

ROCK GARDEN



QUARTERLY

VOLUME 53 NUMBER 2

SPRING 1995

COVER: *Iris reticulata* with *Lycaeides melissa*

by Cindy Nelson-Nold of Lakewood, Colorado

All Material Copyright © 1995 North American Rock Garden Society

ROCK GARDEN

QUARTERLY

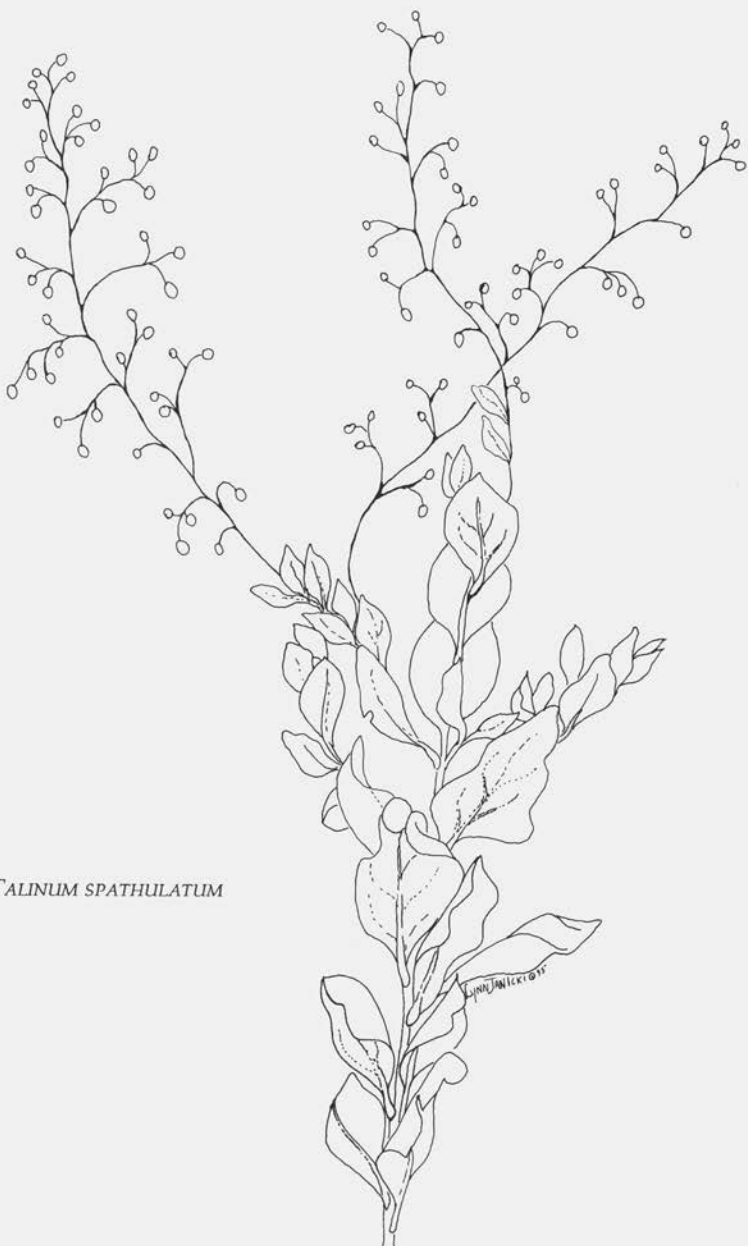
BULLETIN OF THE NORTH AMERICAN ROCK GARDEN SOCIETY
formerly Bulletin of the American Rock Garden Society
VOLUME 53 NUMBER 2 SPRING 1995

FEATURES

- Fameflowers: The Genus *Talinum*, by David Ferguson 83
- Flag Patio Gone Awry: Accidentally a Rock Garden,
by Marcia Tatroe 101
- Westerners Go East: Getting Started, by James L. Jones 107
- Heucheras: A Few Good Choices, by Grahame Ware 113
- Year of the Hoop House: 1994 at Ft. Courage, by Ev Whittemore 127
- New Leaf Forms of *Hepatica nobilis*, by Severin Schlyter 135

DEPARTMENTS

- Plant Show 133
- Plant Portraits 145



TALINUM SPATHULATUM

FAMEFLOWERS

THE GENUS *TALINUM*

by David J. Ferguson

What is a "fameflower"? When I was a little guy, growing up in north-eastern Colorado and western Nebraska, there were two different fameflowers among the many kinds of cute little wildflowers that grew in gravelly spots. For me, at that time, small cushion plants and tiny succulents just didn't compare to all the cacti, yuccas, prickly poppies and other showy-flowered, spiny wonders all around. Nor were fameflowers nearly so interesting for me as any of the abundant creepy-crawly critters.

I did, however, at least recognize that fameflowers existed, and one day in 1988 near Clines Corners, New Mexico, my eyes were opened to their charms. On a trip with Sean Hogan, I collected a few specimens to "play with." Next thing I knew, I was in love. Since then I've indulged my infatuation and have learned a great deal about these neglected plants.

By the way, the two Great Plains fameflowers of my youth turned out to be *Talinum calycinum* (the "big," showy one) and *Talinum confertiflorum* (the "delicate" one, covered in small, pale pink stars). It was also *Talinum confertiflorum* which grew at Clines

Corners. Perhaps the challenge of figuring out just what plants I had collected was part of what hooked me. I should mention that the *Talinum calycinum* is really quite small, to 6" tall, just large by comparison. Both species withstand -40°F to 120°F, hardly delicate, yet delicate in appearance.

Oh, almost forgot, a fameflower, is, of course, a *Talinum*; well, at least that's part of the story. The real fameflowers are only some species of the genus *Talinum*, a group of small, cute, little plants with tufts of succulent, cylindrical leaves, producing rather showy flowers. The other talinums are quite different indeed.

The talinums are members of the family Portulacaceae. The family as a whole has generally received very little attention from either botanists or horticulturalists; there has long been a limited interest in a few species of a few genera, especially *Portulaca* itself. Many Portulacaceae have been used locally as herbs or vegetables, but this use has not received much attention either.

Most of us know the many ornamental cultivars of *Portulaca grandiflora* (mossrose) and *Portulaca umbraticula*

var. *lanceolata* (purslane). Many have grown *Lewisia cotyledon*, *Calandrinia ciliata* (red maids), or even *Calyptridium umbellatum* (pussypaws). Of course, most of us have also unwillingly grown one or more of the weedy purslanes (*Portulaca oleracea* or *P. retusa*)—if you can't eliminate them, by the way, you can eat them, as they are nice pot herbs.

There are a few regional wildflower favorites in the family as well. Perhaps most are familiar with spring beauties (*Claytonia caroliniana*, *C. lanceolata*, *C. rosea*, *C. virginica*, etc.), to be seen in early spring in woodlands through much of the U.S. In the western U.S., several species of *Lewisia* (bitterroot) are widespread. The Portulacaceae are a family of roughly 30 genera and hundreds of species, so, of course, the list above is but a meager representation.

It seems odd to me now that talinums are so little known, being found over such a large area of the country, often very near to, or even within, large population centers. Perhaps this is due to the fact that most species favor shallow soils of rocky ledges, where few people venture. Those species that are most abundant tend to be considered more as weeds than as wildflowers, as they are leafy and mostly have inconspicuous flowers (e.g., *Talinum paniculatum*, *T. spathulatum*, *T. triangulare* [= *T. fruticosum*], and kin).

To many who actually do know them, the species included under the name *Talinum* have often gotten an undeservedly bad name. A few weedy species are considered pests by those growing them unbidden in greenhouses. The reputation is unfortunate, as many other species are quite attractive and well worth growing. The one species that is truly popular with collectors of succulents (though still rare in cultivation) is "*Talinum guadalupense*," not a *Talinum* at all, but a species

of *Cistanthe*, related to *Cistanthe grandiflora* (itself usually called a *Calandrinia*). *Cistanthe* is a close relative of the lewisias.

The genus *Talinum*, as it is now recognized, contains two very different groups of plants. All are perennials with the traits of the family—succulent leaves, bisexual flowers, two sepals, usually 5 petals, a capsular fruit, and thick to tuberous roots. Beyond these characteristics, the two groups are quite different.

Talinum

The genus *Talinum* was described in 1763 by Micheal Adanson, and its type species is *Portulaca fruticosa* Linnaeus. This plant is better known by the synonymous name *T. triangulare*. *Talinum fruticosum* (the correct name to use now) is the most notorious of the leafy *Talinum* weeds.

The true talinums are leafy perennials with fleshy stems arising from a perennial base or underground tuber. These plants have flattened leaves with a strong midrib. The 5-petaled flowers vary from 0.6 to 2.5 cm. in diameter and may be yellow, orange, red, magenta, pink, white, or combinations of these. The fruits are round, leathery balls that hang pendant from the stems, splitting and disintegrating, sometimes explosively, when mature. To this group belong all the weeds; however, some of them are quite ornamental and worth growing for their lovely, large flowers, attractive foliage, or large, ornamental tubers. They may even be grown as root vegetables or salad greens! I happen to like them all, but I am in the minority when the vote is taken on several species.

The true talinums occur naturally in semi-arid and tropical regions of southern Africa and the Americas, reaching as far north as the southern

United States. A few are widely naturalized in tropical regions elsewhere. They segregate nicely into three subgroups.

Subgenus *Helianthemoides* Section
Chromanthum

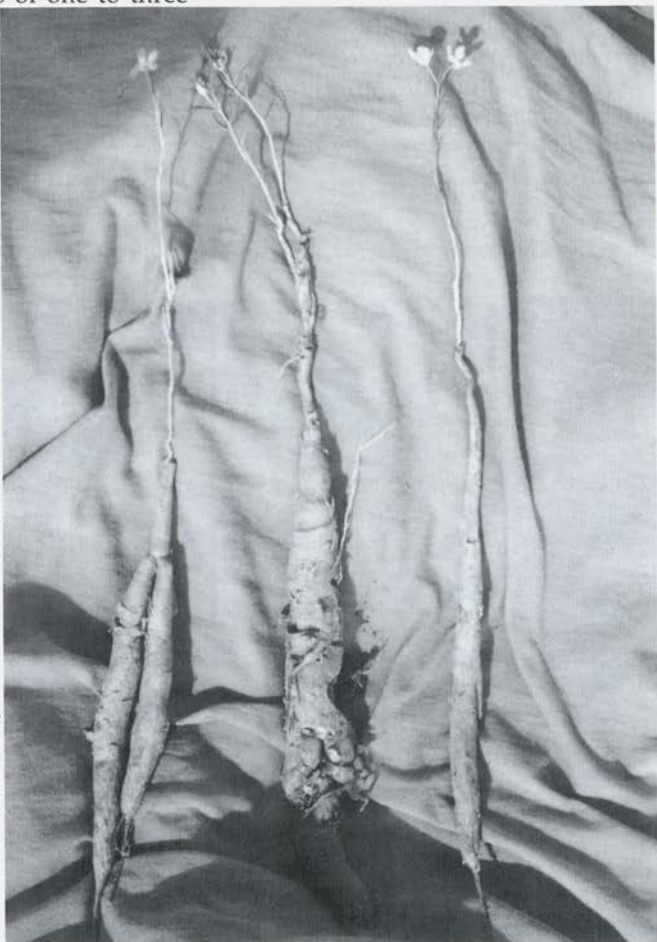
Subgenus *Helianthemoides* Section *Chromanthum*, containing most of the species, occurs in semi-arid regions of southern South America, southwestern North America, and Africa. All species have relatively large, starchy root-tubers. They tend to have narrow leaves on stems which lean sideways, and most have large flowers in small, axillary inflorescences of one to three flowers each (the African *T. portulacifolium* has a terminal raceme or panicle). The fruits are pendent and do not explode. These species have large root-tubers and are often dug as food.

In the southwestern U.S., these are usually called flameflowers, as the most common flower colors here are yellow, orange, and red. This is an adulteration of fameflower (I prefer to apply the latter name to the *Pthemanthus* types discussed below). Perhaps someone seeing the hot colors of these species thought that "fame" was a misprint for "flame," and others followed suit. As fameflower has moved in application to the leafy tal-

inums (slightly altered to flameflower) by association in the same genus with the real fameflowers, so has the name flameflower occasionally found its way back. In Africa, these species are simply called 'Ystervarkwortel' and 'Butterweed'.

The North American flameflower species are *Talinum angustissimum* (yellow flowers), *T. aurantiacum* (orange to red flowers), *T. cybosepalum* (orange flowers), *T. lineare* (yellow to orange flowers), *T. tuberosum* (orange flowers), and *T. whitei* (yellow to deep orange flowers), and *T. sp.* "with vari-

TALINUM ANGUSTISSIMUM



ably colored flowers" (yellow, orange, pink, to magenta; a new species, soon to be validly published). All five African species of *Talinum* are of this group, and three are known in South America, plus there are probably a few more in North America.

The three South American species (*T. sp.* [another botanically undescribed species, photo, p. 123], *T. chromanthus*, and *T. polygaloides*) plus *T. angustissimum* are unique among talinums in possessing woody stems. These form a close knit subgroup, all with yellow flowers, but those of the South American species may fade to orange or red in age.

The African species are *T. arnotii*, *T. caffrum*, *T. crispicrinium*, and *T. tenuissimum* (all yellow-flowered), and *T. portulacifolium* (white to magenta flowers). *Talinum crispicrinium* has very attractive foliage.

Subgenus *Helianthemoides*

A second group (Subgenus *Helianthemoides*) has species with blackish, branched root-tubers, spatulate leaves, and a terminal panicle of tiny flowers in pink, white, or yellow. The fruit valves split into inner and outer layers. When ripe the outer layer usually falls, leaving the inner layer as a translucent basket netted by veins. This group includes *T. nocturnum* (Paraguay), *T. paniculatum* (Caribbean-Atlantic tropics, widely introduced elsewhere), *T. sp.* "of the Sonora" (also to be described soon; mostly west of Continental Divide, U.S. and Mexico), *T. spathulatum* (continental from U.S. to Argentina), and perhaps a few more. Species of this group are often cultivated as herbs or vegetables. Species of this group are often called wild, pink, or yellow baby's-breath in the southern U.S.

LEFT, *TALINUM AFF. SPATHULATUM*; CENTER, *T. POLYGALOIDES*; RIGHT, *T. EYERDAMII*



Talinums of Subg. *Helianthemoides* are often confused with the rockroses (*Helianthemum* spp.; family Cistaceae), which many resemble rather closely.

Subgenus *Talinum*

The third group (Subgenus *Talinum*) has mostly obovate leaves and a terminal cyme of flowers with a spathe that is triangular in cross section. Its species are distinguished by a type of pollen unique in the genus, and their fruits explode at maturity (scattering them nicely about greenhouses). The best known species is *T. reflexum*, a weedy, white- or pink-flowered herb. There are several close relatives whose taxonomy is quite confused. Some are quite nice. *Talinum eyerdamii* (photo, p. 118, perhaps better called *T. linomimeta*) and *T. paraguayense* (photo, p. 123) from South America are rather small in habit but have large, showy pink to magenta and peachy-yellow flowers, respectively. Both make large root-tubers. *Talinum attenuatum* (also named *T. confusum* and *T. diffusum*) from tropical Mexico to northern South America bears many small, white-to-pink flowers on low, semi-shrubby, but not particularly woody, plants that lack root tubers. These make attractive bonsai-type specimens.

In Argentina and Mexico I have heard several vernacular names for *Talinum*, most beginning with *yerba*, especially *yerba sapo*. In Mexico one often hears *rama de sapo*.

We have devoted enough space to the "true" talinums for now and shall not consider this group further, except to say that for the rock garden-er who lives where the soil freezes, none of these species is suitable. Several could be used in rockeries in milder parts of Zone 7 and warmer. A few species are illustrated to give an idea of their appearance.

Phemeranthus

The second group for which the name *Talinum* is usually used is actually made up of species which should be included in the segregate genus *Phemeranthus*. These species are particularly known by the common name fameflower (occasionally adulterated to flameflower, as mentioned above). I have been unable to learn the true meaning of this name; however, it has been said it is linked to the fleeting nature of fame and of the flowers. These plants stage their flower show at the same hour every day, with flowers open for only a brief appearance. Other common names include flower-of-the-hour, rock or sand pink, moss pink, and moss rose. I'm quite sure there are other vernacular names. For example, many species grow in Mexico, but as yet I have learned no Spanish name for plants of this group.

The species of *Phemeranthus* are all characterized by a rather compact, dwarf habit. They have succulent, cylindrical leaves, roughly from 1 cm. to 5 cm. long, usually on very short stems. The flowers are usually borne on slender cymes, but may be solitary. They are typically five-petalled but may vary up to nine petals per flower. The flowers may be tiny, only 6 mm. across, or may be up to 3 cm. across and very showy. Those with small flowers tend to produce showers of dozens of little stars, while large-flowered species typically produce only one or few blooms at a time per inflorescence. The flower color may be yellow, white, pink, or magenta. Most species bloom over a long season as long as conditions are favorable, the flowers opening at the same time every day but remaining open for only an hour or two (thus the name *Phemeranthus*: brief-flowered).

The papery fruits are roughly football-shaped, ripen quickly, and are

usually held upright. They may split to form a three-parted basket or may simply fall apart when disturbed.

The small, disk-shaped, dark seeds are characteristic, and they have a papery translucent aril covering them, often giving them a gray or bluish appearance. This trait is not known in any other group of Portulacaceae (*Anacampseros* and related genera have a similar covering, but derived from the seed surface, not true arils).

The various species all grow where winters are freezing (though some places are really quite mild) and range across the United States from the Appalachian Piedmont to the Colorado River drainage. Two species grow in the Northwest, and one (*Talinum sediforme*) enters Canada in British Columbia. The group ranges southward in the higher mountains of Mexico to Puebla. One species (*Talinum punae*) even occurs in the high Andes in northwestern Argentina and adjacent Bolivia; it is a close relative of some of the Mexican species.

Phemeranthus was the generic name given by Samuel Rafinesque to the species *teretifolius*, when he first named it in 1808. As seemed to be his lot, nobody paid much attention to Rafinesque's opinion, and Frederick Traugott Pursh, in January of 1814, transferred the species epithet *teretifolius* to *Talinum*.

In 1814 all known specimens of this group of species were referred to *Talinum teretifolium*. This treatment continued until 1828, when the white-flowering species *Talinum napiforme* was described from near Mexico City by Augustin Pyramus de Candolle. In 1933, when Rafinesque became aware of this species, it was placed into *Phemeranthus* by him. Strangely, as I understand events, in the same publication he described the genus *Eutmon* and used *T. napiforme* as the type

species of that new genus. To sum up this little bit of *Phemeranthus* history, no species described since 1933 has been referred to the genus *Phemeranthus*. All have been placed, however inappropriately, within *Talinum*. In a future publication I plan to refer the dwarf species of this alliance back to *Phemeranthus*.

There is, in addition, another generic name, published by Julius Aloysius Arthur Nieuwland in 1915, which uses *Talinum parviflorum* as the type species. The name *Litanum* should be regarded as a synonym of *Phemeranthus*, as their type species are very closely related. (*Talinum teretifolium* is a stable, natural, polyploid hybrid, *T. parviflorum* being one of its parents and *T. mengesii* the other.)

Eutmon is a generic synonym of *Phemeranthus* as well; however, I regard it as a section or subgenus within *Phemeranthus*, as the type species of *Eutmon* belongs to a group quite distinctive from *P. teretifolius* and *T. parviflorum*.

Enough nomenclatural history for now. It will not be long until all these species are officially placed into the genus *Phemeranthus*, and the formal taxonomy is in place. However, since most species are not yet legally placed there, and since they are currently well known as talinums, I will bite the bullet and, for now, refer to them as *Talinum* species. Mind you, I'd prefer otherwise. *Phemeranthus* is a nice name, and such distinctive little plants deserve recognition as separate from their rangier cousins.

These compact plants may be grouped quite nicely into two groups—well, it's almost a tidy division. Of course, there always must be an oddball, in this case *Talinum longipes*, which does not quite fit into either group.

The *Eutmon* Group

A mostly southern group (the section typified by *Eutmon*) includes species with thickened, underground tubers. The tuber is usually rounded and has a surface which peels in layers. The stems are very short and not noticeable. Leaves appear to grow in a cluster directly from the top of the tuber or from a neck at the top of the tuber. The flowers of these species are not large, never much over 1 cm. in diameter, and appear like five-petaled white or yellow stars. The fruits do not split when ripe and eventually fall apart when disturbed. The seeds are sculptured with concentric, raised lines, sometimes hidden by the aril.

These are mostly Mexican species, two (*T. humile*, photo, p. 124, and *T. parvulus*, photo p. 124) entering the U.S. The South American *T. punae* (photo, p. 123) also belongs here. All favor substrates of volcanic origin, usually rhyolite, but grow nicely on granite as well. Most grow in very shallow, gravelly, clay soils on rock benches. *Talinum humile* and *T. palmeri* are less discriminating and may spread into flat grasslands adjacent to the rock outcrops.

In some places in Durango and Chihuahua up to three species may be found growing together. The occurrence of hybridization, as yet undocumented, should not be ruled out.

Of the yellow-flowering species, *T. multiflorum*, *T. parvulum* [= *T. marginatum*], and *T. punae* are truly tiny, with leaves mostly 1 to 2 cm. long. Flowers are mostly about 7-8 mm. across and are borne on crowded inflorescences little longer than the leaves. *Talinum parvulum* has a narrow neck at the leaf base, often under the soil, reminiscent of a petiole.

These species are untested for cold hardiness and may not survive beyond USDA Zone 7 or 8. They grow

at very high elevations, but at rather low latitudes. In nature they rarely experience hot days—but seem to tolerate them well. They are all easy to grow; however, they are very prone to rot. They thrive best in shallow pans with mineral soil (but not sand). They will handle considerable amounts of water when growing, if in good growing conditions, but should be kept on the dry side when dormant. I have seen *T. parvulum* growing submerged in water. Of course, this is a very temporary condition, the soil being well-drained and on the dry side for most of the year.

All three make nice pot plants that will often become somewhat larger under cultivation than in nature, their short inflorescences lengthening almost indeterminately and producing dozens of flowers.

The remaining *Eutmon*-type species are rather larger and have slightly larger flowers. They are equally untested for hardiness.

Talinum greenmannii should be hardy into Zone 7 or colder. A native of Mexico as well, but from colder places, it occurs on steep, cobble slopes in pine forests. It has rather chunky, rich green leaves to 4 cm. long (sometimes lobed) and bears its yellow flowers nestled among the leaf bases. It is quite charming and rarely goes unnoticed by visitors to my greenhouses. I have found it in Chihuahua, but it also has been attributed to high mountains near Mexico City, so it seems to have a rather wide distribution.

Talinum humile is the most northern and the largest of the yellow-flowered species (photo, p. 124). Its rather dull green leaves reach 5 cm. long, and these sometimes turn purplish. The flowers are borne on stout inflorescences about double the length of the leaves and tend to spread sideways. The flowers are usually about 1 cm. in

diameter. *Talinum humile* occurs from northern Chihuahua and northeastern Sonora well up into southeastern Arizona and southwestern New Mexico. It is hardy in Zone 7 and probably in Zone 6.

