears a small cone, called a "strobilus", at the tip. Some species bear stobili on vegetative stems and do not send up separate fertile shoots.

These cones contain shield-shaped structures called sporangiophores in which spores are formed. The fertile stems appear in early spring and disappear as soon as the spores are dispersed. Then the more familiar green vegetative shoots emerge. The tiny green spores have four ribbon-like wings called "elators" that coil in humid weather and uncoil in dry air helping to disperse them. The delicate spores survive only a few days. They germinate on moist soil forming gametophytes the size of a pin head.

A more common type of propagation in horsetail is vegetatively through underground rhizomes that bear fine hair-like roots and, in some species, small bean-sized tubers for food storage. The rhizomes, like the stems, have nodes, grooves, and ridges. It is these deeply-penetrating rhizomes that make horse-tails so difficult to eradicate when they become garden pests. Although some chemicals may be effective, the best method to halt their spread may be to improve the garden soil. They do not thrive in well-drained loam.

Horsetails can be a serious problem for farmers and ranchers since they are poisonous to livestock, especially horses. They contain chemicals that destroy thiamine (vitamin B-1.) Administering doses of the vitamin restores the animal's health except in later stages of the ailment, known as "equisetosis."

Horsetail derives its name from the Latin "equis" (horse) and "seta" (tail or bristle). The most commonly encountered species is *Equisetum arvense* also called Field Horsetail, Scouring Rush, Horsetail Fern, Pinegrass, Foxtail Rush, Bottle Brush, Horsepipes, and Pinetop.

The Field Horsetail will grow under dry or wet conditions and it is the one to avoid planting as it is the most difficult to control. It is a variable species, and occurs in at least seventeen different forms.

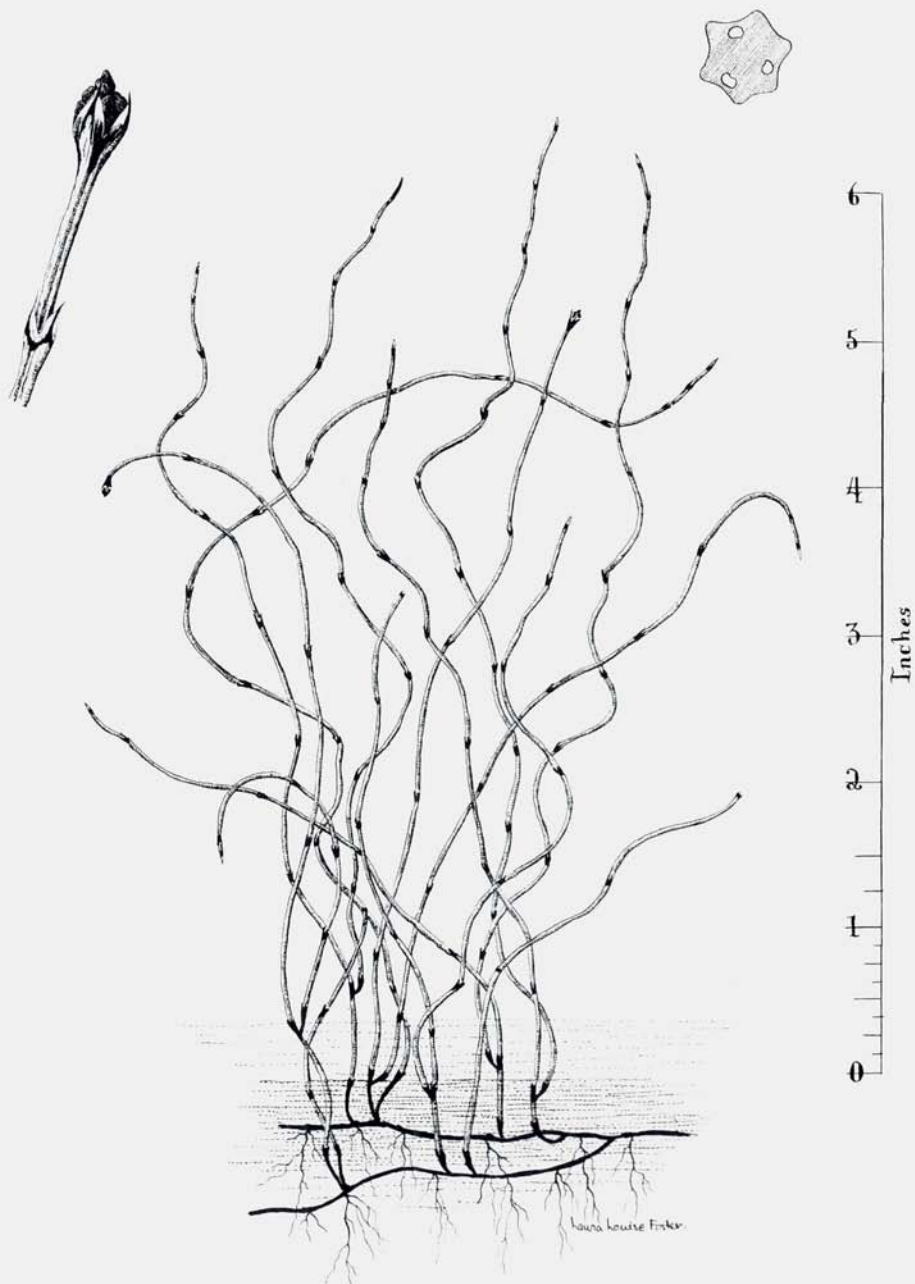
The more attractive species are the feathery branched Wood Horsetail (*Equisetum sylvaticum*) and the Dwarf Scouring Rush (*Equisetum scirpoides*). Cobb's *Field Guide to the Ferns and Their Allies* describes Wood Horsetail as the "Loveliest of our fern allies and a truly elegant plant. Emerald-green, with delicate lacy branches...in well-spaced horizontal whorls, spreading outward and gracefully drooping downward; usually grows as solitary, though closely spaced, little tree." It is found in wet meadows and swamps in rich moist soil and grows about eighteen inches tall.