Talinum humile is perhaps the most difficult of all the species to cultivate. This is due to its habit of not growing until temperatures are quite high. It may be forced to grow if watered liberally in early spring; however, the usual result of this is rotted tubers. It is best to keep this species decidedly on the dry side through early spring. Slight moisture is needed, but very slight. It will show activity very quickly if watered heavily in May or June and will then handle considerable watering until August or September, when it will wish to sleep again. This and *T. calycinum* are the species with the shortest growing seasons known.

The white-flowered *Eutmon* species are two. One, *T. napiforme* (photo, p. 124), comes from south of the Chihuahua Desert and is rather like *T. humile*. However, it has more slender and more upright inflorescences. The other, *T. palmeri*, produces gray-green leaves which tend to curve inward and then up, giving an attractive look to the plant. The flowers are about 1.5 cm. across and held on slender, upright inflorescences to 30 cm. tall.

Talinum napiforme is a very easy plant, reseeding liberally. It seems able to handle considerable freezing above 15°F, but seems not hardy in Albuquerque in Zone 7.

Talinum palmeri will probably prove to be culturally similar to *T. humile*; however, I have obtained plants only recently and have not yet learned much about it.

Talinum longipes has the seeds and tuber (although the tuber is narrow) of the *Eutmon* group, but has a slender, perennial, above-ground stem and bas-

ket-fruits as in the *Phemeranthus* subgroup. The flowers are tiny and pale pinkish with magenta stamens. *Talinum longipes* grows on limy soils (also unusual for the *Eutmon* group) from north-central New Mexico across Trans-Pecos Texas into northern Chihuahua. It is hardy to Zone 6 (perhaps 5) but is more of a curiosity than an attraction. Its flowers open later than in any other species, just before sunset. *Talinum longipes* probably will be placed in a section of its own some day.

The *Phemeranthus* Group

The next group is Section *Phemeranthus*, most of whose species occur in the United States. *Talinum mexicanum* (from San Luis Potosi) and *T. oligospermum* (from Puebla) are both Mexican and apparently of this section. I have seen neither as yet. Both are rumored to have small, yellow flowers (otherwise unknown in this part of the genus).

The *Phemeranthus*-type species are diverse, but all grow stems long enough to be visible. Sometimes the part of the plant above ground is wholly annual. They tend to have thickened roots, but not the rounded tubers of the *Eutmon* group. The fruit of all except *Talinum parviflorum* split open to form a papery basket when ripe. The seeds are nearly smooth, without the concentric ridges of the *Eutmon* group. These species seem to hybridize rather freely with one another if given opportunity, but the hybrids seem mostly to be sterile.

The species of the eastern U.S. are rather confusing, and surprisingly, some are not even yet named. These produce upright, fleshy stems crowded with terete leaves roughly 2-5 cm. long. The inflorescences are slender-stemmed, upright cymes.

Most have magenta flowers roughly 1.5-2.5 cm. across with numerous sta-

mens. These larger-flowered types are *T. calcaricum* (from limy-soiled pine barrens in Tennessee), *T. calycinum* (actually western, from sandy places on the Great Plains), *T. mengesii* (from Alabama and Georgia, not on lime), *T. rugospermum* (= *T. ciliatum*; from sand in the Midwest), *T. teretifolium* (from the Appalachians, not on lime, but sometimes on serpentine), and two additional species yet to be named.

Talinum calycinum has been confused with an eastern species and is closely related to the various eastern species; however, it occurs on the Great Plains like *T. confertiflorum* and is actually not eastern in its distribution at all. It is discussed here for comparison's sake.

Talinum calycinum has the largest flowers (to 3 cm. across) and the most stamens, approximately 45 per flower. Unlike its close relatives, these flowers are fragrant (somewhat chocolatey, nice for a chocolaholic like me). *Talinum rugospermum* and *T. teretifolium* have the smallest flowers and about 20-25 stamens. *Talinum calcaricum* and *T. mengesii* have flowers about 2 cm. across with about 30 stamens. *Talinum mengesii* and *T. teretifolium* have sepals which do not drop until the fruit ripens, while the others have sepals that fall off shortly after pollination. *Talinum teretifolium* may be closely akin to the *T. brevicaule* group but does not look much like those species.

Talinum calycinum and *T. rugospermum* have a thickened vertical root buried under the surface, and perennating buds form below ground. *Talinum calcaricum*, *T. mengesii*, and *T. teretifolium* grow rhizome-like structures at the soil surface, with perennating buds forming above the soil.

Talinum rugospermum gets its name from the slightly wrinkled aril of the seed; all the other species have smooth arils. The seeds of *T. mengesii* tend to

appear black, while the aril makes the seeds of the rest appear grayish.

The two unnamed species are very similar to the five above. One of these grows in the Ozark region (Arkansas, Illinois, Kansas, Missouri, Oklahoma) mostly not on lime. It is grossly similar to *T. calcaricum*. This plant is now commonly cultivated as a rock garden plant and is incorrectly sold as "*T. calycinum*." (photo, p. 120). I have proposed that the new species epithet honor the Ozark region and expect that the species will be officially named soon.

The second species is quite similar to *T. mengesii* but tends to grow like a creeping devil, rooting and making little potato-like root tubers as it goes, dying back at the original end. This plant comes from the Ouachita Mountains in Arkansas. It will be described soon as well, likely as a commemorative for Stewart Ware of Williamsburg, Virginia, who first noticed the distinctness of the plant.

There is yet one more eastern species, *T. parviflorum* (= *T. appalachianum* and *Claytonia nuttalliana*). It occurs widely from the east side of the Great Plains and central Texas east to Alabama. This small species has an upright stem, connected to a slightly thickened, vertical root. The flowers are only about 1 cm. across with only 5-10 stamens and are white, pink, or magenta. This is an easy-to-grow species, doesn't like lime, and flowers profusely, creating impressive displays for its small size.

Of these eastern species, I have as yet seen only herbarium material of *T. calcaricum* and *T. rugospermum*, so my understanding of these is still rather poor. The other species are all of rather easy culture, growing in most any soil. They prefer cramped spaces, such as pockets in a rockery, or a small or very shallow pot. If happy, they will reseed

themselves liberally. To some, this is a liability, but to me it is an asset. The unwanted ones wouldn't be hard to remove—but who in their right mind would want to remove any?

All seem hardy into Zone 5; however, *T. rugospermum* and the northern *T. parviflorum* should be hardy well beyond this, probably into Zone 3.

Now we move west to the Great Plains and beyond. One species, *T. confertiflorum* (= *T. gracile*, *T. goodingii*, and *T. rosei*), perhaps the most common and widespread of all, is very similar to *T. parviflorum*. It differs in having twice the chromosome number and in having only white to pink flowers. Unlike *T. parviflorum*, the sepals remain on the fruit, and the fruits split open at maturity. It is quite variable, and numerous forms could be named based on size, habit, and coloration of the plant.

The distribution of *T. confertiflorum* is from central Chihuahua and north-eastern Sonora in Mexico to central Utah, Wyoming, and North Dakota, eastward into western Texas, Oklahoma, Kansas, and Nebraska. This means that one form or another should be happy outdoors nearly everywhere in the U.S. and perhaps well into Canada and Mexico.

The species survives in a wide range of habitats from near desert to montane forest. It grows almost anywhere non-lime rock or gravel forms shallow soil pockets and may even grow in gravel patches on sand dunes. It has been found on limestone in the Zuni Mountains in New Mexico, but nowhere else. There it grows with *T. brevicaule*, and hybrids are suspected—but not seen in flower yet.

In Sandoval County, New Mexico, another odd colony occurs on limy sandstone slabs, where it favors more organic spots in soil pockets. Growing

with it, in more mineral spots, is *T. longipes*. That the two co-occur is a unique situation. They are very similar looking and are confusing if not observed closely. No hybrids have been found, but they would be hard to spot.

Observations made by Stephen Jankalski of Baltimore, Maryland, show that greenhouse-produced hybrids of *T. confertiflorum* and *T. parviflorum* are sterile. This is a strong indication that they are truly distinct from one another.

As one may guess, *T. confertiflorum* is among the easiest of the easy to grow. It can reward you with hundreds of its little afternoon stars over the entire growing season if it is happy with its conditions.

Six of the seven remaining western species form a close-knit group with only one to few flowers per inflorescence. But what nice flowers they are! The stems arise from thick, branched rootstalks and spread outward instead of growing upright. The appearance, when not in flower, is that of a rather nice, compact *Sedum*. The stems die back to just below the soil surface in winter. *Talinum brevifolium* and relatives are, in my mind, the gems of the genus. All are hardy in Albuquerque, New Mexico (Zones 6 and 7), and several, if not all, should be hardy at least into Zone 4.

Species of this group have the interesting trait of producing smallish, female flowers among the normal, bisexual flowers. Occasional plants produce only female flowers (see photo of *T. brevifolium*, p. 119). All except *T. validulum* also have fragrant flowers.

When I first saw *T. brevicaule*, growing in the piñon-juniper woodlands of New Mexico, I was immediately impressed (photo, p. 118). I did not

know for some time what this little gem was, at first not even recognizing it as a *Talinum*.

Talinum brachypodium, *T. brevifolium*, and a third undescribed species are all very similar. They have blunt leaves and produce their flowers singly, only one flower on an inflorescence. The rounded petals are often as many as eight per flower. The sepals fall off the fruit early.

Talinum brachypodium has rich lavender-pink flowers about 2.5 cm. across and gray-green leaves (photo, p. 122). It favors limy soils and hails from central New Mexico, where it sometimes grows with *T. brevicaule*. *Talinum brevifolium* is similar but smaller, with white, pink, or magenta flowers about 1.5-2 cm. across (photo, p. 119, 120). It grows on fine-grained, non-limy sandstones in the Colorado Plateaus from the west edge of northern New Mexico to near the Grand Canyon in Arizona, and to central Utah.

The third, new species (photo p. 119), of Gila Conglomerate clays in southwest New Mexico, is unique in growing slender rhizomes which produce colonies up to 1 m. across of interconnected plants. It has magenta flowers 2.5 cm. in diameter and dark, glaucous, green, slightly flattened leaves.

The remaining three species of this group produce flowers in small cymes. *Talinum brevicaule* (= *T. eximium*, *T. pulchellum*, and *T. youngii*) grows on limy soils from New Mexico across west Texas to central Chihuahua, Mexico. It has pointed leaves and magenta (rarely white) flowers 2-2.5 cm. in diameter with pointed petals and mostly more than 20 stamens. The long, pointed sepals remain on the fruits until they are ripe. The inflorescences tend to spread laterally.

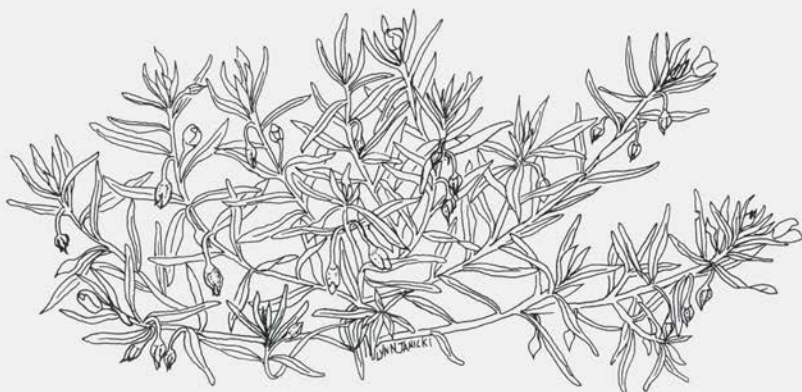
Talinum validulum (= *T. thompsonii*) is

very similar but has smaller (1.5 cm. wide) white to pink flowers which tend to be held more upright, above the leaves. These also like lime (but grow on other soils) and occur in nature from northwest Arizona to central Utah.

A pretty, wild hybrid between *T. validulum* and *T. confertiflorum* sometimes occurs. It is a much more vigorous grower than either parent, and flowers more profusely. The plants are sterile and thus must be propagated by cuttings. However, doubling the chromosome number might make it fertile, as in *T. teretifolium*. The latter is a natural hybrid, now become a good species; it is sterile if diploid, fertile if tetraploid.

Talinum sediforme (= *T. okanoganense*, *T. wayae*; photo, p. 120) is from north-central Washington and southern British Columbia, the only member of the genus known to occur north of the contiguous United States. It forms dense clumps of stems to 17 cm. across, with lots of 2-cm.-wide, white to pink flowers with bluntly pointed petals. The inflorescences spread laterally, holding the flowers roughly level with the leaves. This delightful species is becoming a favorite among some rock gardeners and should be tried by all.

One last species, and certainly one of the best, is *T. spinescens* (photo, p. 121), which comes from north-central Oregon and south-central Washington. It is almost a shrub, producing cushions of thickish, branched stems to 30 cm. across and 10 cm. tall. The old leaves tend to remain on the stem tips, giving a rather prickly appearance in the winter. Due to the winter rainfall climate of its home, this species has adapted to start growth earlier in spring than any of the rest and may be in flower as early as April in some gardens. It will re-bloom through the summer as rainfall allows. The flow-



TALINUM WHITEII

ers, light magenta, much like many of the eastern species, are about 2 cm. across. The shiny leaves tend to be short and chunky and often turn purplish-red when the plant is stressed. In milder climates they are sometimes evergreen, the red leaves hanging on through the winter.

A garden hybrid called 'Zoe', believed to be a cross of *T. sediforme* x *T. spinescens*, is commonly cultivated. I have not yet had the pleasure of growing it.

The fameflowers discussed above almost universally grow in very well-drained, sunny situations, typically in cracks of rock or in shallow pockets of soil or gravel on rock ledges. On occasion, they may be found on the gravelly crest of a hill or in a gravel patch in sandy areas. These habitat requirements should be remembered when

placing these plants in the garden. They do not care much for rich, open beds, often disappearing the first winter. They like an exposed situation in a pocket of soil where they are never wet. These are perfect plants for the alpine rock garden or a scree garden or a trough.

Most species are easy from seed. Those from the East seem to require a cold treatment to germinate (several weeks near freezing in the refrigerator will do it); those from the West mostly do not. A few species, notably *T. humile*, seem to require something more, perhaps aging, or a hot spell. The main thing to remember is that most germinate in spring or summer after thunderstorms in warm weather. This means warmth and alternating wet and dry seem to get them up best. Once they are up, they should never be wet, and they survive best if evenly moist for a month or two. After that

they may be treated as adults. They may even flower the first season.

When these plants go dormant, it can be a bit unnerving. They turn into yellow or orange mush, seemingly overnight. This usually happens with the first nights below about 40°F. Don't worry; just let them stay on the dry side until spring. In fact, you should try to harden them off by holding extra water for a month or so before the first freeze.

Of course, culture will vary with where you live. If you live where winters are constantly damp, you may find some species impossible. Others should survive if you pay special attention to drainage and maximum sunlight. If you're in the desert, you may need to water quite a lot in spring and summer, and even a little in win-

ter. Here in New Mexico some species may actually appreciate some light shade, as from a deciduous tree, for a few hours at midday.

Many species will thrive in much of Europe, southern Africa, New Zealand, and other temperate climates. In hot climates such as the Gulf Coast or the Sonora Desert, many of these plants will suffer, but some may even be happy there. All U.S. members of Section *Phemeranthus* likely have populations hardy into Zone 5, and several may be hardy into Zone 3 or 2.

Growing these plants is a new hobby, and we will all need to experiment for a while. They are wonderful little plants, and I hope you will all enjoy them as much as I do.

Availability

In the United States, plants of a few species are available from Siskiyou Rare Plant Nursery, 2825 Cummings Road, Medford, OR 97501, (503) 772-6846; \$2.00 for catalog.

Seeds of most species are available from Mesa Garden, P.O. Box 72, Belen, NM 87121, (505) 864-3131. To request an extensive seed listing, send \$1.00 (U.S.) or 3-32 cent stamps. Depending upon demand, a Portulacaceae-only listing is being considered for the near future.

Other suppliers of rock garden and alpine plants often offer seeds or plants of one or two species, but often on a short-term basis until the supply is sold out. Be careful, as in many cases (due to the lack of good literature on *Talinum*) these are mislabelled and may not be quite the one you ordered (though probably quite similar). I hope to begin propagating these plants myself for mail-order sales in the near future, but at present I only have a few individuals of each collection for botanical study and seed production.

Drawings by Lynn Janicki

David Ferguson lives in Albuquerque, New Mexico. He has long had a consuming interest in Cactaceae and has a business propagating and selling seed and plants of Agavaceae and Opuntoid cacti. He is also especially interested in butterflies and beetles.

"*Talinum* x 'Zoe'. Although it does not appear to have been recorded anywhere, this is a plant worthy of recognition. It almost certainly claims *T. okanoganense* as one parent and is of similar appearance, but larger in all its parts, although remaining a mat-forming plant. I believe it to have been raised by the late Mr. Peacock, an enthusiastic member of the Alpine Garden Society who named it for his wife."

—Will Ingwersen, *Manual of Alpine Plants*, 1987

"*Talinum spinescens*, an exceedingly showy relative of the *Lewisia*s from the Wenatchee Mountains of central Washington, sends out sprawling, branching, succulent stems ending in masses of linear leaves like long, fat fir needles. The rose-red blossoms, filled with a mass of bright yellow stamens, are carried in open panicles on naked stems of some five to six inches. In its native habitat the ends of the stems are covered with short spines which are nothing more than the persistent midribs of former leaves. In the wet winter climate of Portland these spines, too, disappear, leaving behind curiously naked-looking branches which call desert things to mind in some vague way. On the ends of these stems little red pimples appear in the spring, and these gradually expand themselves into clusters of slender succulent leaves which again decently clothe their nakedness."

—Ira N. Gabrielson, *Western American Alpines*, 1932

"*Talinum rugospermum* from the east central states, when uprooted from an unwanted position and thrown on the ground in a shaded place, has opened flowers for three days at the irregular late hour. These delicate-appearing plants of refined character and scale, all delightful in their afternoon abundance of bloom, continue from early summer to fall. ...

T. rugospermum prefers a sandy scree, thrives in its own close company, survives in the difficult climate where I live, and provides lovely color over a very long season."

—Claude Barr, *Jewels of the Plains*, 1983

"...the tiny ones for the rock garden are mostly from our plains states and are hardy if treated right. *Talinum*s require a sandy soil with perfect drainage, and a hot sunny situation. They will not stand water around their roots in winter. They are easily propagated from seed and, once established in a garden, will produce a never-ending supply of new plants from self-sown seeds. There are several species in addition to those listed, but they are seldom offered for sale because of their delicate nature. "

Walter A. Kolaga, *All About Rock Gardens and Plants*



Tatroe garden in late summer. Plants include johnny-jump-ups, erigerons, *Stachys lanata*.
photos, Randy Tatroe

In late summer. Plants include johnny-jump-ups, erigerons, *Stachys lanata*.





Oenothera caespitosa (p. 104))

photos, Randy Tatroe

Haplopappus spinosus (pp. 104, 106)





Nepeta phyllochlamys (pp. 104, 106)
Panayoti Kelaidis

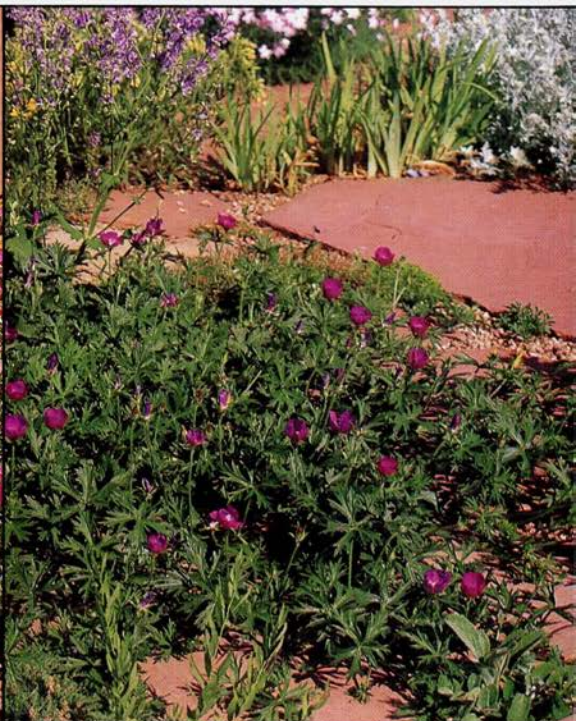


Penstemon fruticosus 'Lunsford Pink'
(pp. 104, 105) Randy Tatroe

Helianthemum sp., (p. 105) Randy Tatroe



Callirhoe involucrata (p. 104) Randy Tatroe





Tatroe Flagstone Garden In late summer. Plants include johnny-jump-ups, erigerons, *Stachys lanata*.
Randy Tatroe

FLAG PATIO GONE AWRY

ACCIDENTALLY A ROCK GARDEN

by Marcia Tatroe

When we moved into our home seven years ago, the front yard was a typically unimaginative suburban landscape consisting of lawn, a couple of trees, and borders of junipers mulched with several truckloads of red and black lava rock. We removed the junipers and a fireblight-ridden crabapple but left a badly placed ponderosa pine. It was, after all, the only thing green remaining in the whole yard aside from the bluegrass. The lawn was divided roughly into two levels by a low rock wall constructed of unmortared local sandstone. This is an odd style that is hopefully unique to the Denver area—it results in a maintenance headache that has few rivals. We decided to keep the wall but got rid of the grass between the wall and the house. This area against the north side of the house was to be my shade border (That was a bad idea as it turned out. I'd completely underestimated the strength of Colorado's early morning sunlight and the damage it does to hostas, ferns, etc.).

We also widened the existing borders around the remaining lawn and dug in various types of organic material along with all that unsightly rock

mulch, reasoning that it would make a respectable soil amendment. By this time we'd already built several berms for rock gardens in the back yard. The plan was to use the front exclusively for mixed borders, another of my many gardening passions. Initially, we planted dozens of shrubs and trees in this 40' x 40' area—and consequently, have had to take a dozen or so back out as we regained our senses! Empty landscapes inspire gardeners to this sort of madness.

For a few years we were content with the way things developed. But since nobody in our house is a lawn fancier, we soon tired of the thankless hours that even a small lawn demanded of us. We found ourselves looking around in earnest for a more rewarding alternative.

We decided to build a front courtyard, with flagstone paving replacing the lawn and the mixed border providing privacy from the street. Since the front of our house faces north, this side is a more comfortable place to sit on a summer's afternoon than our very hot brick terrace at the rear. We'd admired a friend's flagstone patio where woolly thyme almost entirely

obscures the stone, and we wanted ours to be somewhat similar—the look of a lawn without the water and fuss that grass requires. It was easy to imagine the heady aroma of thyme perfuming a warm summer evening as we enjoyed the borders, cool refreshments in hand. It didn't turn out that way—instead, our romantic courtyard evolved into yet another rock garden.

My non-gardening husband and son were pressed into service, and we commenced building in the summer of 1991. We chose red flagstone because it was the least costly of the handful of colors available locally. The rust-red clashes with almost every imaginable flower color but the trade-off is that the same hue contrasts attractively with the entire range of silver and green foliage tones. Thankfully, the flagstone has aged to a duller version of its overly bright original red—or is it because hundreds of plants now camouflage the color? Of course, flower color wasn't even a consideration at the time, because the stone was to be covered with thyme.