Dwarf Scouring Rush, only about six inches tall, is the smallest of the species. It grows in the cool forests and on tundra of the northern United States, Canada and Alaska in rich moist woods or in tangled mats along mossy stream banks. It looks like horsehair.

Less desirable as garden plants are the Swamp Horsetail (*E. fluviatile*), Shore Horsetail (*E. litorale*), Marsh Horsetail (*E. palustre*), Meadow Horsetail (*E. pratense*), Smooth Scouring Rush (*E. laevigatum*), Common Scouring Rush (*E. hiemale*), and Variegated Scouring Rush (*E. variegatum*).

Several members of the Connecticut Chapter of the American Rock Garden Society, when queried about growing conditions, recommended planting all horsetails in containers to limit their invasiveness, and in secluded garden locations.* (See note at end of article.)

British gardener Gertrude Jekyll planted giant horsetail in a naturalistic pond setting mixed with flowering rush and sweet-sedge. She wrote, "Nothing is more strikingly beautiful than a large patch of *Equisetum telmateia*, a native



Equisetum scirpoides

plant, mysterious, graceful, and almost tropical-looking.”

Sears, Becker, and Poetker praise flower arrangements of horsetail with *Oenothera missouriensis*, the Missouri Primrose. The contrast of the linear reed-like horsetail with the soft rounded form of the yellow primrose makes an attractive combination.

The nodes of horsetail stems contain silica deposits making them rough and abrasive. They are called scouring rush because colonists used the cones and bristle-like branches to scrub metal dishes and pots, especially pewterware, while the rough stems were used as a kind of sandpaper in cabinetmaking. Present day campers who forget their scouring pads in the wilderness, can still use horsetails to clean their utensils.

A few herbal and medicinal uses for horsetail have been recorded. Swamp Horsetail was used as a mild diuretic. The crushed stems of other species were

used as a styptic or astringent. Combined with other plants in an infusion, horsetail was used to relieve dropsy and kidney ailments. When crushed and boiled in water, the horsetail decoction was believed to promote menstrual discharge.