Flagstone comes in many thicknesses. We opted for the two-inch size, figuring that it would be sturdy enough for our purposes. At the stone yard, we looked for pallets that contained at least a few pieces that were several feet across. When the shipment was delivered and unpacked we were delighted to discover that quite a number of the stones bore the imprint of fossil ferns, an unexpected bonus.

Building our terrace was an easy weekend's work. We laid the stones directly onto our previously pampered bluegrass lawn. This prompted passersby to slow down and stare and not a few to stop and demand an explanation. We reasoned that in the heat of summer the stones would smother and rot the grass underneath (and we are happy to report that it

did). We left spaces of two to five inches between the stones to facilitate planting and weeding and then used a single application of glyphosate to kill any remaining exposed grass. (Several thicknesses of newspaper layered under the stones would kill the lawn just as effectively and eliminate entirely the need for an herbicide.)

Laying flagstone is like working a giant jigsaw puzzle. We placed the largest pieces first, positioned somewhat randomly throughout the terrace. We next laid the stones on the perimeter, leaving the edges quite uneven so that the flower borders would intrude onto the terrace at places and soften the margins. Then we placed the smaller stones, moving them around until we were pleased with their arrangement. Lastly, we filled all the joints with pink and gray pea gravel and built a bench in one corner with the same stone (these pieces were cut squared and four inches thick). The plan was to leave the terrace alone until the following spring as we wanted to be quite certain the lawn was dead before planting the thyme.

It was while that big space sat empty and inviting that the trouble started. It wasn't too long before I decided that what the terrace really needed was a few planting pockets to interrupt all that unrelieved flatness. So, I removed a few medium-sized stones and found much to my relief that the sod underneath was indeed dead. I filled those areas with lots of treasures from our local chapters' fall plant sale. When the snow melted in spring I was pleased to see everything had survived the winter well.

At this point our original idea still might have had a chance if it hadn't been for the arrival of our chapter's spring plant sale. At these events, I tend to buy one of everything and

then come home to wander around the garden wondering where I can possibly put it all. That spring I had two flats of new plants that needed a home, nowhere obvious to put them and a big, tempting expanse of stone and gravel. That's when the woolly thyme idea was abandoned entirely.

This wasn't an ideal site for a rock garden. When we amended the soil in the adjoining borders we discovered heavy, sticky clay of the type that makes great pottery. The dead sod did create about a six-inch layer of humus-enriched soil on top, and that does help considerably. The whole front yard is sloped gently toward the street, which also aids drainage. Another concern of ours was that the heat that the dark stone soaks up on a hot day—enough to blister bare feet!—would cook the plants. A lighter-colored, more effective stone might have been a better choice for our climate, but fortunately the northern orientation limits the number of hours that this side of our property really bakes, and it so hasn't been the problem we'd feared. On the plus side, this area has reliable snow cover most winters in the shadow of the house.

What is a pleasant surprise is how many plants accept these conditions and thrive, from alpines to desert species. In fact, quite a number of plants have had to be evicted because they were much too happy. Seedlings of plants that never re-seeded in the borders have come up by the hundreds in joints between the flagstone.

Placing the stones over live sod has been a real success despite a few of our early misgivings. It's unnerving to have any surface wobble underfoot so we were worried about some rocking that occurred the first summer. As the soil compacted and settled under the weight of the stones the unsteadiness

has disappeared. There has been some flaking of the stone surfaces but no piece has actually cracked. A real advantage dead sod has over the more traditional sand and gravel subsurface is that it's not as attractive to ants. Parts of the brick-on-sand patio in our backyard sink as much as two inches a year due to undermining by ants.

Weeds haven't been troublesome either. With the sod left undisturbed most of the weed seeds stay buried and ungerminated. Thyme leaf spurge (*Euphorbia maculata*) and annual grasses have been the worst offenders, but it isn't unpleasant to sit on the warm stones and pull these as they appear. However, if they were left to go to seed these and other weeds would very quickly become a nightmare of Hollywood proportions.

Our terrace needs little irrigation, which is good because dragging a hose across it does a lot of damage (we don't have an automatic sprinkler system). A few things have been beheaded and others chopped out entirely by the hose as effectively as if we'd used a hoe. The flagstone makes a good mulch and even when the stone gets really hot the soil underneath stays relatively cool and evenly moist.

The dry wall hasn't been so successful. The soil here dries out much too rapidly for most seedlings to easily establish themselves. Additionally, every summer we experience one or two really strong storms that drop several inches of rain in an hour or less. Whenever this occurs, all too predictably, whatever soil and plants there are in the crevices wash out. Only *Schivereckia podolica* and a few sempervivums have so far been willing to put up with this routine. So I've concentrated on plants that will cascade over the wall instead. *Artemisia* 'Silver Brocade', *Sedum* 'Vera Jameson', and *Origanum laevigatum*

Plants for a Hot, Flagstone Patio

- | | |
|---|--|
| <i>Acaena caesilauca</i> | <i>Penstemon caespitosus</i> 'Claude Barr' |
| <i>Antennaria carpathica</i> | <i>P. davidsonii</i> |
| <i>A. parvifolia</i> 'McClintock' | <i>P. fruticosus</i> 'Lunceford Pink' |
| <i>Aubrieta</i> sp. | <i>P. fruticosus</i> 'Waxworks' |
| <i>Amsonia jonesii</i> | <i>P. purpusii</i> |
| <i>Arenaria tetraquetra</i> | <i>P. virens</i> |
| <i>Aurinia montana</i> | <i>Phacelia campanularia</i> |
| <i>Bellium minutum</i> | <i>Phlox mesoleuca</i> |
| <i>Bolax glebaria</i> | <i>P. pulvinata</i> |
| <i>Calamintha nepeta</i> | <i>P. subulata</i> cultivars |
| <i>Callirhoe involucrata</i> | <i>Potentilla nevadensis</i> |
| <i>Campanula cochlearifolia</i> | <i>P. nitida</i> |
| <i>Chaenactis douglasii</i> | <i>Raoulia australis</i> |
| <i>Clematis hirsutissima</i> | <i>Salvia argentea</i> |
| <i>Crassula sediformis</i> | <i>S. jurisicii</i> |
| <i>C. setula</i> 'Curta' | <i>S. praetensis</i> |
| <i>Dianthus freynii</i> | <i>Saponaria oliviana</i> |
| <i>D. 'Luminitzeri'</i> | <i>Saxifraga cuneifolia</i> |
| <i>D. petraeus noeanus</i> | <i>S. 'MacNabiana'</i> |
| <i>D. 'Pikes Peak'</i> | <i>S. 'Mossy Red'</i> |
| <i>D. plumarius</i> 'Spotti' | <i>S. toyo-yatabusa</i> |
| <i>Dorycnium hirsutum</i> | <i>Scabiosa columbiana</i> 'Nana' |
| <i>Erinus alpinus</i> | <i>Schiverekia podolica</i> |
| <i>Erodium chamaedryoides</i> 'Roseum' | <i>Sedum pilosum</i> |
| <i>Euphorbia anacampseros</i> | <i>Sempervivum</i> varieties |
| <i>Genista pilosa</i> | <i>Sphaeromeria capitata</i> |
| <i>Haplopappus spinulosus</i> | <i>Stachys chrysantha</i> |
| <i>Helianthemum nummularium</i> | <i>S. thirkei</i> |
| <i>Helichrysum arenarium</i> | <i>Tanacetum niveum</i> |
| <i>Kniphofia uvaria</i> 'Primrose Beauty' | <i>Thymus neceferii</i> |
| <i>Linum bulgaricum</i> | <i>T. serphyllum</i> varieties |
| <i>Nepeta phyllochlamyis</i> | <i>Veronica tauricola</i> |
| <i>Oenothera caespitosa</i> | |
| <i>Onosma echioides</i> | |
| <i>Papaver rhoeas</i> 'Mother of Pearl' | |
| <i>Paronychia serpyllifolia</i> | |

'Hopley's Purple' all cheerfully accept the very dry, unstable soil behind the rocks, their striking foliage providing months of color and interest.

Many more plants prefer the north-facing shelter of the wall's base. *Penstemon fruticosus* varieties (photo, p. 99) placed here are not so apt to burn up in our intense winter sun. These penstemons always recover and bloom well in any case but their evergreen foliage helps the gardener maintain some optimism during the midwinter doldrums. I've had a devil of a time finding a spot in the garden acceptable to silver saxifrages. The rock garden berms in the backyard aren't sloped to the north steeply enough to prevent saxifrages from frying on a really hot day. Naturally these are my husband's favorite rock garden plants, and I despaired of ever successfully keeping them alive for him. But I've discovered that the foot of the wall offers the ideal combination of protection and bright light that these plants require. Likewise, mossy saxifrages and *Saxifraga toyo-yatabusa* do well here. Surprisingly, so does dryland *Phlox pulvinata*.

In planting the flagstone, I strive for a lot of texture by varying leaf form, size, and color, as well as giving some consideration to attractive color combinations. I like to arrange plants casually in loose clusters using uneven numbers and irregular spacings. To further soften the edges I generally pull one or two plants away from the others, allowing them to intermingle with adjacent plant groups.

Those plants that intend to overtake and smother their neighbors are tossed out. A few larger, bolder, or vertical plants scattered throughout the paving provide accents to stop the eye, acting much like punctuation on a written page.

One of these, *Salvia argentea*, is really stunning in the flagstone with its huge, heavily felted leaves. This is the first site in our garden where the stately candelabra-like flower stalks can be appreciated as much as the foliage. This plant shows itself best when viewed in silhouette, standing alone. A few feet away, the upright leaves of dwarf bearded iris help eliminate the boredom that might occur if every plant in the terrace was a softly mounding or spreading shape. *Kniphofia uvaria* 'Little Maid' and *Sisyrinchium* sp. add more foliage spikes to other areas.

Low mounds, mats, and ground covers that aren't too vigorous are the best forms for the majority of plants in the flagstone. We ended up planting thymes after all, since they are the ideal paving plant, creeping about and following the contours of the rocks. But instead of woolly thyme exclusively, there are now a dozen different varieties tucked here and there. Scented types fill the air with a hint of nutmeg, caraway, lemon, and lime on warm days. Most unusual is *Thymus neceferii* with its soft, juniper-like texture that is literally smothered with tiny magenta flowers in May. All of the thymes are profuse bloomers and so easy to grow that they tend to be taken for granted by rock gardeners. Some are too robust for the timid, but even those aren't difficult to shear back when they get out of bounds. All the thymes are evergreen for us, but variegated thyme takes center stage in winter, its silver-edged leaves blushed with rose tints beautifully complementing the stone.

In hotter spots of the terrace, diverse *Helianthemum* cultivars form tight mats that bloom for many weeks (photo, p. 99). *Genista pilosa* stays very close to the ground, slowly spreading across the stone to become a sunny burst of yellow

in the spring. *Dorycnium hirsutum* is a pretty little silver-leafed shrublet whose early flush of pink and white flowers is followed by the even more attractive seedpods that persist throughout the summer and fall. *Bolax glebaria* hugs the stone tightly, its starbursts of bright evergreen foliage never fading. The silvers of *Sphaeromeria capitata* and *Haplopappus spinulosus* (photo, p. 98) literally shimmer in the heat of summer. *Veronica tauricola*, a soft gray, lacy spreader not more than an inch tall, has tiny, starry, blue flowers and blooms on and off for most of the summer.

Of course, *Sempervivum* spp. couldn't be left out—the red or blue varieties are wonderful against the red stone. Each rosette has rapidly grown into a large colony. In one corner, a mat of *Raoulia australis* weaves attractively through a group of large red sempervivums.

A dozen species of *Dianthus* dot the paving, some quite tight and prickly to the touch, creating perfect little mounds, others lax and floppy in stature. Foliage ranges from silvery blues through soft greens. All sport cheerful, star-shaped flowers in shades of pinks and whites, most smelling sweetly of cloves.

The flagstone is the perfect site to enjoy plants whose flowers are so small that they are best viewed on hands and knees but whose growth is too vigorous for the confines of a trough. (This eliminates the need to balance precariously on a rock while trying to get really, really close up on a berm.) *Stachys chrysantha* and *Nepeta phylloclamys* are just two examples. Both possess outstanding silver, textural foliage, and they might reasonably be grown for that alone. But their tiny and subtle flowers are among the prettiest in my garden and shouldn't be overlooked. When they're in bloom I can sit on the flagstone and fully

appreciate them in complete safety and relative comfort.

I've allowed several annuals to self-sow throughout the flagstone. *Phacelia campanularia*, with its bright blue, bell-shaped blossoms is perhaps the best behaved, only popping up here and there in empty spaces. *Papaver rhoes* 'Mother of Pearl' is the exact opposite and is especially unwelcome when it comes up in the middle of an established cushion. Even so, I wouldn't choose to forgo these beautiful poppies with their soft, muted tones suggesting the exotic richness of a silk sari. I just resolve to pull out hundreds of misplaced seedlings. Most rock gardeners will now collectively cringe but I also permit dozens of Johnny jump-ups to lend their sweet charm to the general spring chaos. As with all of the other annuals, when they get too big I simply weed them out.

There are now far too many plants to use this area for entertaining. Walking through this part of the garden is like playing a game of hopscotch—a bit tricky with a drink in hand! Still it's a pleasant place to relax, and I find myself sitting out there most afternoons drinking coffee and pulling up poppies. Looking back, I still think our original plan of replacing the lawn with flagstone and woolly thyme was a good one. In our semi-arid climate it would have been an attractive, water-conserving replacement for bluegrass. However, serendipity has created a garden much richer in diversity and texture than we'd ever imagined. It's a constant source of pleasure, surprise, and delight.

Marcia Tatroe gardens near Aurora, Colorado, with the aid of several enthusiastic helpers, including husband Randy and CKC spaniel Pepper. She has been rock gardening for seven years.

WESTERNERS GO EAST

GETTING STARTED

by James L. Jones

The growing of western plants is not a novel topic in the *Bulletin of the American Rock Garden Society*. Each writer has had something new to add, one more necessary—though not necessarily sufficient—condition for the management of these touchy subjects. A synthesis of all these tips would be very useful—but here I will merely contribute my own set of necessary conditions.

I'm using the term "western plants" for that subset of species from west of the great Mississippi that have a precarious relationship with moisture, tolerating only so much and no more in air and soil. This touchiness seems to be at the base of the various forms of demise we see here in the Northeast—root rot, leaf mush, or whatever. In addition, a subset of that subset, from higher up the mountains, does not handle unremitting summer heat well and demands every plant's dream: moist but well-drained soil. An approximation of moraine conditions may satisfy these, with evaporative cooling offsetting the summer mugs. Otherwise, these alpiners are even more difficult to satisfy than the desert and prairie plants that are the primary

subject of this article.

The challenge in growing those is clear-cut: get rid of ground water as quickly as possible and reduce humidity, particularly at times of maximum heat. My approach has been to use raised beds and impoverished soil. (I haven't had enough courage of my convictions yet to grow in sand beds.) I've raised enough species to flowering size to satisfactorily demonstrate that this principle works, e.g.:

Argemone pleiacantha is a perennial version of the striking white poppy so common in the Denver area. Its perennial quality is its saving grace; otherwise it can only be described as sparse and sprawling, out to 40 cm, though the occasional flower, large and compelling, borne in August, amply redeems it in my eyes. It is easily grown in a raised bed, blooming the first year from seed.

Calylophus (Oenothera) hartwegii is very similar to *Calylophus serrulata*, an excellent, long-blooming, ground-hugging plant with square yellow flowers. *Calylophus serrulata*, in all its locations in my garden, did not reappear after the very cold winter of '93-'94, while *C. hartwegii* sailed through (as

seedlings), then went on to bloom, in a raised bed, July through September. In time, this forms a 40-cm-square mat.

Coryphantha vivipara is an absolutely indestructible ball cactus, though definitely it illustrates the cultural concept: the higher, the drier, the better. It puts out its eye-catching pink flowers for a rather short time in early June and otherwise sits there looking exotic and increasing steadily, my 15-year-old specimen now having a dozen balls forming a clump 20 cm across. Another amenable ball is *Pediocactus simpsonii*, bearing pink flowers three weeks earlier; it grows at a much slower rate.

Erigeron scopulinus I consider a must, a mat-forming, evergreen, solidly perennial daisy. It's true that the white flowers, borne in May, are rather sparse (at least in this neck of the woods; in Colorado, they are foliage-obscuring), but any truly flat, well-behaved ground cover for a raised bed has to be welcome.

Eriogonum umbellatum was my first western *Eriogonum* to bloom, requiring five years from seed. Its cream-yellow flowers were held nicely aloft in June over the mat of attractive foliage. I grow it in a raised bed, but it's vigorous enough that it might do well in the open garden. It is readily divided.

Hymenoxys subintegra presents a quandary. How to deal with a biennial that requires raised bed conditions but looks awful as it finishes flowering and goes to seed? Who has raised beds tucked into obscure parts of their garden, where such disasters can take place, out of sight, out of mind? However, seed is widely available, so one doesn't have to rely on producing one's own. The first-year mop of silver-gray foliage is well worth the effort of dealing with the muss that follows.

Lewisia pygmaea has tiny tufts of narrow foliage to 2 cm high, with dispro-

portionately large (but still small) pink flowers in May. To be seen at all this requires the prominence of a raised bed, even though it seems adaptable to all kinds of situations, even rather moist soil.

No, I won't go into a long diatribe on the backbone genus *Penstemon*, but I will point out three that I've found particularly rewarding. *Penstemon alpinus* must be highly variable in nature, because mine hardly fits the various descriptions I've seen. But I'm quite satisfied with a plant that is low-growing (10 cm) and puts out the most gorgeous sky-blue flowers just in time to harmonize with those of *Coryphantha* in June. Flowers were borne on plants one year old from seed. *Penstemon eatonii* has been the most pleasant of surprises, a superior plant that is NOT difficult to grow. In fact, I have it in the open garden, a more appropriate place than the rock garden given its substantial size, 30-40 cm. Brilliant red flowers appear in June. *Penstemon pini-folius* should be considered THE basic penstemon, easy-going and long-blooming. It will succeed in the open garden but seems to bloom longer and better in a raised bed. Red flowers are produced June through August on a 20-cm, bushy plant. It flowers in one year from seed.

Townsendia includes more monocarpic daisies, though generally they spare me the pain of the seed development process, going directly from fairly inglorious flowering to the grave. However, there are two that I can recommend: *T. formosa*, which at least gives a good display of violet flowers and then, without too much fuss, provides a crop of seeds; and *T. florifera* (I think; it came as *Haplopappus*), which is at least more than monocarpic and blooms nicely in July, with light purple flowers as per illustration in *Alpines of the Americas* (plate prior to p. 151).

These are successes among many failures. The bottleneck in my western plant pipeline, and the specific issue I want to discuss, has been raising plants from seed to the size that will see them self-sustaining.

Sowing and Germination.

Much, *much*, has been written about sowing techniques: about medium to some extent, but primarily about treatment of the seeds, including scarification, stratification, temperature regimes, etc. My own experience has been that simple stratification (seed pots placed outside under shelter for one, two, or three winter months, depending on when seed arrives) suffices for at least 82% of the species. That is to say, the grand average of germination of 76 western species ordered from three of our western suppliers in winter 1993-94 was that at least some seed germinated in 82% of seed lots sown. However, it is entirely possible that greater attention to individual detail could have resulted in additional and more profuse germination.

My medium for sowing and growing on is a mixture of equal parts by volume of coarse sand and shredded peat. That used for the seeds is sterilized by 45 minutes in a 325°F oven, done when I have the house to myself, as it doesn't smell like cinnamon and sugar while it's cooking.

Seeds are sown one packet to a pot 7 cm. in diameter. One seed per pot would probably lead to a good deal better subsequent survival, but the sheer quantity of varieties sown this year made that impractical.

Another option is to sow seed directly where the plants are to grow. This in fact seemed quite the best way in the normally moist summer of '92, but it failed utterly in the droughts of '93 and '94. Nature holds sway in the garden as well as in the wild.

Pricking Out

When, oh when, to prick out? "When the first true leaves show" is the received wisdom, but for western plants and dryland species in general that might be quite counter-productive. Many of these plants spend their first few weeks producing roots in a free-for-all to claim the greatest possible amount of the sparse medium. The longer the gardener waits, the more the roots will be intertwined. I usually separate the seedlings as soon as the cotyledon leaves have opened up and settled down. By and large this works, but there are losses, particularly among *Astragalus* spp., one of the major genera contending for the one-per-pot concept.

It is at this stage that I attempt to impose some self-discipline, transplanting the seedlings two per pot (I use the same pots for seedlings as for seed) into a limited number of pots (typically six) and *throwing the rest away!* It hurts, but space is limited (see below), and the ultimate goal is diversity, after all. The two-per-pot approach works quite well when the time comes for potting on or planting out, a division into halves causing minimal disruption.

Summer Care

We have now come to the crux of my message, the true stumbling-block in my experience in getting western plants into the garden. The problem again is in the balance between too much and too little water. The nursery bed that I use for seedlings of more standard garden plants is too fat and smothering for the westerners, while individual seedling pots are too prone to drying out in the heat of summer (unless the gardener is prepared to be on hand and alert throughout the season). The solution, in my case, has been the plunge bed.

Now, the plunge bed is something of a mystical experience. Without question it works, but how does it work? I use styrofoam cups for seedling pots, ruling out any possibility of transference of moisture through the walls, but nonetheless drying is greatly retarded. Well, granted there are *some* obvious factors at work—what isn't obvious is that they should make such a difference. First, the plunge medium, once again sand and peat moss, is going to remain moister and cooler than the air, on both accounts retarding transpiration and evaporation. Second, there will be some capillary movement of water through the drainage hole. Third, as the plants become larger and more moisture-demanding the roots may make their way through the drainage hole into the medium below (which can have its own hazards when the time comes to lift the pot). Fourth, there is substantial protection from drying winds. Fifth, the stability of the plunged pots makes it easier to water them.

Even with the buffering benefits of a plunge, watering remains the key to success. My major point here is that over-watering is not likely to be a matter of concern during this period of active growth of young dryland plants. However, I tested this thesis in 1994, which featured a summer of exceptional heat and dryness. There was no rain to confound my thesis that abundant water does no harm. A summer that strayed in equal degree from the norm towards wetness might put the lie to my claim, but I believe that the freely-draining medium of my pots and plunge frame would be able to handle whatever natural moisture came along.

Over the course of the summer I watered pots individually and, from time to time, *en masse* with a sprinkler,

in particular during those periods when I was away, the task then being entrusted to a mechanical timer. This was not generally disruptive to the seedlings, though I have no doubt some were lost that wouldn't have been if all watering had been done by hand.

Note that I haven't said anything about feeding. I don't feed my seedlings, and the plants don't seem to care. Mild feeding *might* speed growth, but the little experimentation I've done suggests it could equally be detrimental.

Planting Out

Even with the best care these western species grow slowly, often producing only tiny tufts by the end of summer. The plunge bed, elevated as it is, would probably be too cold a winter home for these, and the nursery is no more hospitable in winter than it would have been in summer. Something must be done before cold weather arrives.

The most obvious and desirable course is to put the seedlings in their permanent homes—raised bed, rock garden or whatever. This of course has its own hazards: plant too early and the new little plants may succumb to the lingering dryness of summer; too late and the roots will not be well-established before hard freezes. I myself have lost many more plants to dryness than to freezes and so have learned to restrain myself until the rains come in October. It appears that there still remains ample time for establishment, which may have something to do with the already-mentioned vigor of the root systems of these plants.

An alternative is to over-winter the plants in an alpine house. I do this for a sampling of my seedlings, giving first priority to the later-germinating

ones. For most species this works well, even in a greenhouse like mine that goes well below freezing. Here again I plunge the pots: in my standard medium in a lower bed, in perlite in suspended beds. The plants weather the cold without harm, break into growth early, and are ready to plant out in early May while spring moisture is still abundant. These plants will be substantially larger than those planted in the fall.

I've lauded the plunge bed highly, but are there solid facts to back up this adulation? Plunging was initiated in 1994. See Table one for the results. I referred above to the 82% return on 76 species in 1994; in 1993 I sowed 32 species from 2 suppliers, with 84% germination. The summer of '93 was just as fierce as that of '94.

This is clearly a step in the right direction. With this respectable basic success rate, it now begins to make sense to fuss more over details—specific germination requirements, more painstaking attention to each species, etc. Reducing the number of species sown would clearly help focus atten-

Year	1994	1993
Number germinated	62	27
Number surviving at end of summer	38	15
Percentage surviving	61%	47%

tion (a draconian measure indeed).

I'd like to conclude with a sampling of the beneficiaries of the plunge bed: *Amsonia jonesii* (how could I resist that name?), *Asclepias cryptoceras*, *Epilobium obcordatum*, *Erigeron tweedyi*, *Lewisia rediviva*, *Penstemon rostriflorus*, *Physaria didymocarpa*, *Sphaeralcea coccinea*, *Scutellaria nana*, *Spraguea umbellata*...

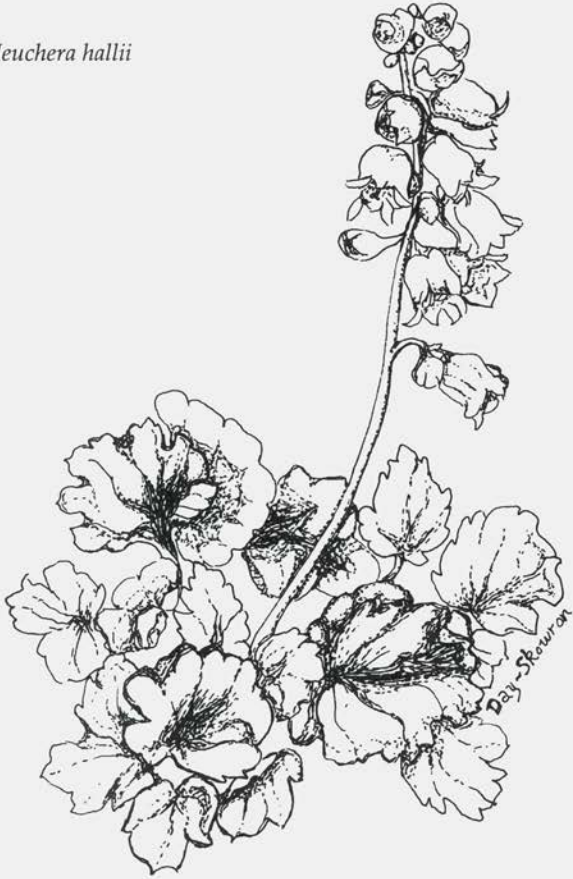
I can't go on. Spring is too far away. But I have every hope and expectation that these westerners will be there to greet me when the snow finally melts.

Jim Jones has been gardening for some 30 years. His first love was the bird-of-paradise ilk, but gradually his sights have been lowered to cold alpine houses, alliums, and such wee mounds as *Vitaliana*. He lives in Lexington, Massachusetts.



Haplopappus acaulis

Heuchera hallii



HEUCHERAS

A FEW GOOD CHOICES

by Grahame Ware

Gardeners have seen a wave of *Heuchera* cultivars come crashing onto the horticultural shore in the past few years. *Heuchera* 'Palace Purple' was the outrider of all the commercial action, as it was chosen Plant of the Year in 1991 by the Perennial Plant Association. With that selection began a significant trend towards promotion of foliage plants, or, more properly, this trend regained momentum.

Unfortunately, 'Palace Purple' is far from the best heuchera, and it was quickly eclipsed by much better hybrids such as *Heuchera* 'Pewter Veil', 'Pewter Moon', and Persian Carpet' (all infuriatingly similar, with silver overlays on the leaves.)

These woodland-type heucheras along with 'Ruffles', 'Chocolate Ruffles', and 'Ruby Ruffles' remind me of some pop music group that puts out three almost indistinguishable albums in a single year to cash in immediately on their popularity. One little ditty sounds like another—could it be the Terra Nova Bossa Nova we're hearing? In the garden many of the hybrids are like pop music, whereas the species remain the classics. You always come back to these when you

want something really compelling and enduring. However, the wave of modern new hybrids did strike an upbeat note with its bright venation and jangly silvered leaves.

Species for the Rock Garden

Whereas the cottage gardener or hardy plant devotee would be more likely to have many woodland-type heucheras at the feet of their rhododendrons, the rock gardener would more probably seek out the wild species. Here follows an incantation for crevice heucheras, a few of the better ones that I have known and loved.

Heuchera cylindrica is quite widespread throughout western North America. It is commonly referred to as alumroot. It likes north- or west-facing cracks in rock, especially granitic rocks. Its substrate has usually been furnished by moss and lichen "compost." This species also flourishes in talus at higher elevations. Vernal moisture coupled with a huge taproot provide the simple formula for survival. Remember, heucheras are saxifrage relatives.

In spring, *Heuchera cylindrica* sends out quite significant stems up to a foot

or more tall. Variety *glabella* is the most common form in Montana and most of Idaho and Washington yet is almost never found in British Columbia or Alberta. Variety *alpina* can be found in the Wenatchee Mountains south to northeastern California. The road to Lion's Head and Table Mountain in the Wenatchees is loaded with this variety growing in the talus and scree beside Forest Service roads. Then there is the variety *cylindrica*, intermediate to the other varieties and growing from the Rocky Mountains to the Cascades. Botanical differences between these varieties include the degree of hairiness of the stems and petioles, so it's a real taxonomic festival with the 10x hand lens!

Viewed from the perspective of the rock gardener, *H. cylindrica* var. *cylindrica* is simply the biggest and the hairiest. *Heuchera cylindrica* var. *alpina* is smaller in all its parts and has rounder leaves, while *H. cylindrica* var. *glabella* is the most glabrous. I have an adorable form of *alpina* that is very dense and tight with leaves not more than 3/8" across.

In all these varieties the flowers are creamy-white and are an extremely popular cocktail with wild bees and bumblebees. Bees are always foraging on these plants, working for the nectar. As in many species of *Cotoneaster*, the bee must push back the slightly enclaspings rim of the petals to push her proboscis in and get at the nectar. Perhaps the challenge is part of the fun!

Any form of *Heuchera cylindrica* makes a good addition to the wild garden, although forms other than *alpina* may be considered a tad déclassé for the more sophisticated rock gardener.

Heuchera hallii is a tough little gem from Colorado (photo, p. 117).

Scalloped leaves about half an inch in diameter form a clump 3-4" across in a few years. It bears a profusion of very pretty white bell flowers about 1/4" long on stout stems to 8" tall. This makes an excellent pot plant and is bound to win prizes on the bench if you can get it to a show at the proper moment.

Very similar is *Heuchera pulchella* from mountainous New Mexico. This species has the added allure of pinkish-red flowers and more precious dimensions. Everything is smaller except the flowers, and the leaves take on red edges and tints in summer, providing a nice contrast to the rest of the plant. Rocky Mountain Rare Plants offered a fine type from Bernalillo County, New Mexico, 10,600' elevation, numbered 92-255, in their seed catalog in the autumn of 1992. I have several plants from that seed, and I've used them in a variety of sites and exposures. Rick Lupp's mail order nursery, Mt. Tahoma, also offers this species. This plant is as sweet and choice as it gets in a genus that does seem to have been bypassed when charisma was bestowed.

Both *H. hallii* and *H. pulchella* will take more sun than *H. cylindrica* or *H. merriamii*. This last-named species is the best crevice workhorse in my unusual Fortune Creek boulder-and-crevice rock structure. Now if that seems like a winner in an odd category, let me explain further. *Heuchera merriamii* occupies several crevices in what were yawning gaps between boulders. It's not only the premier utility worker in this section of the garden, it is also very pretty. The repetition of many individual plants of this species provides a unifying force in my design. *Heuchera merriamii* never overwhelms or calls too much atten-

tion to itself. It is just there, naturalizing, providing a delicate backdrop for other plants.

Heuchera merriamii has white flowers typical of the genus, dangling from brown stalks 6-10" tall. This heuchera grows very well on a fairly exposed site in coarse, mineral rich sand. Mine is gray, granitic sand with flecks of green given by copper and potassium compounds, and reds from boron and iron. *Heuchera merriamii* has nice dimensions, neither too dainty nor too robust. After three year's growth, it should be about 6" across. The leaves are a brighter shade of green than those of most heucheras, giving the plant a hautier presence in shaded sites than many of its more dully colored cousins. Did I mention that it is thoroughly evergreen in the ostensibly harsh winter of my North Okanagan garden? *Heuchera merriamii* is native high in the northern coastal mountains of California in Siskiyou County. The Munz Manual of California Flora suggested that *H. merriamii* is "possibly of hybrid origin between *H. pilosissima* and *H. rubescens*," whereas the new

Jepson Manual suggests that *H. merriamii* is just a higher provenance form of *H. pilosissima*.

Heuchera merriamii is small enough in scale to look good in a trough. The brightly pebbled, scalloped, evergreen leaves are especially appreciated in the dark days of winter when there is not much else to look at. In short, *H. merriamii* is a real winner! and, dare I say it? a classic.

Another California alumroot, from farther east in the Sierra Nevada, is *Heuchera rubescens*. In the Mt. Shasta area it prefers dry, rocky sites between 6,000' and 10,000' elevation. The Jepson Manual lists four varieties. The most popular among rock gardeners is variety *alpicola* (photo, p. 117). It usually bears wide, foamy panicles of snowy white flowers on stalks from 6-12" tall, although, as one might infer from the varietal name, its flowers may on occasion be reddish-pink.

Heuchera glabra is the most robust species discussed to this point, although it stops well short of the pro-



Heuchera rubescens var. *alpicola* 'Troy Boy'

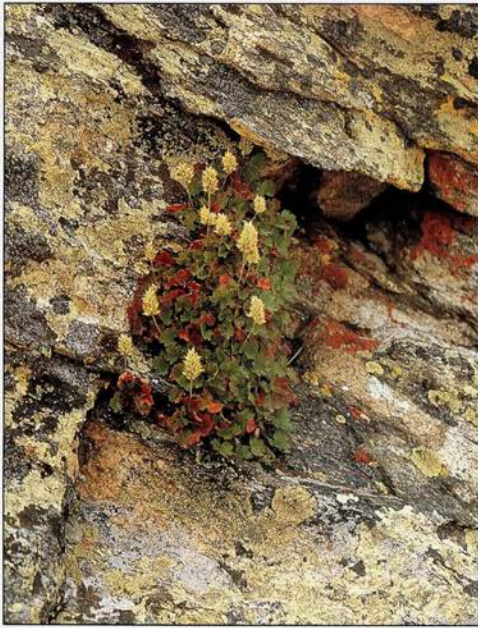
totypical coral bells (*H. sanguinea* and its hybrids). Smooth or alpine alumroot is a glossy-leaved native growing in a wide latitudinal swath from Alaska to Mt. Hood in Oregon. It ranges in altitude from sea level to above timberline. The form that interests me is from the Mt. Hood area. It takes more heat and rockier soils and is a little more compact than others I have tried. The leaves are also broader and more crinkled. It works like a dream in my garden in the transition zone between wild woodland and rock garden, and also in perennial beds. The leaves take on wonderful tints of maroon and soft purple in the autumn, and the veins become so prominent they seem to jump right out at you. This species shows much polymorphism, with many leaf forms within a population. Deposits of varying amounts of anthocyanin (a red-purple plant dye that turns redder with cold weather) around the veins of the leaves gives different forms very different looks. Breeders and plant people are exploring these variations and using them to produce all manner of cultivar selections. The new growth of *H. glabra* in spring has a delightful zesty effect due to the leaf patterns. *Heuchera glabra* requires more water and moisture than the rock crevice species of the high mountains, and therefore it also accepts regular garden regimes on the West Coast with more aplomb. You have to like this one!

The Columbia River Gorge is home to so many rock garden beauties that do so well in the climates from Victoria to Vernon. *Heuchera grossularifolia* is one. The currant-leaf alumroot is a perky little thing that flourishes in the talus slopes and shady cliffs from Hood River to the Dalles in Oregon. This slender-leaved variety, variety *tenuifolia*, is larger and more handsome

than the type found in Idaho and the Steens Mountains. However, that form has its positive characteristics to be sure. This species does well without fussing in West Coast gardens and has a generous share of demure charm.

Heuchera parvifolia is an excellent crevice species for the rock garden. It has a wide range of occurrence from Montana south through the Rockies to Arizona. It is usually found in crevices or scree slopes in alpine tundra. Flowers are a soft yellow, and the leaves are quite small (1"). It works well with many structural and color schemes in the rock garden. Sow directly in crevices for the best result, or plant into the garden in early spring when the seedlings are only a few weeks old. Part shade in the afternoon is preferred for most sites and locations. Unfortunately, this one hasn't been on seed exchange lists for quite a while.

Heuchera micrantha is worth growing as well. I'm sure it's one of the most widely grown by rock gardeners, along with *H. cylindrica*. Small-flowered alumroot, as *H. micrantha* is commonly known, has nice little side branches from which the little creamy-white bells hang. This gives the inflorescence an airy look that some of the smaller crevice heucheras don't have. The popular new cultivar *Heuchera* 'Ruffles' is a selection of this species. It looks marvelous once it establishes itself in the garden. I love to use it in the corners of boulder beds where its profuse foliage comes bursting out and over the rocks. This gives a softer edge to the ending of the garden. 'Ruffles' stays in flower over a long period. Some believe 'Palace Purple' is a selection of *H. micrantha* as well. Others, however, attribute its parentage to the eastern woodland species,



Heuchera bracteata (p. 125)



Heuchera hallii (p. 114)

Heuchera rubescens var. *alpicola* (p. 115)

photos, Panayoti Kelaidis





Talinum brevicaule (pp. 92, 93)

Talinum eyerdamii (p. 87)

photos, David Ferguson

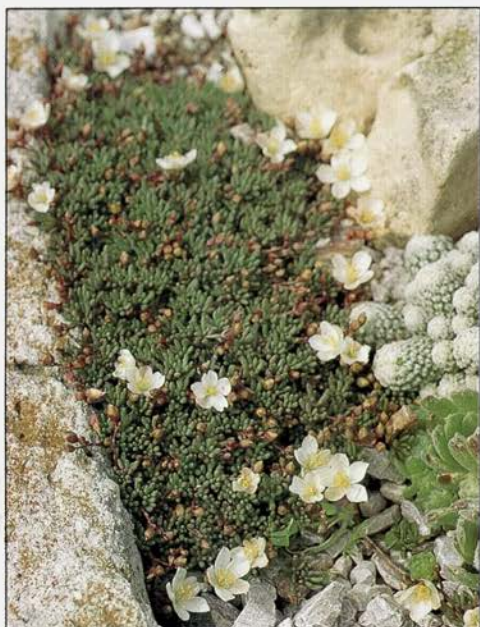




Talinum brevifolium (p. 93)

Talinum sp., close to *T. brevifolium*, *T. brachypodium* (p. 93)





Talinum sediforme (=okanaganense)
Panayoti Kelaidis

Talinum sediforme (=okanaganense)
(p. 93) David Ferguson



Talinum brevifolium (p. 93)
Panayoti Kelaidis

Talinum "calycinum" of hort., a new species
from the Ozarks (p. 91) Panayoti Kelaidis



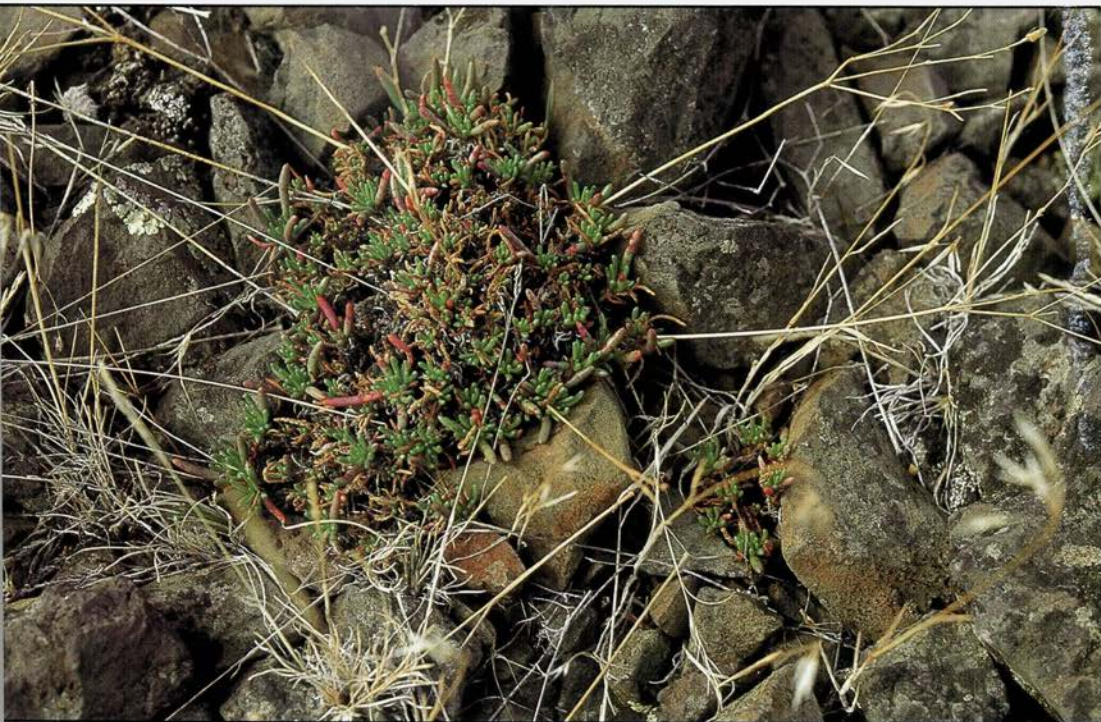


Talinum spinescens (pp. 93, 94)

Panayoti Kelaidis

Talinum spinescens, growing wild in Oregon

David Ferguson





Talinum brachypodium (p. 93)

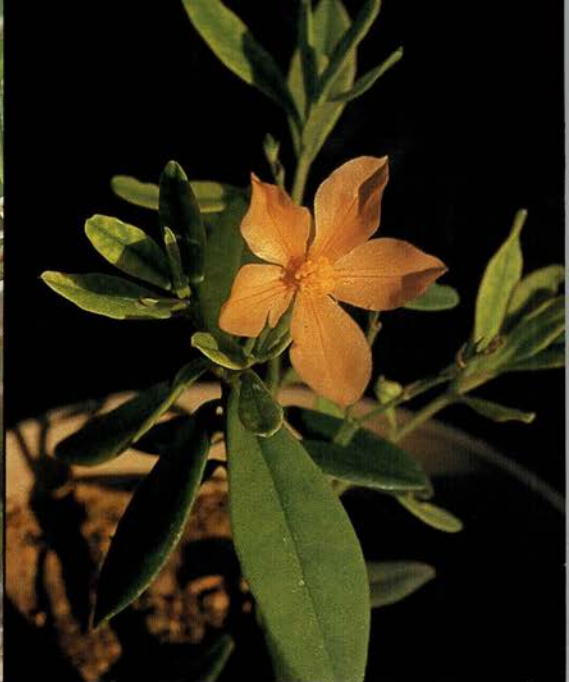
Talinum brachyypodium on flats of lake

photos, David Ferguson





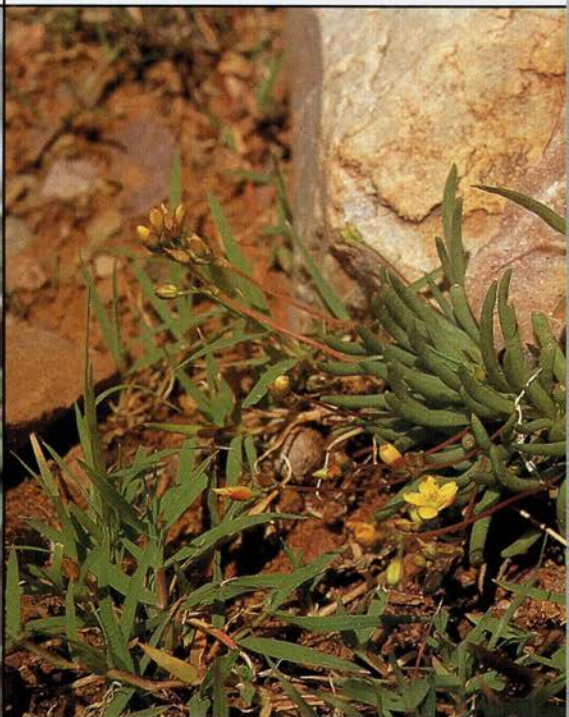
Talinum sp., from South America (p. 86)



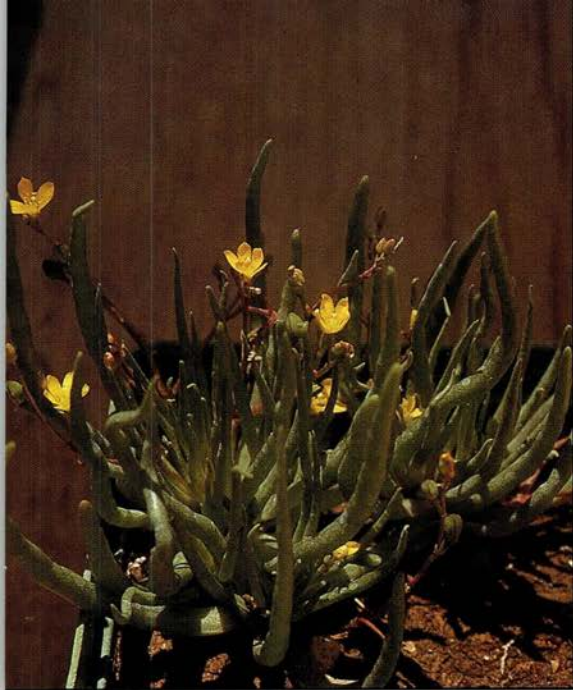
Talinum paraguayense (p. 87)



Talinum lineare (p. 85)



Talinum punae (p. 89)



Talinum humile (pp. 89, 90)



Talinum napiforme (p. 90)

Talinum parvulus (p. 89)

photos, David Ferguson



Heuchera americana. I'm in the *americana* camp.