Today, horsetail serves no economic purpose, but delights the woodland wanderer and rock gardener who cultivate this tiny relative of the giant Calamites as a means of touching base with the ancient lineage of earth's flora. §

**As one who has spent many years trying to get rid of E. arvense (unsuccessfully) and E. hiemale (successfully) by pulling up every sprig of top growth as soon as it appears above ground, I suggest planting all equisetums in deep tubs with very tiny holes in the bottom sunk in the soil to their rims to prevent the escape of the deep delving underground rhizomes. An exception might be E. scirpoides which in our garden has remained a small clump where planted for three years. — Ed.*

• • • *of Cabbages and Kings* • • •

The time is fast approaching when we are going to have to think in centimeters, meters and kilometers instead of inches, feet, yards and miles, and in Celsius instead of Fahrenheit. We in the United States are at odds with most of the rest of the world when it comes to mensuration as any scientist or master mechanic will tell you. Even my most recent cookbook gives liters and kilograms alongside cups and pounds in its recipes and already many of our authors in the Bulletin give measurements in millimeters and centimeters when writing about the width of a petal or the height of a stem. And

frankly, I am getting tired of transposing such measurements for you.

I am not going to give you a set of tables with equivalent measurements and temperatures, or mathematical formulae for conversion; these are not difficult to find in a well stocked stationery store, where you can also buy metric measuring rules, and most good hardware stores carry Celsius/Fahrenheit thermometers these days. Besides, in many ways, you will find it easier to think metric, not by trying to convert centimeters into inches, or degrees Celsius into degrees Fahrenheit, but to *visualize* the

length of a centimeter and *feel* the temperature in degrees Celsius. I will, however, give you a few hints as to how to start.

Most of us have a mental image of an inch, a foot and a yard, though in my case, if I check my estimated foot against a ruler, I find it is closer to 10 inches than 12. Hold your thumb and forefinger an inch apart. If you check that distance against a ruler you are probably a bit off, but no matter. That mental inch is equivalent to 2½ centimeters (25 millimeters). Now hold your two forefingers 4 inches apart. You are measuring off a mental 10 centimeters. Your mental foot is 30 centimeters long and your estimated yard is a little short of 1 meter. With a little practice you will find you can visualize (with the same accuracy as you visualize an inch or a foot) a centimeter or 10. If you need to be precise in either inches or centimeters you'll probably have to resort to a measuring rule anyway.

If someone gives me the height of a mountain in either feet or meters it doesn't mean much to me except that I know from experience that I begin to feel the altitude at about 8,000 feet. I'll just have to remember that 2,500 meters is about my personal limit of comfort at high altitudes and from this point up I'll

have to take it easy. As I've never been able to look at a field and estimate its size in acres, I might as well try to figure the space in hectares; I'll be equally wrong either way. As for kilometers, we have always measured our trips in minutes, hours or days, so it matters little if we go 90 miles or 144 kilometers. Either way, it will take us about 2½ to 3 hours, depending on the traffic and the driving conditions.

As you all know, I'm sure, water freezes at 0°C. and, at sea level, boils at 100°C. Ten degrees Celsius is a pleasant day in early spring provided there isn't a strong wind out of the northwest. At 20°C. you really won't need a sweater unless you are in the shade and a breeze is blowing. At 30°C. it's uncomfortably hot, particularly if the humidity is high, and at 40°C. you should stay in the shade, preferably up to your chin in cool water. Most gardeners like to work at temperatures somewhere between 10°C. and 25°C. if they have a choice, which they frequently don't.

So start to feel temperatures and see space in the metric system. It really isn't hard once you start to do it and think how much easier it is to transpose centimeters into meters than it is to change 298 inches into feet or yards. Try it, you'll like it, once you get used to it. §

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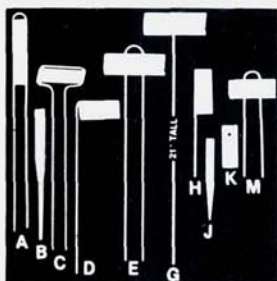
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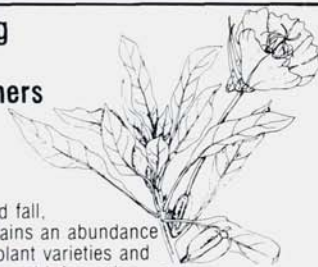
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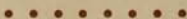
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