Charles Oliver of Primrose Path nursery in Pennsylvania has done some lovely work with heucheras. His miniature hybrids (*H. hallii* x *H. pulchella*) are vigorous little dears that spew forth myriads of creamy, pink-tinted flowers on 10" stems. Oliver has also crossed the diminutive *H. hallii* with a bright red clone of what must be the most common garden hybrids, *H. x bryoides*, itself an uncertain melange of *H. sanguinea*, *H. micrantha*, and even *H. americana*. The resulting "Pikes Peak Hybrids" should be of interest and worthy of exploring for further trial and selection.

Oliver has also crossed *H. x bryoides* with *H. pubescens*, a native of the Appalachian shale barrens, to come up with another group called the Larenim Hybrids.

Heucheras are quite cosmopolitan in their tastes and attractions and not afraid even to step outside their genus if it suits them. Thus, the bi-generic phenomenon—x *Heucherella*, a cross made with *Tiarella*. Again, several selections as to color and aspect have been made that will add even more interest to woodland and rock gardens, especially in the Eastern United States.

As you can deduce, heucheras hybridize readily and easily. Even the Jepson Manual suggests that this genus needs monographic study. How many really bedrock species are there in this multifaceted genus? Does the variation between species simply reflect the impact of environmental factors in shaping the morphology of plants? As gardeners, do we really care? Not deeply, methinks. And why should we? I believe, as rock gardeners, we should concern ourselves with

practical and aesthetic priorities and leave taxonomy to others. We will, no doubt, be seeing more and more interesting hybrids from gardens and nurseries with, hopefully, an emphasis on cultivars for the rock garden.

The species, however, will always sing the sweetest songs. Yes, I include with these even the natural hybrids. What would music be without the harmony of individual notes blending into a rich chord filling the air with sweet sounds and lifting the soul of the listener.

While I'm in a confessional posture, I must admit that I grow many perennial and woodland types of coralbells as well. I just can't help myself. 'Firefly' and 'Pewter Veil' are here, along with young plants of 'Apple Blossom', 'Chocolate Ruffles', 'Ring of Fire', 'Carousel', 'Jack Frost', 'Frosty', 'White Marble', and more. I just whistle a happy tune, and put aside my fears that my status as a rock gardener might somehow be lost. I'd always rather try "both" than choose "one or the other."

I'm still looking out for *H. bracteata* (photo, p. 117), *H. versicolor*, *H. duranii*, and *H. parishii* for possible inclusion in the rock garden. Search for them in the seed exchanges and the catalogs of Northwest Native Seed, Southwest Native Seed, Gardens North, Alplains, Rocky Mountain Rare Plants, etc.

Growing heucheras from seed

These plants are easily raised from seed. They require little, if any, conditioning. The most straightforward method of production is to sow the seed directly into pots of the proverbial gritty soil mix and place outside in early spring. Place number two chicken grit over the freshly planted seed. You might want to do what Jack Elliott does to get a well-drained mix and use the chicken grit in the soil mix itself, as

he recommended at last year's Western Winter Study Weekend. I have had even the high alpine types such as *H. hallii* and *H. pulchella* germinate well with this outside method. There is little problem with damping off when grown outside.

I like to leave the seedlings in a pot until their roots have reached the bottom of a 3 1/2"-4" pot. They seem to transplant better. Grow them on in deep pots. Styroblocks of the type used by forest nurseries, generally 6" deep, are excellent for this purpose. Look for the wide-celled types 2-3" across. These pots are great for overwintering as well as oversummering, because they reflect the sun and work to keep the roots cool.

Micropropagation is also effortless.

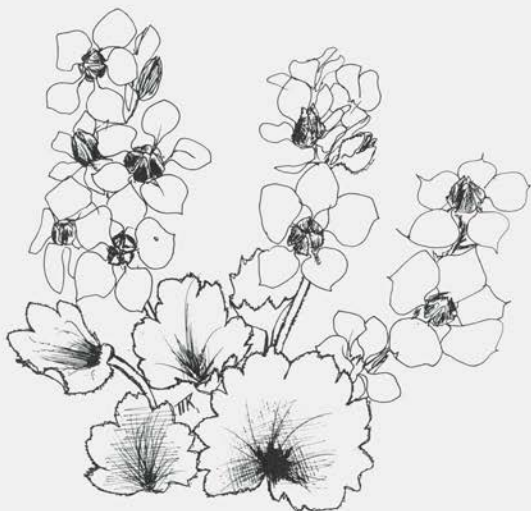
Plant out new seedlings in early autumn, being careful to label, and, if you are planting in the open garden, use a solid stick on the north side of the plant leaning forward to protect the plant. This will prevent disturbance by cats or other small animals during the winter.

If you plant into a crevice, follow the usual steps. Don't forget to place a small rock underneath the heuchera so that any snow load and rain will not cause it to slip out of the crevice. Rocks placed this way usually look nice as well.

Heuchera species may not be at the top of everyone's list of sought-after acquisitions. There is no dramatic unfolding of huge, showy flowers, no forget-me-not blue, no irresistible tight buns. Yet these plants are a solid element well worth having, plants that lend structure to the garden on a daily basis. Try some in a trough or crevice, and notice how they add cohesion to your rock garden.

Drawings above by Rebecca Day-Skowron; below by Panayoti Kelaidis.

Grahame Ware gardens in Armstrong, British Columbia.



Telesonix jamesii

YEAR OF THE HOOP HOUSE

1994 at Fort Courage

by *Ev Whittlemore*

Don't get me wrong! I love to garden in North Carolina. But sometimes the challenge thrown down by the climate can be a bit too much. One week in October brought us 4" of rain. During three weeks of summer we were gifted with 16". And when the sun shines hot and bright on my water-filled alpiners, they frequently object and die.

Some plants, such as phloxes, polygalas, most aquilegias, *Dianthus*, *Iberis*, and *Erigeron* roll with the punches and keep growing. Put *Campanula*, *Primula allionii* forms, the good species of *Draba* or *Androsace*, any *Dionysia* or *Astragalus* outside, and I can just about say good-bye to them. I decided this state of affairs was unacceptable. Bruce and I knew something had to be done to keep the gardener—and cook—happy. Since he can do plumbing, electrical work, and carpentry, while being less than successful at ornamental gardening, there was no doubt as to what he would contribute.

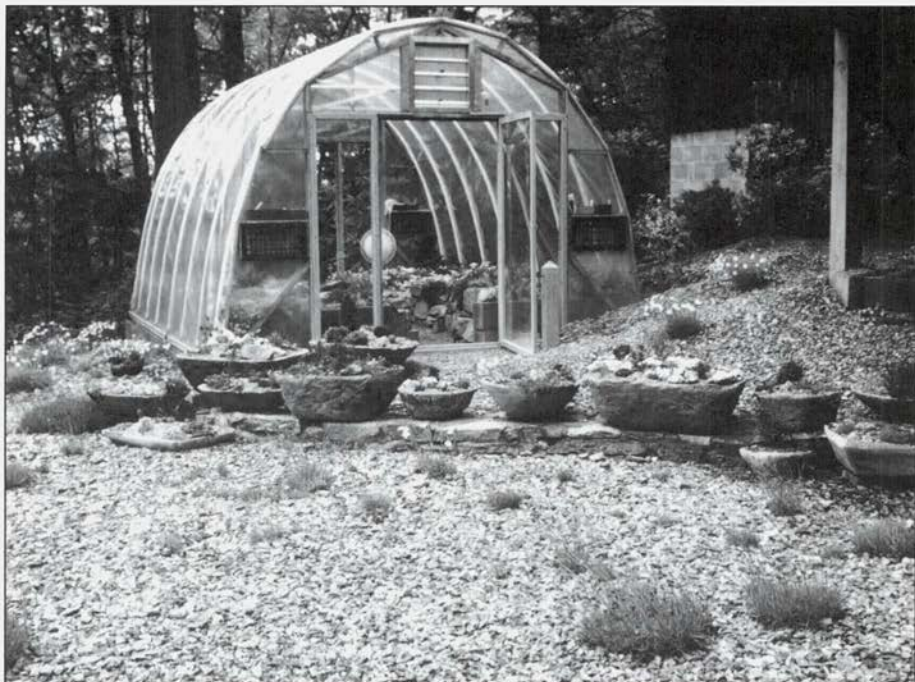
Our first attempt at climate control was several years ago when we built our first hoop house. Enclosed on all sides and fairly airtight, Hoop House #1 can be heated if necessary by elec-

tric space heaters. We do this when the temperature threatens to go below 17°F. Two automatic vents on the west side open at 70°F and close at 40°F. There are oscillating fans in front of each vent. Two more vents are opposite on the west side, so the air can move over the plant beds and flow outside. Since this house is south-facing and no shading is used in summer, a top exhaust fan kicks on at 75°F.

Here I grow my dionysias, alpine daphnes, raoulias, *Rhodohypoxis*, the choicer species of *Draba*, and some acantholims. And, if you know me, you will understand that "miscellaneous" plants are always included.

I needed a controlled and shady growing area, so construction of H.H. #2 began August 19th. Conifers and shrubs were transplanted from the construction site, and the clay subsoil was removed. Being older and wiser (and lazier?), we now rototill the clay and we wheelbarrow it away for fill, then rototill another layer, which saves some really hard digging.

We had various bits and pieces of material from other projects, like the construction of cold frames and H.H. #1, and we intended to use these as



much as possible. We didn't want to pay to dump it at the dump "some-day." Transylvania County has a policy of charging for each bag of rubbish. We don't like to pay these dump fees and are into recycling here.

By the 23rd of August, Bruce was putting up supports for the 1" tubing which would hold the greenhouse poly. Automatic vents were built into the top of the east and west sides of the house. The poly-covered sections on these sides and the door (recycled from another project) can be removed and filed away during hot weather. A length of removable 60%-shade screening is attached north to south in mid March. Two large shelves were constructed on the back wall, the side that abuts the garage foundation, with the order to "Make them strong! I don't want my pots to fall." Since H.H. #2 isn't air tight and will have no auxiliary heat, Plexiglas was used to enclose the area between the top and

bottom shelves. I will grow seedlings "hard" here. The top shelf contains seed pots reluctant to germinate which need protection from excessive rains.

An oscillating fan on the north side at ground level keeps air moving at all times. The greenhouse poly on the opposite side can be rolled up 3', so that air moves over the beds and out.

I had given thought as to what I planned to grow here, so appropriate soil was added with a path of grit through the middle of the bed. A base of creek sand for drainage was topped by a gritty, humusy soil. Campanulas are the main crop here, and within three months *Campanula argyrotricha*, *C. raineri*, and *C. piperi* forms are spreading. *Campanula alpina*, *C. zoysii*, and *C. rotundifolia* ssp. *arctica* caught hold. Several areas where *Campanula* seeds were sown directly are being watched closely for germination. *Ourisia microphylla* and *Harrimanella*

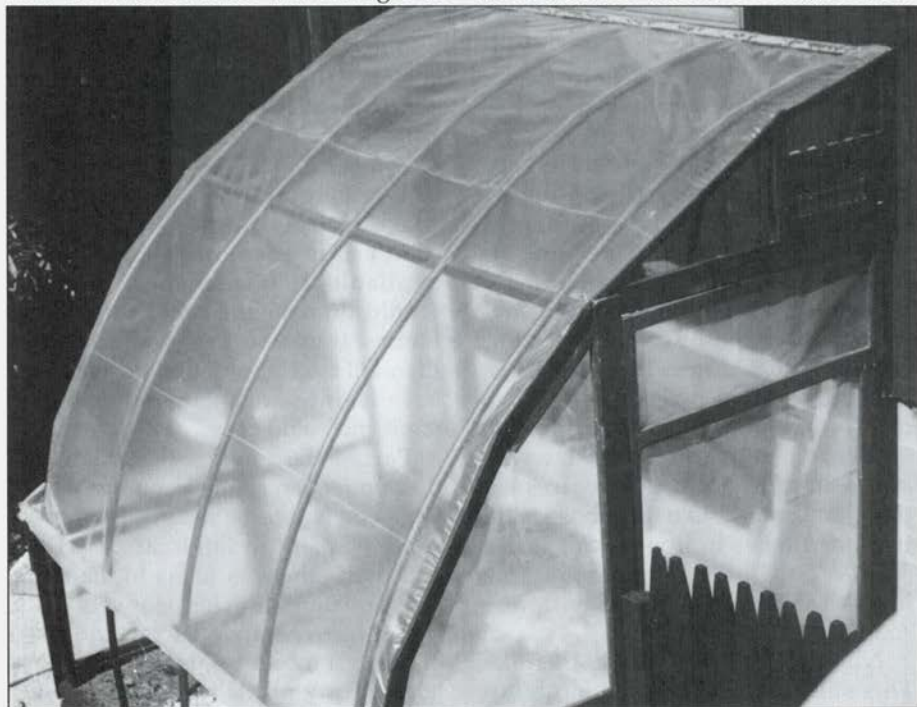
stelleriana get extra water. *Phlox adsurgens* and a dwarf form of *Cornus canadensis* are doing well mulched with chopped pine needles. All other plants have a small size rock mulch.

Since H.H. #2 was immediately too small, we started H.H. #3 September 12. This was to be on a slope naturally shaded by trees, rhododendrons, and laurel. Clearing this area for a 12' x 14' hoop house wasn't easy. Bruce chain-sawed the rhododendron and laurel, and I matted out the roots. When the roots were too deep and huge for me to remove, we both worked on them. Even though we both disliked the job, it was necessary, since the stumps are 100% guaranteed to resprout, and we didn't want this in the new house.

By September 19 all the roots were removed and the slope rototilled. Bruce put down 4" x 4" preserved timbers for a foundation and brought in

electricity for the oscillating fans. We used 2/3" 20'-long PVC pipes to make the hoops. The supporting wood and ridge pole were sturdily constructed to be effective during strong winds. This house was to be constructed differently from the others, with greenhouse poly used only on the hoops from north to south while the east and west sides were left open. I didn't want to protect the plants here from temperatures, but only from rain. I also provide guaranteed air movement.

Our two oscillating fans are on the north side and directly opposite we are able to roll the poly covering up about 3', so there is good air movement across the beds in the growing season. While checking things over one day, we noticed rain going into the end of the bed on the top of the slope. An addition of a small poly canopy section controlled this problem and even in driving rain all is dry. The woodland soil wasn't too bad, so creek





Hoop House #4

sand, grit, and fourteen 40 lb. bags of cow/compost were rototilled together.

I've always loved saxifrage and wondered if I could grow them better than on the outside saxifrage slope in the east garden. A tufa slope now holds many of them. Who could not love the many *Primula allionii* forms? A generous friend in England sent me a lovely collection of seedlings, which are now situated near the fans to keep their leaves from excessive wet. I will try some of my *Calceolaria uniflora* seedlings here...surely someday I can say I can grow them. Androsaces and douglasias might like this house better than the frames in front of the garden shed. A good part of the fun in growing lies in experimenting with new conditions and soils.

Now hold on to your hats, folks! This still wasn't enough hoop house

for me. After working on leaf control for five weeks and catching up on various jobs, we started H.H. #4 on December 2.

We were getting desperate for a place to put another house as we didn't have anymore land obviously available. I chose a spot I thought would do near the other three hoop houses. It was on a more severe slope than H.H. #3, but I figured we must have learned something while building it and could cope.

Part of the south rock garden and the conifers and azaleas on the woodland side had to be removed. I moved some of them to landscape H.H. #3 and used others as fillers in the other rock gardens on the property. The rocks were removed from the rock garden, some to be used in the new house. Forty plants were potted to re-

landscape the outside of H.H. #4 after construction, since we had to clear extra area to work. Rock mulch and grit from walks were bagged to be reused, and the slope was cleared.

While I was doing these things, Bruce was thinking "foundation." He knew we had to have something solid on the severe western slope on the low side of the hill. He ordered 162 concrete blocks. Thinking along further, he ordered sixteen 3/4", 20' PVC pipes and 4" x 4" preserved beams. He ordered wood for supports and a ridge pole. What an unkind blow to my checkbook! Since we didn't need the wood material for a while (the foundation wasn't started), of course it was delivered the same day. Using a ladder, we filed it in the garage loft to keep it dry.

The next step was constructing the foundation. The blocks on the west side (where the hill was steepest) were mortared six high, with this wall grading down to only 14" high at one point. Where the hill was higher (the concrete block foundation lower), we planned to use the 4" x 4" beams on the clay, running them onto the blocks to make the foundation level.

Construction of H.H. #4 uses eleven 25' PVC pipe sections with the slope of the hoops arranged off center, so the south exposure has a longer decline than the north, providing maximum light. To achieve this lopsided curve the main ridge pole must be off center. Two auxiliary ridge poles are supported by upright supports at the east and west ends of the house, which also provide for entry openings, and by two center poles inside the house. The PVC pipes rest in grooves cut into the ridge poles. Only the center ridge pole has a top board with corresponding grooves to fit over the bottom board to totally contain the PVC pipes. The interior height is 8.5'. Tufflite 111

Greenhouse Film covers the house. The east and west ends of the house are not covered. This is as technical as I can get without becoming confused.

We divided the 16' x 20' area into sections and started work at the north end where the soil would be deepest. The rototiller was used to loosen a layer of clay, and we moved it out for back fill. We continued to remove layers until we reached the desired ground level. The next process was to shovel in good, gritty topsoil from the adjacent rock garden we had disassembled. I moved in creek sand over this until the level reached almost to the top of the foundation. Finally the 16' x 20' area was just a hole in the ground on a slope, almost filled with sand.

The interior of H.H. #4 is divided into three growing sections of varying depth. The hill slopes to the south, and the soil mix is deeper on the north, uphill side. There is at least 28" of modified soil in all sections. The northwest corner is 48" higher than the southeast corner.

My preferred soil ingredients are Chat 78, a crushed rock up to 1/4" long; Byrum's potting soil, a mix that when combined with Chat resembles mountain soil; and Black Kow manure, a composted manure that comes in 40 lb. bags.

In the deepest planting section I put down a 4" layer of Chat and fifteen bushels of Byrum's potting soil on top of the creek sand, and Bruce rototilled it in. This provides nourishment for deep-rooting plants. The west bed has an addition of lime (both quick powder and longer-release pellet lime), 4" of Chat, 4 bags of manure, and 4 bushels of Byrum's, all rototilled into the creek sand. After gardening in North Carolina for several years I know that the climate would never permit plants to grow in straight creek

sand. A small buffer length of three bushels of Byrum's and creek sand separates this lime area from the rich scree at the east end of the house.

The rich scree contains 4" of Chat rototilled into the clay base bottom. The next layer included six bags of manure placed on top then rototilled again so some mixed with the first level. A third layer of 7 bushels of Byrum's was mixed with 4" more of Chat and the depth of the rototiller blades meant this mixed a bit with layer two. A thick layer of Chat 78 will be used as a top mulch.

We used 12 yards of creek sand and 5 1/2 tons of Chat 78 in constructing this hoop house. Bruce decided one of my contributions of work would be to move these materials to the work area by wheelbarrow. I did. By the time the project was completed I used 30 bushels of Byrum's potting soil. The Chapter gave us a gift certificate for Christmas...we bought cow manure.

Inside the hoop house a garden scree slopes from the north side down to the lime and rich scree areas. Where the adjacent rock garden on the east is higher than the foundation, there is a low retaining wall between the two areas—planted, of course. Where the adjacent rock garden on the east is higher than the foundation of the hoop house, we built a planted rock wall inside the hoop house with the top growing area abutting the rock garden.

Inside the west end there is a strip of pure creek sand 2 1/2' wide running the length of the house. Pots of germinated and ungerminated seeds and potted seedlings are protected here from the ravages of heavy rain. Two 16" oscillating fans on the north end blow air across the growing bed. In summer when the Tufflite is raised up to 3' above the ground level, the air will be pushed outside. If this is not

enough air movement we can install another oscillating fan in the center for greater movement. Summer growing conditions will help us decide this.

With the thought of this specialized growing area, I ordered seeds like erigonums, lepidiums, *Astragalus*, and *Cryptantha*. Perhaps my *Lupinus lepidus* var. *lobbii* and *Talinum thompsoniae* will decide to live here. *Lesquerella alpina*, *Gilia aggregata* var. *aggregata* and *Silene petersonii* are being tried. Will townsendias and penstemons re-seed here eventually? Will I ever consider *Aquilegia scopulorum* and *Hedyotis nigricans* weedy, because they self-sow so abundantly? Planting my specimens of *Draba mollissima* here was a must. I am confident my western plants will survive better here than in an open garden.

A few dwarf conifers were added for scale, and rocks were used in moderation. The outside of the hoop house was re-landscaped. Water was brought to a more central point, so it would be convenient for watering. I hate attaching and dragging hose lengths.

I mentioned to some Chapter members that this was the absolutely last hoop house we were going to build at Fort Courage. And they laughed! Could they possibly be right?

Ev Whittemore and her husband Bruce garden near Penrose, North Carolina. They are fearless in the pursuit of new plants and seem tireless in undertaking construction projects.

PLANT SHOW

Staging the Philadelphia Flower Show, 1994

For the 1993 Philadelphia Flower Show we had the well-known Scottish nurseryman Jim Jermyn design our prize-winning exhibit; it was a hard act to follow. Nevertheless, by April, while still basking in the glory of our recent success, we held the first meeting for the 1994 exhibit. The theme for the show, a theme to be applied by all displays in all categories, was "Islands in the Sun," a tough subject for the Delaware Valley Chapter members who pride themselves in their cultivation of alpine specialties. However, a commitment to exhibit was made.

We considered creating a natural rock garden setting again, but our chairperson, Jane Grushow, favored a more formal setting. So we decided to place our garden in a sun-soaked terrace, planted with exquisite alpiners and other small plants from all over the world. It was titled "Escape to the Sunshine: A Terrace Garden for Small Plants." The plants were to be placed in troughs about waist high for the benefit of the viewer. Committee members Joyce Fingerut, Mike and Jan Slater, and John Gyer produced a long list of flowering and foliage plants suitable for our sunny scene. To avoid a last minute scurry to locate these plants, Mike canvassed Chapter members for plants to propagate and grow over the summer. Dr. Gerry Barad, a succulent specialist, was especially generous: 15 flats of succulent offsets were prepared during the growing season. Autumn weather spurred their development, and by late fall they looked splendid and showed the hand of an expert grower.

Since the Chapter does not have warehouse space available, the patio background set had to be built out-of-doors during the good weather. It was made in sections using Homasote insulation material held together with 1/4" wooden dowels, and the whole was then given a stucco finish. The sections were stored in our garage until the final assembly at the show.

During the summer, the committee got together at the Slaters to re-pot plants, at Barad's to line out succulents, and at Fingerut's to pot bulbs for forcing. We also did a rough construction of the set before it went into storage. As the year ended, the Slaters constructed a series of cold frames using Homasote and recycled storm windows, and the plants were tucked in for a short winter.

The winter weather was horrible. Two Chapter meetings had to be canceled. The cold frames holding the plants were buried under 3' of snow. It was not until the end of January that the Slaters were able to liberate the plants to go into members' greenhouses and under basement lights for forcing. The weather was one aspect that got me down. Having been in a retail florist business which involved deliveries, I foresaw the prospect of moving plants and the set to the Civic Center in Philadelphia in deep snow as a nightmare. Fortunately, the snow held off while we built the patio walls and arbor. There was one snowy day that kept most of us at home, however Pat Valentine was able to get in and did wonders leveling the mulch and setting the flagstone in place. The set was in great

shape when 20 members arrived on Friday morning, the last day of set-up, to put in all the wonderful plants that the Slaters had assembled. Groups of plants and bulbs emerged between the terrace stones. The troughs were planted to overflowing and mulched with carefully placed stone chips. Even our grapevine, on the arbor, had been forced into enough new growth to legitimize its inclusion in the garden. Though many of the plants were not fully open, due to the late start forcing, we had quite enough to provide a dazzling display. The judging was to take place the next day.

Overnight disaster struck. One of the troughs had an unreinforced false bottom, which sank 6" so that one had to peer into the trough to see the plants. It was certainly not part of our original trough to see the plants. It was certainly not part of our original design, but the judges didn't seem to mind one bit; we received "Best in Show" in our category and a special award for horticultural achievement from the Federated Garden Clubs of Pennsylvania.

Show attendance broke all records. Twenty-seven thousand attended just on the first day it was open to the public. NARGS was also well represented by chapter members in the horticultural classes, who took home many blue ribbons and special awards.

When the show ended on Sunday evening a week later, members gathered one last time and after fortifying themselves with a supper provided by Grushow, they potted up the plants for a sale to be held the following week at Bob Way's greenhouse. Paving stones were removed and neatly piled up, then the set was dismantled and carted to the dumpster. Some pieces were saved as mementos of our exhibit, while larger sheets of Homasote were salvaged to be used to insulate a wood drying kiln. It was indeed a happy ending to a year-long project that demonstrated the high quality of NARGS gardening to a very large audience.

—Dick Van Duzer

<i>Androsace sarmentosa</i>	<i>panica</i> var. <i>seguensis</i> , <i>D. ramo-</i>	'Joel's White',
<i>Antennaria dioica</i> var. <i>rosea</i>	<i>sissima</i>	'Schneewittchen',
<i>Aquilegia flabellata</i> 'Nana Alba'	<i>Dracocephalum botryoides</i>	'Sileneflora', 'White Delight'
<i>Arabis caucasica</i> 'Variegata'	<i>Euonymus fortunei</i> 'Emerald	<i>Potentilla alba</i>
<i>Arabis x kelleri</i>	<i>Gaiety</i> ', 'Emerald and Gold'	<i>Potentilla tridentata</i> 'Minima'
<i>Arctostaphylos uva-ursi</i>	<i>Festuca ovina</i> 'Sollinng', 'Elijah	<i>Sedum album</i> , <i>S. dasyphyllum</i> ,
<i>Arenaria montana</i>	<i>Blue</i> '	<i>S. spathulifolium</i>
<i>Armeria juniperifolia</i>	<i>Geum triflorum</i>	<i>Teucrium chamaedrys</i>
<i>Bellium minus</i>	<i>Gypsophila cerastioides</i>	<i>Teucrium montanum</i>
<i>Campanula carpatica</i> 'Blue Clips'	<i>Hedera</i> 'California Pencil Point'	<i>Thymus pseudolanuginosus</i> ,
'White Clips'	<i>Hedyotis caerulea</i>	<i>T. serpyllum</i> , <i>T. vulgaris</i>
<i>Campanula garganica</i>	<i>Helianthemum nummularium</i>	'Argentus', 'Doretta Klaber'
<i>Campanula pilosa</i>	'Flame', 'Wisley Pink'	<i>Tulipa batalini</i> 'Bronze
<i>Campanula portenschlagiana</i>	<i>Ipeion uniflorum</i>	Charm', Bright Gem'
<i>Carex conica</i>	<i>Iris danfordiae</i>	<i>Tulipa kaufmanniana</i>
<i>Cerastium tomentosum</i>	<i>Juniperus chinensis</i> 'Hetzii	'Waterlily'
<i>Chrysogonum virginianum australe</i>	<i>Columnaris</i> '	<i>Tulipa pulchella</i> 'Persian Pearl'
<i>Crocus ancyrensis</i> 'Golden Bunch'	<i>Laurentia fluviatilis</i>	<i>Tulipa turkestanica</i>
<i>Crocus chrysanthus</i> 'Cream	<i>Lesquerella kingii</i>	<i>Verbena peruviana</i>
<i>Beauty</i> ', 'Snow Bunting'	<i>Mazus reptans</i>	<i>Veronica incana</i>
<i>Crocus susianus</i> 'Cloth of Gold'	<i>Penstemon hirsutus</i> 'Pygmaeus'	<i>Veronica livanensis</i>
<i>Delosperma ashtonii</i> , <i>D. cooperi</i>	<i>Phlox subulata</i> 'Coral Eyes',	<i>Viola Johnny-jump-up</i>
<i>Draba aspera</i> , <i>D. densifolia</i> , <i>D. his-</i>	'Emerald Blue', Green Ridge',	

NEW LEAF FORMS

of *Hepatica nobilis*

by Severin Schlyter

In Sweden there is only one species of *Hepatica* that grows wild: *Hepatica nobilis*. It is found across virtually the whole country but is not a very common plant. In the northernmost sections of the country it is more sparse. In central Sweden and in the south it is far more common, especially in areas where there is lime, clay, and pyrolusite, a mineral whose presence in the soil seems favorably associated with the occurrence of hepaticas.

Hepatica nobilis grows mostly in leaf litter on clay soils in the shade of trees or other vegetation. In most areas specimens are of the form described in botanical literature as the prototype of the species, with three-lobed leaves and rather small blue flowers with a variable number of petals. There is little morphological variation within the species. However, in a few areas there are occasional white, mauve, blue-white, pink, or even red flowered individuals. Variations in the leaves are even more rare, and extreme variations are conspicuous by their absence. Even more unusual than white-flowered plants are glabrate plants. These hairless individuals always have white

light, pea-green leaves poor in chlorophyll. This albino characteristic seems to be quite recessive, as I rarely get glabrate individuals in the first generation (F1) after crossing a glabrate mother plant with a typical plant as pollen donor.

Nevertheless, I have long been interested in leaf variations in this species, and over the years I have acquired several very interesting forms. Because the leaves remain on the plants year-round, whereas the flowers are a fleeting, spring-time pleasure, I have, over a period of 20 years, hybridized three atypical forms of *H. nobilis*. The first has leaves of normal shape, but strongly marbled. I have called this form "M." The second, from Gästrikland, has crenatulobe leaves, heavily scalloped, and I call it "G." The third is a clover-leaved form and is called "K." M has blue flowers, G dark pink, and K blue. One must remember that it takes about four years to get a flowering specimen from seed, so the hybridizing and selection process is slow work. It is my hope that by selecting the most interesting variants and propagating them vegetatively, worthy cultivars can be made

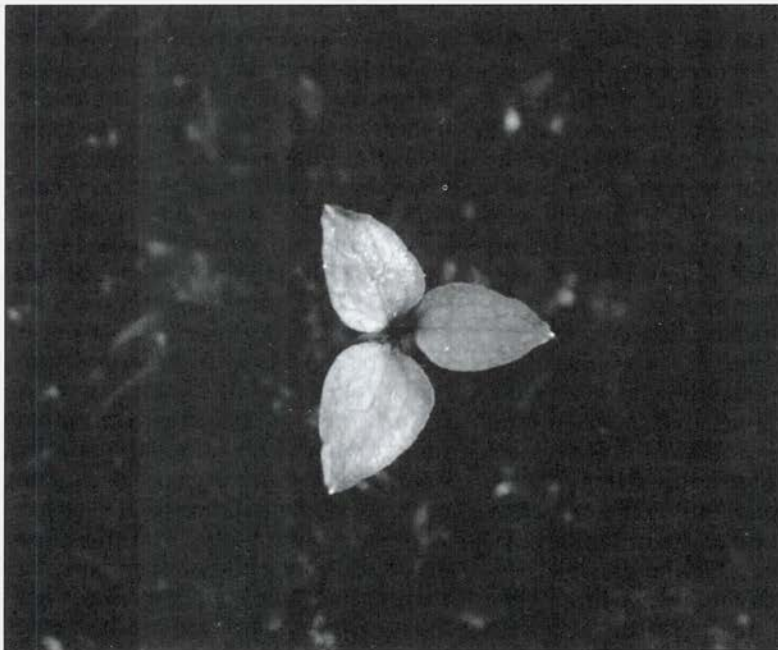
available, which ultimately would be highly desirable for gardeners.

Many years ago I began a series of experiments to determine whether the strongly marbled leaf was a dominant character in *hepatica* (photo, p. 135). In crosses using the strongly marbled individual as the mother plant, 85% of the first generation resembled the marbled individual, both in the clear gray marble pattern of the leaf, the leaf shape, and the blue color of the flower. Several years later I crossed an individual with crenatulobe leaves with another with marbled leaves and blue flowers. After four generations of crossing within this group of hybrids all individuals retained both the crenatulobe form and the marbling, although there was some variation in the contrasting light gray and green of the marbling. No descendants of this cross had the normal shape of the marbled parent's leaves. However, about a third of the

flowers of the descendants were blue or mauve-flowered. Obviously, the inherited characteristic for crenatulobe leaves is dominant over the more normal shape. The contrast between light gray and green in the marbling were largely the same in the descendants.

A second cross produced an even bigger surprise. I crossed the crenatulobe, dark pink-flowered form from Gästrikland in south Lapland with a clover-leaf form from central Sweden (photo, p. 122). The only specimen that survived had very faintly curled leaves, the incisions between the leaf lobes only vaguely marked, and blue flowers. The clover-leaf form was used as the mother plant. Individuals produced in the second and third (F2 and F3) generations had such deep incisions between the lobes of the leaves that they actually appeared as independent leaflets (see Fig. 1). Some individuals had three, flat, independent leaflets each rimmed with many

FIG. 1



small, rounded, lobe-like knots (see Fig. 2). Others had little curved, crenatulobe leaves reminiscent of the original parent from Gästrikland, but all three leaflets were fully devel-

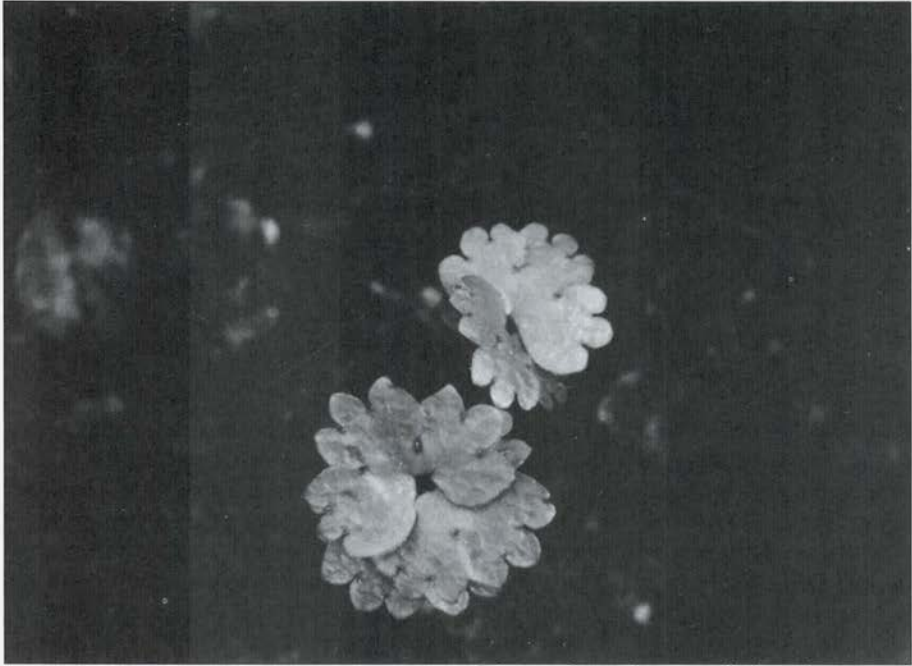


FIG. 2

oped and lacked stalks. The blades of each leaflet were held at different angles. In one single specimen the middle leaflet was stalked, on a lower level than the two outer leaflets, and the blades of all three leaflets were held horizontal (Fig. 3).

In some individual instances leaves have formed which are reminiscent of flowers. Stalked leaflets are borne almost evenly round a single point (Fig. 4).

In this sort of work one can never be careful enough, as an uncontrolled hybrid creates a year's unnecessary delay, and the work of raising seed of unknown origin is wasted. Uncertainty about which cross has been achieved could easily tempt one to be less meticulous. Preferably, after making the cross you desire, you should put some kind of tube over the pollinated flower to prevent any second pollination by an unknown donor.

I have found it useful to keep my plants in pots, and as they bloom to bring them into a cool room where there is no draft to inadvertently blow pollen from flower to flower. After pollination, I place a narrow strip of paper, cut wide enough to write what cross has been made, around the stalk of the plant, using some sort of grafting wax or glue that does not damage the plant. After about a week the pollen tubes have grown into the ovary, and there is no risk of double pollination, provided the plant has been protected against insects.

I have come up with a method for keeping the seed in place until it is time to collect them. I make a device I call a seed trap. Sometimes one can get hold of plastic tubes in which hypodermic needles are kept. These tubes can be cut short and be equipped with thin nylon netting on one end. Then hold the tube close to a spirit flame with a wick, rotate the tube until the end has melted and curled a bit, and

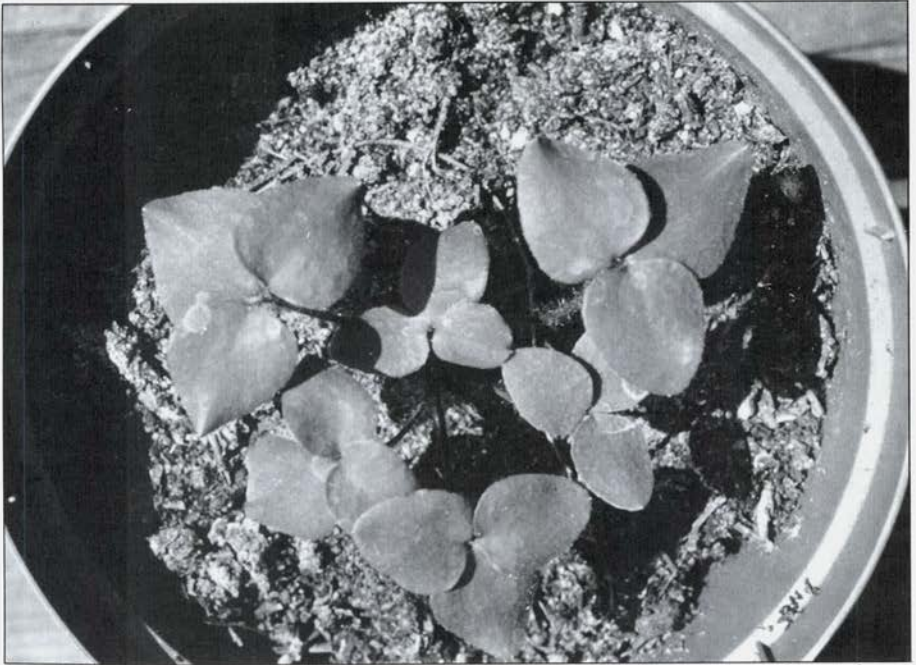


FIG. 3

hold the melted edge firmly against the nylon netting until the plastic has cooled and hardened, fixing the netting in place. Superfluous netting should be cut off. Place the tube over the flower and its stalk with the netted end up. A cork can be cut to fit into the lower end of the tube to act as a stopper and prevent the seed from falling out when it ripens. To give the stalk free play, cut a groove along the cork for the stalk to lie in. Don't use stoppers that cause condensation inside the tube. In this way the seeds can be protected until it is time to sow them.

Pollination technique and sowing

In pollination work, especially when one wants to create a particular hybrid, one must remove the anthers of the flower which is to be supplied with another pollen, to prevent self pollination. This must be done before the anthers "mature," i.e., before they

start to shed pollen. Thus the anthers must be removed at an early stage. Tweezers are effective tools for this purpose. When handling anthers, even if they are not fully open, the tweezers may pinch in the wrong direction, scattering the flower's own pollen on the pistils. If this happens it is of no use to add another pollen without removing the undesired pollen. Hold the flower lightly with your fingers and rinse the stigmas clean again with a suitably strong jet of ordinary clean water from a syringe or sprayer. If this is done immediately, the flower will not yet have been fertilized, and the planned cross can be carried out. But the rinsing must be done at once before the pollen tubes have time to grow.

It is important that hepatica seeds are not exposed to dessication and heat. That lowers germination capacity considerably. Seeds should be sown almost green, and if stored at all or transported they should be kept

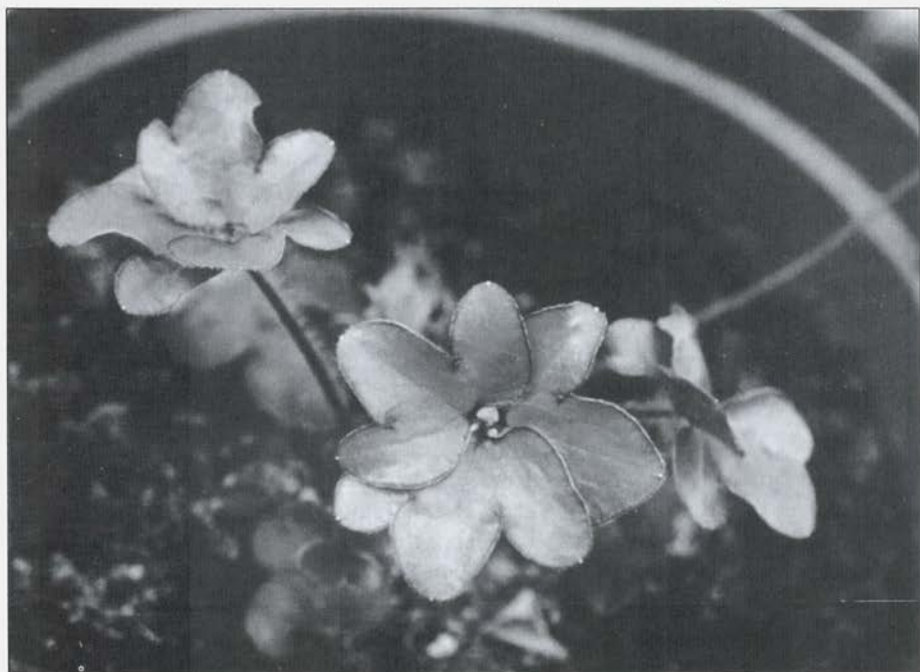
damp. They can be sown on top of the soil or lightly covered with soil. Germination takes six months to a year. A suitable mixture is so-called woodland soil. I myself use roughly two parts pulverized peat, one part of sand, half a part of old, but really well burnt, leaf litter. To about three and a half liters of soil, I add a level table-spoonful of dolomite. The mixture must be stirred until it is homogeneous. To those who are more enthusiastic about sowing seed than they are reliable in watering at the right times, I recommend sowing in large pots.

Do *not* place pots with sown hepatica in the sun! As a safety measure against the soil in the pot becoming waterlogged one can place gravel or small stones along the inner edges of the pot. To those who live in a climate where rain can get into an already frozen pot and cause damage, I recommend the following: bore a hole or cut

FIG. 4

with a cutting wheel a vertical opening on a level with the surface of the earth in the pot, so that water can escape from the surface of the pot. What has been sown is always more important than the pot. With the hole at a slightly lower level than the soil, the water soon drains away. The fresher the seeds are sown, the better the germination rate. Of course, use your own experience as well as my advice.

I hope this article will interest qualified people in continuing to do genetic experiments with these plants. Many of our most appreciated garden plants have at some time been selected. No work with the specific target of producing new and beautiful leaf shapes in hepaticas has, as far as I know, ever been done before. Yet, there is all the potential of beautiful patterns and color forms now seen in cyclamen leaves. It is my fond wish that an American Hepatica Society will now be formed. It would have access to my results, as well as to plant material. In



addition to seeds, every member will receive a two-year-old plant. Anyone who wants a really fresh seed will be able to get one for a small extra fee. Working together we could achieve great results.

Severin Schlyter gardens in Lund, in the southern part of Sweden. The climate is mild, usually above -10°C in winter and no warmer than 25°C in summer. His hybridizing interests also include *Daphne*, *Salix*, *Galanthus*, *Narcissus*, and *Anemone*.

"*Anemone hepatica* is an invaluable, stemless little woodlander of all the alpine woods that our gardens know hardly less well. It luxuriates in damp rich woodland soil, and forms, in time, huge clumps; and it acutely resents being divided and disturbed. It has countless coloured forms, and a very miffy and expensive double white. In the Southern Alps (especially) it seems to develop white marblings and blotchings most becoming to the dark-green leather of its smooth trilobed leaves (*A. triloba* is nothing else). From Eastern Europe comes a glorified form, much larger, much greener, much leafier, and with leaves inclining to pucker into three hollows and then have scalloped edges. This is now raised to specific rank as *A. angulosa*, a recognition to which it is clearly entitled, though here it is more convenient to treat it under *A. hepatica*, of which it has the habits, uses, and needs, though so much bigger in all its parts. The big beautiful blossoms are of Hepaticas's clear blue, but vary to named forms of darker or paler. They both flower with *A. blanda*, or even earlier; though *A. angulosa* tends to be a little later than Hepatica."

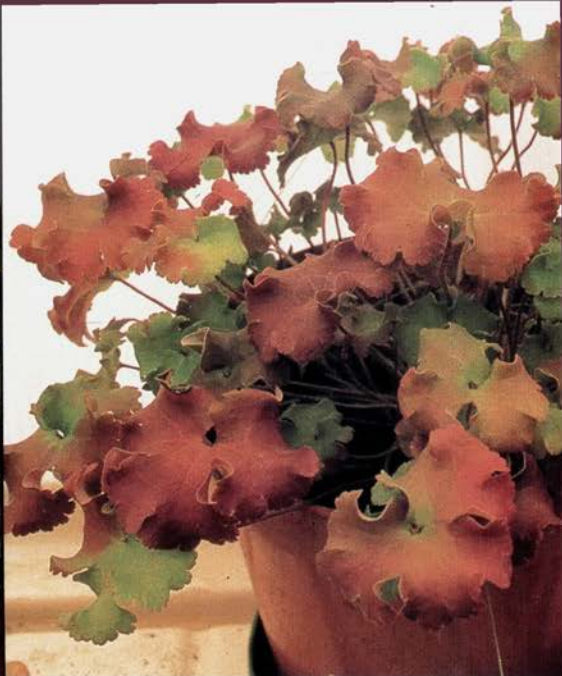
—Reginald Farrer, *The English Rock Garden*, 1919

"*A. hepatica* (*Hepatica triloba*).—This dear little spring friend is as welcome in the garden as it is in the woods, and all whose desire for spring blossoms has a keen edge should encourage these audacious heralds of the new order to linger along the shaded ways of the garden. One is always rejoiced on a blustering March day to come upon the clusters of furry buds nestled at the heart of last year's rustling leaves. There are several colours—white, pink, lavender, and a good blue, strong but tender, and these are the best of all. I have a little bed of blue Hepaticas on the rock garden that is one of my special spring delights."

—Louise Beebe Wilder, *The Rock Garden*, 1935

"*Hepatica nobilis* (*H. triloba*, *Anemone hepatica*) is a blue woodland plant and one of the prettiest of spring flowers. Along with its white and pink forms, it should be planted beside Christmas and Lenten Roses, daphnes, and primulas. The double varieties are rarely seen but they are charming and much sought-after. *H. transsilvanica* (*angulosa*) from Romania is a much stronger grower and flowers two weeks earlier. Both like lime and should be left undisturbed for many years. There are hybrids between them, *H. x media*, of which the form 'Ballardii' has extremely fine, large lavender-blue flowers."

—Wilhelm Schacht, *Rock Gardens*, 1953



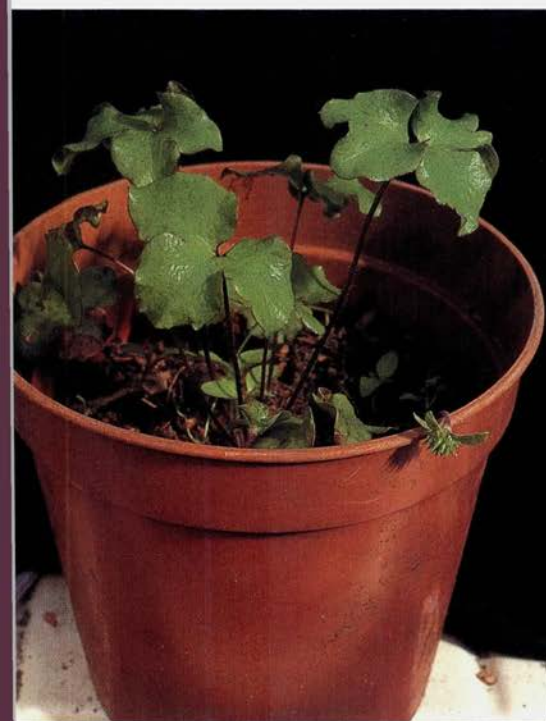
Hepatica nobilis, leaves from cross of G and marble-leaved form

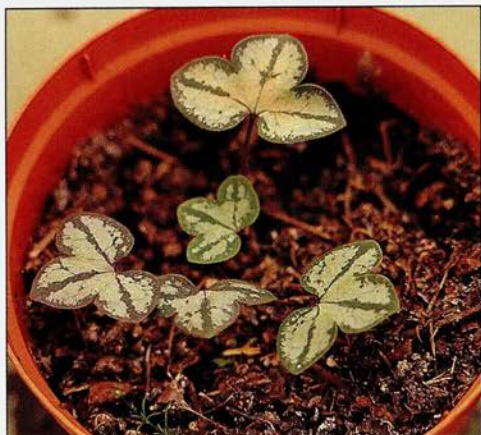
clover-leaf as female parent, crenatilobe as father (p.)

photos, Severin Schlyter

Hepatica nobilis, F1 of K x G

clover-leaf as female parent, crenatilobe as father (p.)



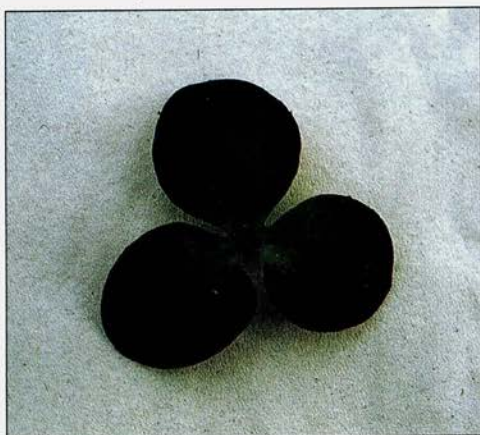


top four photos, *Hepatica nobilis*, variations from Schlyter crosses Paul Held



below, leaves from F1 of G x marbled-leaf parent

below, clover-leaf parent
bottom two photos, Severin Schlyter





Hepatica nobilis, light red flower with yellow pistils and seeds



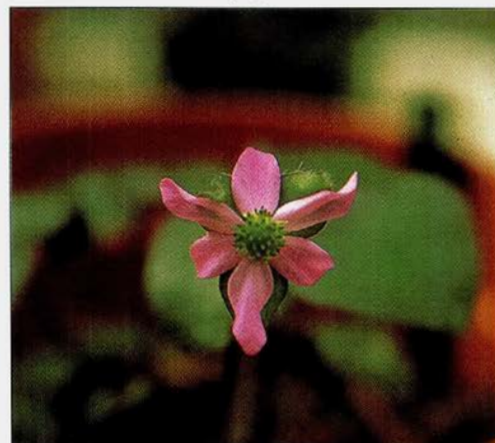
Hepatica nobilis, blue-lilac flower with evenly distributed stamens



Hepatica nobilis, red flowered form with crenulate lobes, marbled leaves (p.)



Hepatica nobilis, blue flower with centered stamens



Hepatica nobilis, completely sterile hybrid



Hepatica nobilis, wild form with red flowers photos, Severin Schlyter



Hepatica nobilis, wild, red-flowered form

photos, Severin Schlyter

Hepatica nobilis, F1 hybrid of K x G



PLANT PORTRAIT

An Unorthodox Use of *Erigeron pulchellus* 'Meadow Muffin'

In their 1988 catalog, Weaver and Duval (We-Du Nurseries) introduced an interesting plant that they had apparently found in the wild, *Erigeron pulchellus* 'Meadow Muffin'. It is a deserving plant for the rock garden and elsewhere and is not at all like the common wild *Erigeron pulchellus* (robins' plantain), which is weedy and a rampant spreader in most situations. Here is the description of 'Meadow Muffin' directly from the We-Du catalog of 1991:

"*Erigeron pulchellus* 'Meadow Muffin' (8-10"); sun or shade; ordinary loam. A wonderful plant, if we do say so. Flowers similar to the normal type, but rosettes unlike anything we have ever seen. Mature rosettes about 4" across, of tightly congested, wrinkled leaves, forming a low mound. Not spreading vigorously like the normal species."

As one might surmise, the plant's greatest asset is the vegetative part, not the flowers. In the garden, I sometimes cut out the branched flowering stem while still undeveloped in order to encourage vegetative growth. Seeds never germinate anyhow in my experience, leading me to suspect a hybrid origin for this plant. The so-called parent plant, *E. pulchellus*, spreads everywhere via seeds as well as runners. 'Meadow Muffin', when happy, reproduces only by stolons and thus is easily controlled.

So far, so good, but what about the unorthodox part? Well, here it is. Because I have sometimes lost the plant outdoors during particularly wet and cold winters (normal here in New England), I have taken to potting up some rosettes and placing them in a cold frame for the winter. This past fall, I also brought one potted plant into the house to grow on in a cool window with full sun. It thrived and was quite attractive as a round, flat rosette. In January, I noted the beginning of a flower stalk in the center of the plant. The central flower bloomed nicely and was located flat on the leaf rosette. Following that, the primary stem elongated with its flower to a total height of about 8" and produced a flower on each of five side stems, making it a most attractive house plant. It was in full bloom by February 10 and stayed in flower well into March, the time of this writing. At present, there appears to be a second flower stalk appearing from the center of the plant.

The discovery that *E. pulchellus* 'Meadow Muffin' makes an attractive and easy house plant was more or less an accident, but it does make this plant much more interesting. It is amusing that, when this plant flowers in the outdoor garden in spring, most growers (myself included) cut off the developing flower stalks and encourage only the vegetative growth, whereas indoors, the flowers are most welcome in the middle of winter. In short, this plant is more adaptable than we thought. Perhaps there are other possibilities for the use of 'Meadow Muffin' that we have not yet invented. It is worth a try to find out.

Just a tangential aside: As someone who grew up in the rural Midwest, I first thought that the name 'Meadow Muffin' was a terrible one for this or any plant. If some city folks don't know what a "meadow muffin" is, please ask someone else to explain it to you. However, after seeing the plant, I quickly changed my mind. Outside of being green and thus the wrong color, it comes about as close to looking like a meadow muffin as any plant could. So, my congratulations to We-Du for coming up with such an apt and amusing name. The plant is so cute in the garden that one would never think of stepping on it any more than one would step on a *bona fide* meadow muffin! Only the reason not to land on it is different.

—C. William Nixon

Heuchera rubescens 'Troy Boy'

We grow plants for our many pleasures—the American genus *Heuchera* for its variety of foliage effects throughout the year in addition to flowers. Whereas the beginner does not see beyond the blossom, he is soon aware of the sustaining foliage as being equally significant, if not more so, since it is there around the calendar year. This larger woodland species of these alum-roots are currently high on popularity charts of perennial and border plant favorites, quite rightly so.

I suppose it was 30 years or so back when my attention got hung up on the smaller western species of this North American genus of Saxifragaceae. First it was with the occasional individual clone, such as the one zonally patterned in the manner of a *Pelargonium* or the one with the ruffled margin or vein pattern. Bob Putnam shared this interest, and together we chose several individuals. Though we did not get many times together in the field, we did have a real lark of a time one summer when with George Schenk when we invaded the northern Rockies of Idaho and Montana, and, yes, we did get alum-roots—on Hollowtop in the Tobacco Root Range.

Over the years, cuttings taken further south in Wyoming and Colorado went to 'Put', as did a collection from Nevada, and with his demise in January of 19..., all these plants went to Grand Ridge Nursery in Issaquah, Washington, where they presently occupy a ground-bed with the bees working them. To this time the possibility of hybrids has not been investigated, as the seed has not been saved nor have spontaneous seedlings appeared.

In this assemblage was the plant gathered in July of 1973 on Troy Peak, Nye County, Nevada, a stocky, vigorous but tiny *Heuchera rubescens* dubbed 'Troy Boy' on the spot, where it packed all the crevices with polsters of typical heuchera foliage, each leaf dentate and held on a half-inch stalk, totally about an inch high, blade and stalk together.

In 1973 a small party set out at the end of June from the Northwest to investigate the Great Basin flora: Sherry Sutton, Jim MacPhail, and Bob Woodward and myself along with Paul Palomino of New York and others who joined for a portion of the circumlocution. One evening in early July we were camped on Cherry Creek in the Quinn Range and set out to ascend nearby Troy Peak, inspired by

Dr. Worth's report of a pink and yellow *Aquilegia* and *Primula nevadensis* on the limestone rim near the summit.

Climbing this old volcanic cone was exhausting; each step forward set you back two as the pumice shifted underfoot. But several hours later we reached the rim and found a scramble-route up onto it, where the primula was making lovely clumps smothered in powder-puff-pink flowers. We did not locate the columbine here on the north side, but every crevice of the limestone was burgeoning with the rich green herbage of 'Troy Boy'. It has become a favorite of crevice and trough gardeners, staying green through the seasons with only a degree of fading from its billiard-cloth hue and closely packed so that fresh leaves conceal any that are going over. 'Troy Boy' is thus the tiniest and tidiest of alum-roots, totally only a few inches high and quite rapidly spreading by a rhizome, with flowers moderately pink to distinctly so.

Heuchera rubescens Torrey is an extremely complex aggregate of macrospecies to which ten or a dozen taxa relate, some as varieties, others as distinct but near-related species, all needing monographic opinion. The lot of them occurs in the Southwest, from Texas to California and north to central Oregon, probably into northern Mexico, its congeners intergrading freely.

—B. LeRoy Davidson



NORTH AMERICAN ROCK GARDEN SOCIETY

Join Today!

Benefits of Membership Include:

Beautiful, Colorful Quarterly Bulletin; Seed Exchange offering Thousands of Species of Seed at Low Prices; Spectacular National Meetings; Meet Fellow Gardeners

Send \$25 to: Jacques Mommens, Executive Secretary, PO Box 67, Millwood, NY 10546

THE ALPINE GARDEN SOCIETY

Membership of the Alpine Garden Society puts the American Alpine gardener in close touch with those throughout the world who share his interest in one of the most absorbing branches of horticulture.

The Quarterly Bulletin of the A.G.S. is respected internationally as one of the most informative publications of its kind. It will bring into your home a distillation of the experience and ideas of some of the finest gardeners, plant explorers, and horticultural thinkers of our time.

Among the many other benefits of the Society, its uniquely comprehensive seed list alone is worth more than the modest subscription of \$32.00 US. For Overseas Members Apply to:

The Secretary, The Alpine Garden Society

AGS Centre, Avon Bank, Pershore, Worcestershire WR10 3JP, England



NARGS COMING EVENTS

ANNUAL MEETING

Springtime in the Berkshires

June 2, 3, & 4, 1995

Pittsfield Massachusetts

at the Berkshire Hilton Inn, sponsored by the Berkshire Chapter.

Speakers:

Tass Kelso, Geoffrey Charlesworth, John Spain, Jim Archibald.

Two full days of garden visits:

the Berkshire Trail tour—the colonial garden of Maryjane and Carl Beach, the historic rock garden at Smith College, and the hilltop forest garden of Clifford Desch; the Berkshire and Litchfield Hills tour—the extensive hilltop garden of Norman Singer and Geoffrey Charlesworth, the sparkling hillside garden of Ruth and Herbert Sheppard, and the unique hillside moraine of John Spain.

This full weekend includes a Plant Show and Plant and Book Sale. Mark your calendars now. Don't miss this opportunity. Look for our brochure in the winter *Bulletin* or write for advance information to:

Shirley Redington, Registrar, 1169 Mohawk Road, Schenectady NY 12309-1607

ROCKY MOUNTAIN ALPINE FLOWER TOURS '95

BIG HORN MTNS. OF WYOMING

JUNE 14 - 21

IDAHO MTNS.

JULY 3 - JULY 10



**Martin & Betty Falxa, North American Rock Garden Society-NE
New England Wildflower Society**

Alpine Tours, 12 Chesley Avenue, Newtonville, MA 02160 (617) 969-6531

There is still time to grow wonderful plants from seed this year!

High quality garden and wild collected seed from Tien Shan, Turkey, Alps and Pyrenees: Acantholimon, Androsace helvetica, Androsace sericea and 16 other species androsaces, Callianthemum alatavicum, Campanula alpestris, C. cenisia, C. hakkiarica, C. zoyssii and 15 other campanula species, Chorispora bungeana, Daphne kosaninii, Gentiana bavarica v. subcaulis, G. boissieri and 13 other species gentians, Hegemone lilacina, Lagopis marubiastrum, Paraquilegia grandiflora, Physoplexis comosa, Primula turkestanica, Ramonda serbica, Ranunculus gelidus, Saussurea gnaphalodes, Waldheimia tridactylites, etc. Prices U.S. \$1-4 per packet.

Karmic Exotix Nursery

Box 146, Shelburne, Ont. L0N 1S0
Canada

Illustrated catalogue, U.S. \$2
Credited on order

Remember...

March 1, 2 & 3, 1996

WESTERN

WINTER STUDY WEEKEND

VICTORIA, B.C.

Hosted by:

**VANCOUVER ISLAND ROCK &
ALPINE GARDEN SOCIETY**



**NORTH AMERICAN
ROCK GARDEN
SOCIETY**

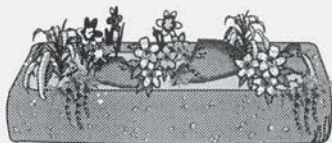
Join Today!

Benefits of Membership Include:

Beautiful, Colorful Quarterly Bulletin; Seed Exchange offering
Thousands of Species of Seed at Low Prices; Spectacular
National Meetings; Meet Fellow Gardeners

Send \$25 to: Jacques Mommens, Executive Secretary,
PO Box 67, Millwood, New York 10546

Trough In A Box



Make your own trough-
A complete kit that includes mix
& form - just add water.

Exciting new mix ingredient-STALITE
A high performance lightweight aggregate.

13 x 8 1/2 x 5 1/2

\$25 + postage

MC & Visa accepted
NC Residents add state tax

Dorothy Bonitz
Herb & Flower Thyme
146 Great Oak Dr.
Hampstead NC 28443



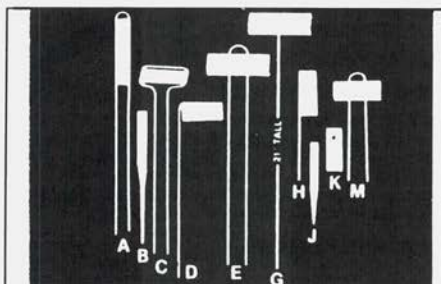
You are cordially invited to join the

**American
Rhododendron
Society**

Annual Subscription of \$25 (U.S.A.)

Benefits: quarterly journal,
seed & pollen exchange,
chapter affiliation, conventions.

Dues may be sent to:
Barbara Hall, Executive Secretary
P.O. Box 1380
Gloucester, VA 23061 USA



THE PERMANENT METAL LABEL

- A- Hairpin Style Markers 30 for \$12.60
- B- Plant or Shrub Labels 100 for \$8.70
- C- Cap Style Markers 30 for \$13.00
- D- Swinging Style Markers 30 for \$11.40
- E- Rose Markers 30 for \$11.90
- F- Tall Display Markers 30 for \$15.20
- G- Tall Single Staff Markers 30 for \$12.90
- H- Flag Style Markers 30 for \$10.95
- J- Small Plant Labels 100 for \$8.25
- K- Tie-on Labels 100 for \$13.30
- M- Miniature Markers 30 for \$11.00

PO Box 93-E, Paw Paw, MI 49079-0093
 Quantity Prices Available
 Prices Include Prepaid Postage



Send 1st Class Stamp
 for Descriptive Price List

EARTHWORKS continues... the
 Tradition and Fun
 of



- Handcast Geometric & Basin-Style Planters for Rock/Patio Gardeners
- Choose from Granite, Chalk, or Jasper
- Lightweight, Porous Hypertufa. Plus Sealed Troughs for Bog or Water Garden Accents!
- Shipped Throughout the U.S. and Canada

P.O. BOX 67 • HYATTVILLE, WY 82428

HANSEN NURSERY



Species Cyclamen

grown from cultivated stock

WHOLESALE/RETAIL MAIL ORDER
 Plant List SASE

Visitors Welcome by Appointment

ROBIN L. HANSEN

P.O. Box 446
 (503) 678-5409 Donald, OR 97020

Join the **American Hepatica Association**



- Access to seed hybrids which took 15 years of creative efforts to develop.
- Receive ephemeral seed when ripe without delay.
- Newsletter showing developments.
- Seed collection devices that guarantee plentiful seed for all.

Paul Held - 195 North Avenue
 Westport, CT 06880 - US \$20

**THE AMERICAN
 DIANTHUS SOCIETY**

Since 1990, hot info on pinks, carnations, sweet williams & tribe. Dues (US funds): \$15/yr US; \$18/yr Can/Mex; \$20/yr elsewhere. Free brochure, sample quarterly newsletter featuring *The Dianthus Encyclopedia*: 52¢ stamp to Rand B. Lee, PO Box 22232, Santa Fe NM 87502. *Dianthus in horto omni!*



PERENNIAL SEEDS

from professional to professional

We offer a very comprehensive assortment of over 2000 varieties

Send \$5.- for our catalogue

P.O. Box 1264
 D-29685 Schwarmstedt, Germany

Telephone: 01149-5071-4085

Fax: 01149-5071-4088



Hypertufa Troughs

*Handcrafted with the look
of weathered stone*

Mail Order U.S. Only

For Further Information
Send SASE

KAREN HARRIS
200 East Genesee St.
Fayetteville, NY 13066

CHEHALIS RARE PLANT NURSERY
2568 Jackson Hwy., Chehalis, WA 98532
Herb Dickson, Prop.

After many years of selecting and breeding, I just may now have the world's best garden auricula seed.

Garden Auricula - 75 seeds per pack

Mixed	Brown	Yellow
Red	Blue	Picotée
White		Petite Hybrids

Exhibition Alpine - 75 seeds

Hand pollinated Double Auricula
25 seeds

Hand pollinated Show Auricula
25 seeds

Red Self, Yellow Self - Green Edge

Primula Florindae - 150 seeds or more

All packets \$2.00 each
.50 cents postage & handling in U.S. & Canada
Other foreign orders \$1.00 postage & handling
Washington residents add 7.6% sales tax
MINIMUM ORDERS 3 packets

The Rugged BEAUTY of NEWFOUNDLAND

Walk THROUGH ALPINE MEADOWS, HIKE THE EERIE,
ALIEN LANDSCAPE CALLED THE TABLELANDS.

SEE WHALES, MOOSE, CARIBOU;
GANNET & puffin colonies;
THE fjords of GROS MORNE.
STAY AT LOCAL INNS

TREAD LIGHTLY LIMITED®

World Travel to Enrich Your Mind
and Awaken Your Senses

Weekly DEPARTURES July & AUGUST FROM \$650 U.S.
CUSTOM, FAMILY-PRICED ITINERARIES AVAILABLE.

Call for information: 800-643-0060
203-868-1710

Washington Depot, CT 06794

Under The Milky Way

Day and Night Flowering
Perennials • Wildflowers • Ferns
Small Native Plant Material

Write for Free Plant List

NATURE'S GARDEN

40611 Hwy 226
SCIO, OREGON 97374-9351

COLLECTORS DWARF BULBS

Our catalogue contains many old favorites
for Garden and Alpine House.

In addition, we offer numerous rare and
new introductions.

Full and Descriptive Catalogue \$3.00

POTTERTON & MARTIN

Nettleton, Nr. Caistor, North Lincs.
LN7 6HX, ENGLAND
Tel/Fax 44-1472-851792



SISKIYOU RARE PLANT NURSERY

An ever growing collection of over 1,000 varieties of Alpines, Ferns, Dwarf Conifers, Northwest Natives (as *Lewisia cotyledon*, pictured), and other hardy plants for the Woodland and Rock Garden. For our Annual Mail Order Catalog and Fall Supplement send \$2.00 refundable.

Dept 1, 2825 Cummings Road, Medford, Oregon 97501

Visitors Welcome by Appointment - Phone (503) 772-6846

SHIPPING TO U.S. and CANADA ONLY

PERENNIALS, WILDFLOWERS,
ROCK GARDEN PLANTS,
CONIFERS, FLOWERING SHRUBS

over 1,000 varieties available at our nursery

Sam Bridge Nursery N' Greenhouses

437 North Street, Greenwich, Conn. 06830
(203) 869-3418

SORRY, NO SHIPPING

SANGUINARIA CANADENSIS MULTIPLIX (DOUBLE BLOODROOT)

Blooming-Age Rhizomes

Available in Early September

MINIMUM ORDER ONE DOZEN

CHARLES F. ANDROS
BOULDER WALL GARDENS
McLEAN ROAD
WALPOLE, NH 03608-0165



Phone (603) 756-9056
(April 15 - November 15)

A Distinguished Collection

Over 1500 hard to find
and useful varieties

ROSLYN NURSERY

211 BURRS LANE, DEPT R
DIX HILLS, N.Y. 11746

Descriptive mail order catalog
\$3.00



**Serious Collectors
can find genuine,
personalized service for...**

- rare and dwarf conifers
- alpine and rock garden perennials

Catalogue \$4.00
(refundable with first order)



PORTERHOWSE FARMS

41370-R S. E. Thomas Road, Sandy, Oregon 97055
Telephone/ Fax (503) 668-5834

The Bovees Nursery

Vireya (tender) Rhododendrons
Species Rhododendrons
Rock garden Plants
We ship, catalog \$2.00
Visa & Mastercard

1737 SW Coronado
Portland, Oregon, 97219
503-244-9341 1-800-435-9250

"ALPINE FLOWERS, GARDENS AND WALKING TOUR"

JUNE 25 - JULY 9, 1995

Walk the flower strewn high meadows of Switzerland during peak blooming season, photographing flowers and scenery too. Visit Alpine and Botanical gardens, stay in Murren, Adelboden, Zermatt, Locarno & Lucerne. For information, 1-800-227-ALPS, Nash Travel Tours Inc, 23 James St, Danielson, CT 06239.



TRENNOLL

SEND FOR OUR SPECIAL LIST

Unusual Rock Plants, Shade Plants, Hosta, Perennials, Geraniums, Iris species, Phlox species, Succulents, Thymes, Wildflowers, and Seed List.

MAIL ORDER
List \$1.00

TRENNOLL NURSERY

Jim and Dorothy Parker
3 West Page Ave., Trenton, OH 45067-1614
1-513-988-6121

Mt. Tahoma Nursery

Alpines for the Enthusiast

Rick Lupp (206) 847-9827
Alpines, Washington State
Natives, Species Primulas, Troughs
and Trough Plants
Dwarf Shrubs

Nursery open weekends and by
appointment

Send \$1.00 For List
28111-112th Avenue E., Graham,
Washington 98338

THE PRIMROSE PATH

R.D. 2 Box 110 Scottdale, PA 15683

Choice and unusual perennials, alpines, woodland plants, all nursery-propagated. Specializing in new hybrids and selections from our breeding program, species Primulas and Phlox, native wildflowers, western plants adaptable to the East.

Mail-order Catalog \$1.50 (412) 887-6756



Primula veris

SOUTHERN ALPINES CONFERENCE NEW ZEALAND TOUR

December 30, 1995 - January 17, 1996

Fully escorted tour on North and South Islands. Includes visits to private and public alpine gardens, botanizing in Tongariro National Park and Old Man Range, scenic highlights, farmstay and sightseeing tours. Pre and post conference options.

For information call Jan Coyle, NZ Garden Tour Specialist 415 595 2090

ROCK PLANTS

For over 20 years we have specialized in dwarf Rhododendrons, Azaleas and dwarf conifers. We also have one of New England's largest selections of rare specialty Alpines, perfect for the trough or rock garden.

Free 200-page catalog when you visit us.

To send for catalog, include \$5.00

Oliver
NURSERIES, INC.

1159 Bronson Road, Fairfield, CT. 06430
(203) 259-5609 (Sorry we do not mail order.)



EXCITING PLANTS FROM AROUND THE WORLD
TREES, SHRUBS, PERENNIALS, & VINES

COLLECTOR'S NURSERY

CATALOG \$2.00

(206) 574-3832
COLLECTOR'S NURSERY
16804 NE 102nd Ave.
Battleground, WA 98604

ALL PLANTS NURSERY PROPAGATED

茶
花
林



Hardy Camellia
Dwarf Conifers
Rare Asian Trees
and Shrubs

Catalog: \$1.00

CAMELLIA
FOREST
NURSERY

125 Carolina Forest Road
Chapel Hill, N.C. 27516



We ship almost anywhere...

hardy heaths & heathers for all-year color in the garden.

Heaths & Heathers
Box 850, Elma, Wa. 98541
(206) 482-3258

SEND S.A.S.E. FOR FREE LIST.
NURSERY VISITORS WELCOME!

Rock Spray Nursery inc.

P.O. Box 693 Truro MA 02666
Garden Shop on Depot Rd.

New England grown Heather

We grow the hardy cultivars of Calluna and Erica in 4", 5 1/2" and 1 gallon pots. Excellent availability of cultivars selected for their unique foliage and flower color. Visit our garden shop April-Oct. We ship UPS the year-round! Wholesale-Retail

Color catalog loaded with all the information you will need in selecting plants for your garden only \$1.00. (508) 349-6769

THE SEED GUILD

A Scottish company, formed in 1994, to act as a clearing house for surplus seed from Botanic Gardens worldwide.

The scheme provides the Botanic Gardens with a welcome source of income and gives the adventurous gardener, on a share basis, seed not generally available to the public.

Some gardens, eg Siberia, will also supply seed from their expeditions to areas of interest.

For further details and a sample packet of seed send \$3 in bills to cover postage to:

The SEED Guild, PO Box No 8951,
LANARK, Scotland, ML11 9JG.



THE COMPLEAT GARDEN CLEMATIS NURSERY

MAIL ORDER CLEMATIS

Unusual and Hard-To-Find Varieties

Small and Large Flowered

In Pots

Wide Selection

Descriptive Listing \$2.00

217 Argilla Road
Ipswich, MA 01938-2614

Rocky Mountain Gardener

*The only magazine exclusively for gardeners
in the Rocky Mountain States*



*We cover topics such as growing wild-
flowers, cold hardy cactus, alkaline soils,
tree and shrub varieties, low water land-
scaping, short season gardening, envi-
ronmental issues, composting, visiting
gardens, tips from experts
and more!*

For a one year subscription (4 seasonal issues)
send \$12. Two years - \$20.

Samples available for \$4. Send payment to:
RMG, PO Box 1230, Gunnison, CO 81230.

PETITE ALPINES LOW-GROWING PERENNIALS

Some choices are: *Allium cyaneum*, *Arabis androsacea*, *Dryas octopetala* 'Minor', *Gypsophila nana*, *Hylomecon japonicum*, *Iris gracilipes*, *Primula modesta alba*, *Saponaria x olivana*, *Woodsia polystichoides*, and a variety of other favorites.

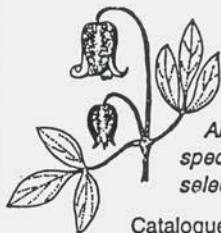
WOODLAND ROCKERY

6210 KLAM ROAD
OTTER LAKE, MI 48464

ALL PLANTS NURSERY PROPAGATED

SHIPPING WITHIN USA ONLY

MAIL ORDER CATALOG \$1.00



WE-DU NURSERIES

A SPECIALTY NURSERY WITH AN INTERNATIONAL REPUTATION,
FEATURING:

American and Asiatic wildflowers; unusual perennials; rockery plants; species iris and daylilies; ferns and fern relatives; hardy and tender bulbs; select wildflower seeds. All nursery propagated.

Catalogue \$2.00, refundable with first order. No shipments to CA, AZ, or HI.

We enjoy having visitors; please call ahead for directions and hours.

Rte. 5, Box 724, Marion, NC 28752-9338

Tel. (704) 738-8300

JOY CREEK NURSERY

Unique and Unusual Plants

Large Selection of Rock and
Wall Garden Plants Including
Penstemons, Salvias, Dianthus,
Scutellarias, and Meconopsis

Catalogue: \$2.00 – Refundable With Purchase

20300 N.W. Watson Road, Bin 1 – Scappoose, OR 97056



*for a complimentary copy of our brochure
A Brief Look at Garden Conifers*

send a self-addressed, stamped envelope to

American Conifer Society

827 Brooks, Ann Arbor, MI. 48103-3161

PH: (313) 665-8171 U.S. Membership \$25.00 FAX (313) 665-8720

THE CUMMINS GARDEN

DWARF RHODODENDRONS Yes, We Ship!
DECIDUOUS AZALEAS Catalog \$2.00
DWARF EVERGREENS
COMPANION PLANTS (Refundable With Order)

Phone (908) 536-2591
22 Robertsville Road Marlboro, NJ 07746

WOODLANDERS

NURSERY GROWN TREES, SHRUBS,
PERENNIALS,
SOUTHERN NATIVES & EXOTICS

Please send \$2.00 for mail-order list

WOODLANDERS, DEPT. RG
1128 COLLETON AVENUE
AIKEN, SC 29801

Pacific Horticulture

a magazine about
plants and gardens of the west

illustrated color quarterly

annually, in US currency: US \$15;
Canada & Mexico \$18; overseas \$20
write to:
Circulation Department
PO Box 680, Berkeley, CA 94701

Wildflowers of the Southern Appalachians

Choice, hardy, reliable, showy.

FROM OUR NURSERY TO YOUR GARDEN
be it woodland, rock, moist or dry.

Send \$3 for 2-yr. subscr. to illustrated descriptive
catalog of wildflowers, hardy ferns and perennials

Sunlight Gardens

174-R5 Golden Lane
Andersonville, Tenn. 37705



LEWISIA

- 22 species and hybrids
- wide variety of flower colors
- international orders accepted
- retail, wholesale

Send \$2 or SASE to:

Rare Plant Research 13245 SE Harold
Portland, OR 97236 USA FAX (503) 762-0289

THE ALPINE GARDEN SOCIETY

Membership of the Alpine Garden Society puts the American Alpine gardener in close touch with those throughout the world who share his interest in one of the most absorbing branches of horticulture. The Quarterly Bulletin of the A.G.S. is respected internationally as one of the most informative publications of its kind. It will bring into your home a distillation of the experience and ideas of some of the finest gardeners, plant explorers, and horticultural thinkers of our time. Among the many other benefits of the Society, its uniquely comprehensive seed list alone is worth more than the modest subscription of \$32.00 US. For Overseas Members Apply to:

The Secretary, The Alpine Garden Society
AGS Centre, Avon Bank, Pershore, Worcestershire WR10 3JP, England



N · A · R · G · S BOOKSTORE

BOOKS

Most books are 80% of list price

Alliums, by D. Davies - Paperback or Hardback	\$18.00, \$24.00
Alpine Gardening*, by R. Elliott	\$20.00
The Alpine House*, by R. Rolfe	\$22.00
Alpines*, by W. Ingwersen	\$45.00
Alpines in Sinks and Troughs, by Joe Elliot	\$5.00
Alpines the Easy Way, by Joe Elliot	\$6.00
Alpines: The Illustrated Dictionary*, by C. Innes, Due in July, '95	\$32.00
AMC Field Guide to the Mountain Flowers of New England - NEW	\$12.00
AMC Field Guide to the New England Alpine Summits , by N.G. Slack - NEW	\$10.50
A Field Guide to Alpine Plants of New Zealand	\$27.00
Border Pinks*, by R. Bird	\$24.00
Botany for Gardeners, 2nd Ed., by B. Capon	\$13.00
A Century of Alpines, by AGS	\$22.00
Clematis*, by B. Fretwell - NEW	\$20.00
Clematis*, by C. Lloyd - NEW	\$26.00
Colorado Flora - E. Slope and W. Slope, 2 vols., by W.A. Weber, each	\$22.00
Dictionary of Plant Names*, by A.J. Coombes	\$8.00
Encyclopaedia of Ferns*, by D.L. Jones	\$48.00
Encyclopedia of Alpine Flowers, 2 vols.*, by AGS	\$280.00
Ferns for American Gardens*, by J. Mickel - NEW	\$48.00
Field Guide to Alaskan Wildflowers, by V. Pratt	\$10.00
Forest Wildflowers, by D. Strickler	\$7.25
A Garden of Conifers, by R.A. Obrizok	\$20.00
A Gardener Obsessed*by G.B. Charlesworth - NEW	\$20.00
The Gardeners Guide to Growing Lilies*, by M. Jefferson-Brown & H. Howland - NEW	\$24.00
Gardening and Beyond, by F. Bellis	\$12.00
Gardening with Native Wildflowers*, by S.B. James & L.E. Foote	\$25.00
The Genus Cyclamen*, by C. Grey-Wilson	\$22.00
The Genus Primula, by J. Halda Now Just	\$20.00
Growing & Propagating Showy Native Woody Plants, by R.E. Bir	\$15.00
Growing & Propagating Wildflowers, by H.R. Phillips	\$13.50
Guide to Flowering Plant Families, by W. Zomlefer, Paperback or Hardback.	22.00, \$44.00
Guide to Locating Rocky Mt. Wildflowers	\$4.00
Handbook on Rock Gardening, by BBG, M. Flook, Ed.	\$3.00
Handbook on Rock Gardening, by J. Good, Ed.	\$10.50
Hardy Geraniums*, by P.F. Yeo	\$32.00
Hardy Herbaceous Perennials* , 2 Vols., by L. Jellito & W. Schacht	\$100.00
Hillier's Guide to Connoisseur's Plants*, by A. Toogood	\$31.00
Iris*, by F. Koehlein	\$30.00
The Iris*, by B. Mathew	\$27.00
Iris of China*, by J. Waddick & Zhao Y.	\$23.00
Landscaping for Water Conservation: Xeriscape, by K. Knox, Ed.	\$4.00
Lilies of China*, by S.G. Haw	\$24.00
Manual of Cultivated Conifers*, by G. Krössman	\$52.00
Manual of Grasses*, by F. Drake, Ed. - NEW	\$32.00
Manual of the Vascular Flora of the Carolinas*, by A. Radford, et al.	\$24.00
Maples of the World*, by D.M. van Gelderen, et al.	\$48.00
Meconopsis*, by J.L.S. Cobb	\$23.00
Modern Miniature Daffodil Species and Hybrids*, by J. Wells	Was \$26, now
	\$17.00



N · A · R · G · S BOOKSTORE

Mystery Rivers of Tibet, by F. Kingdon-Ward	\$8.00
Orchids of the Western Great Lakes*, by F. Case.....	\$26.00
A Patchwork Garden, by S. Eddison - NEW	\$10.00
The Peony*, by A. Harding	\$24.00
Perennials, Vol.1 & Vol. 2, by R. Phillips & M. Rix, each	\$20.00
Pests and Diseases of Alpine Plants*, by P.R. Ellis et al.....	\$36.00
The Plant Explorers Guide to New England, by R. Wiggers - NEW	\$14.50
Plant Hunting on the Edge of the World, by F. Kingdon-Ward	\$8.00
Plant Propagation Made Easy, by A. Toogood	\$13.00
Plants for Problem Places*, by G. Rice.....	\$18.00
Pool & Waterside Gardening*, by P. Robinson - Soon unavailable	\$16.00
Poppies*, by C. Grey-Wilson.....	\$26.00
Primula*, by J. Richards.....	\$40.00
Primulas of Europe & America*, by G.F. Smith, et al. Was \$30, now	\$20.00
Propagation of Alpine Plants & Bulbs*, by B. Halliwell	\$20.00
RHS Index to Garden Plants*, by M. Griffiths.....	\$48.00
Rock and Alpine Gardens, by T. Everett	\$3.00
Sedum: Cultivated Stonecrops*, by R. Stephenson.....	\$40.00
Seeds of Wildland Plants*, by J.A. Young & C.G. Young	\$20.00
Succulents: The Illustrated Dictionary*, by M. Sajeva & M. Costanzo	\$32.00
Synoptic Guide to the Genus Primula*, by G.K. Fenderson.....	\$32.00
A Utah Flora*, by Welsh, et al. NEW EXPANDED EDITION.....	\$65.00
Wild Flowers of North Carolina, by W.S. Justice & C.R. Bell.....	\$14.00
Wildflowers along the Alaska Highway, by V. Pratt	\$16.00
Wildflowers of Denali National Park, by V. Pratt.....	\$13.00
Wildflowers of SW Utah, by H. Buchanan.....	\$6.00
The World of Magnolias, by D. Calloway.....	\$36.00

* denotes hard cover

Following items are postage paid.

ARGS Note Paper	\$4.75
Decal—ARGS Dodecatheon—specify glue on front or back.....	\$0.75
ARGS Shoulder Patch.....	\$1.00
Plant drawings by L.L. (Timmy) Foster (3 different sets, each set contains 12 drawings) \$12.00 for one set, \$22.00 for 2 sets, \$30.00 for 3 sets	
BACK ISSUES OF THE ARGS BULLETIN, ROCK GARDEN QUARTERLY	
Last 4 issues, \$7.00 each; 1990-Winter 1994 issues, \$5.50 each; 1943-1989 issues, \$1.50 each, \$5.00, by year, (some issues unavailable)	

Please mail inquiries and orders to:

Ernie O'Byrne, North American Rock Garden Society Bookstore
86813 Central Road, Eugene, OR 97402 USA

Please print name and address clearly. Country of origin and postal code must be included. Allow 8-12 weeks for overseas shipment. Orders must be prepaid in US dollars by check on a US bank or by intl. money order (VISA and MC accepted—include signature, date of exp., and full acct. #). Add postage and handling

First Book, US	\$3.00
Each Additional Book.....	\$1.50
First Book Outside US	\$5.00
Each Additional Book abroad	\$2.50

This is a partial listing. For additional titles, see previous bulletins, or write.

CHAPTER CHAIRPERSONS

Adirondack	Bill Plummer, 10 Fox Lane East, Painted Post, NY 14870
Allegheny	Al Deurbrouck, 6915 Hilldale Drive, Pittsburgh, PA 15236
Berkshire	Anne Spiegel, 73 Maloney Rd., Wappingers Falls, NY 12590
Calgary/Alberta	Sheila Paulson, 6960 Leaside Dr., SW, Calgary, Alberta, Canada
Columbia-Willamette	Don Howse, 41370 SE Thomas Road, Sandy, OR 97055
Connecticut	Sylvia Correia, 27 Lynn Dr., Preston, CT 06365
Delaware Valley	Mike Slater, RD 4, Box 4106, Mohnton, PA 19540
Emerald	Marietta O'Byrne, 86813 Central Rd., Eugene, OR 97402
Gateway	June Hutson, 10601 Knollside Circle, St. Louis, MO 62123
Great Lakes	Richard Punnett, 41420 Harris Rd., Belleville, MI 48111
Hudson Valley	Thomas Stuart, PO Box 517, Croton Falls, NY 10519
Long Island	Shelley Herlich, 43 Greenfield Lane, Commack, NY 11725 Fred Knapp, 58 Kaintuck Lane, Locust Valley, NY 11560
Manhattan	Lawrence Thomas, 340 E. 74th, #11G, New York, NY 10021
Minnesota	Steve Roos, 311 Sunnysdale Ln. S.E., Rochester, MN 55904
Mt. Tahoma	Steven Hootman, PO Box 3798, Federal Way, WA 98003
New England	Stuart Sotman, 73 Mt. Vernon St., West Roxbury, MA 02132
Newfoundland	Bodil Larsen, Box 50517, SS#3, St. John's, Newfoundland A1B 4M2
Northwestern	Judith Jones, 1911 Fourth Ave. W., Seattle, WA 98119
Ohio Valley	Barbara Ablor, 990 Blind Brook Dr., Worthington, OH 43235
Ontario	Barry Porteous, 3 Breda Ct., Richmond Hill, Ont. L4C 6E1 Canada
Ottawa Valley	Lois Addison, 201 Wagon Dr., Box 9015, RR 1 Dunrobin, Ont. KOA 1T0 Canada
Piedmont	Norman Beal, 2324 New Bern Ave., Raleigh, NC 27708
Potomac Valley	Robert Faden, 415 E. Mason Ave., Alexandria, VA 22301
Rocky Mountain	Andrew Pierce, PO Box 2078, Evergreen, CO 80439
Shasta	Fai Schwarzenberg, 7800 French Creek Rd., Etna, CA 96027
Siskiyou	Christine Ebrahimi, 2844 Fredrick Dr., Medford, OR 97504
Southern Appalachian	Furman (Frank) Strang, 105 Albany Rd., Oak Ridge, TN 37830
Watnong	Richard Hartlage, 300 Longview Rd., Far Hills, NJ 07931
Wasatch	Bruce Grable, 2166 Wellington, Salt Lake City, UT 84106
Western	Sean Hogan, 607 Brooklyn Dr., Oakland, CA 94606
Wisconsin-Illinois	Allen Blaurock, 9449 Lincolnwood, Evanston, IL 60203

QUARTERLY STAFF

Editor	Gwen Kelaidis (303) 368-7530 7530 E. Mississippi Dr., Denver, Colorado 80231-2504
Advertising Manager	Al Deurbrouck (412) 653-0281 6915 Hilldale Drive, Pittsburgh, Pennsylvania 15236
Proofreading Assistants	Barbara and Ted Cochrane, Madison, Wisconsin Bernice Petersen, Littleton, Colorado Anne Spiegel, Wappingers Falls, New York
Editorial Advisors	Grazyna Grauer, Columbus, Ohio Rochelle Herlich, Commack, New York Faith Magoun, Manchester, Massachusetts
Guest Artists	Cindy Nelson-Nold Lynn Janicki Rebecca Day-Skowron David Ferguson Panayoti Kelaidis Randy Tatroe Paul Held Severin Schlyter

OFFICERS

President	James L. Jones 45 Middle Street, Lexington, MA 02173	(617) 862-9506
Vice President	Patricia Bender 4123 NE 186th Street, Seattle, WA 98155	(206) 364-1561
Recording Secretary	Alice Lauber 18922 45th Place NE, Seattle, WA 98155	(206) 363-7357
Treasurer	Robert Mills 150 Prospect Avenue, Princeton, NJ 08540	(609) 924-5003
Administrative Director-at-Large	Joann Knapp 58 Kaintuck Lane, Locust Valley, NY 11560	(516) 671-6590
Immediate Past President President Emeritus	Norman Singer, North Sandisfield, Massachusetts Harold Epstein, Larchmont, New York	

DIRECTORS OF THE BOARD

1992—1995	Panayoti Kelaidis, Denver, Colorado Margery Edgren, Woodside, California Ev Whittemore, Penrose, North Carolina
1993—1996	Joann Knapp, Locust Valley, New York Bobby Wilder, Raleigh, North Carolina Lawrence Thomas, New York, New York
1994—1997	Brian Bixley, Toronto, Ontario, Canada Jack Ferreri, Verona, Wisconsin Micheal Moshier, Seattle, Washington

Managers

Executive Secretary	Jacques Mommens PO Box 67, Millwood, NY 10546	(914) 762-2948
Seed Exchange	Elisabeth Harmon 75 Middlebury Road, Watertown, CT 06795	(203) 274-0290
Bookstore	Ernest O'Byrne 86813 Central Road, Eugene, OR 97402	(503) 935-3915
Archivist	Marnie Flook 23746 Lovely Lane, Chestertown, MD 21620	(410) 778-4038
Slide Collection	William Plummer 10 Fox Lane East, Painted Post, NY 14870	(607) 962-2640
Library	Janet Evans, c/o Pennsylvania Horticultural Society, 325 Walnut Street, Philadelphia, PA 19106	

You are invited to join the North American Rock Garden Society. Membership includes a subscription to *Rock Garden Quarterly* and participation in the seed exchange, as well as other benefits. Annual dues: US \$25; UK £17; Canada \$32. Payment by check on a US bank, International Money Order, VISA, MC, or check in appropriate currency from country listed above. General Membership, \$25 (domestic or foreign, single or joint); Patron, \$75; Life Member, 40-59 years old, \$500; over 60 years old, \$450. Membership inquiries and dues should be sent to Executive Secretary, NARGS, PO Box 67, Millwood, NY 10546.

Address editorial matters pertaining to the *Quarterly* to the Editor. Advertising matters should be addressed to the Advertising Manager, 6915 Hilldale Dr., Pittsburgh, PA 15236. The *Quarterly* is published quarterly by the North American Rock Garden Society, a tax-exempt, non-profit organization incorporated under the laws of the State of New Jersey. Second Class postage is paid in Millwood, New York and additional offices. Postmaster: Send address changes to *Rock Garden Quarterly* (ISSN 1081-0765), PO Box 67, Millwood, NY 10546.