Geum triflorum "Prairie Smoke"

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The Bulletin

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Front Cover Picture—*Geum triflorum*—Allan Stavos, Wayzata, Minn.

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PRAIRIE SMOKE

MARYANN COLLINS
Apple Valley, Minnesota

Prairie Smoke, Grandfather's Beard, China Bells, Old Man's Whiskers, Purple Avens, Long-Plumed Avens, and Pink Plumes are all common names generated by a single extraordinary North American native plant: *Geum triflorum*.

Though the plant is most commonly referred to as Prairie Smoke, its unique character in flower and especially in fruit, coupled with its extensive range, which runs from the Great Lakes west to British Columbia, south through the Midwest and Plains, and down the mountains to New Mexico and California, has produced these many provocative vernacular names.

The plant consists of a basal clump of almost fern-like pinnately compound and toothed leaves arising from a thick rhizome-like root. From April to July, depending upon the elevation, nearly leafless flowering stems arise from the clump of foliage, each usually carrying three flowers as indicated by the species name, *triflorum*. However, two, four, or even five flowers per stem is not uncommon.

The flowers are of curious form, almost defying description. Each blossom consists of reddish sepals, perhaps more accurately described as russet or old rose in color, which are fused at the base to form a cap-shaped structure.

From within this cap of sepals, and nearly hidden by it, protrude five reddish or straw-colored petals and numerous stamens. The flowers are held modestly drooping on crooked stems, producing an effect of hanging ruddy urns. The name China Bells probably refers to the shape and pose of the flowers as well as their unusual substance. Though delicate in appearance, each stem of flowers remains unchanged and in perfect condition for four to five weeks. Those unfamiliar with the plant will wait expectantly, and fruitlessly, for the "buds" to open, and only after considerable time will realize that these half-inch "seeming-buds" are the flowers.

After this long period of bloom the flowers are transformed, as if by metamorphosis, into magnificent seed plumes, the "smoke." The flower stalk, curved downward while in blossom, simultaneously elongates and straightens, while the styles lengthen and become featherlike. The plant thrusts aloft a lavish, silvery-pink cluster of seeds. This plume is composed of a cluster of seeds, more properly called achenes (small, dry, hard fruits that do not split open when ripe), each consisting of a beaked head and a feathery tail up to two inches long. This showy seed-head is the obvious instigator of such names as Grandfather's Beard, Old Man's Whiskers, and Pink Plumes. Observed at a little distance, an area thickly studded with *Geum triflorum* in fruit gives a pinkish, smoky appearance, thus the name Prairie Smoke.

Prairie Smoke in bloom and fruit puts on a continuous performance for two months in spring and often produces a stray flower or two during summer and fall if stimulated by a generous rainfall. Moreover, even when not in bloom or fruit, the basal clump of leaves is attractive and adds substance and stability to the rock garden at all seasons. In spring, when the snow first recedes revealing a mass of dead leaves and brown soggy mats, Prairie Smoke's clump of foliage, already verdant, is a welcome and encouraging sight. Close inspection will reveal tiny buds, furry and tight against the foliage, already formed as early as March. During the entire growing season the plant is not marred by insects, drought, or other foul weather. In late summer and autumn the leaves will often color red or mahogany, again adding color and interest to the garden.

In this description no mention has been made as to plant size, since, as is often the case with a plant that occurs over a wide geographical area, variation exists. In Minnesota where I first became familiar with it, Prairie Smoke is a common plant of tall-grass prairie remnants. Further west on the High Plains it grows in the less arid areas, often interspersed with sagebrush. In the mountains of the west it is a plant of high alpine meadows. Obviously, Prairie Smoke occupies various habitats. Moreover, the plant grows at widely divergent altitudes, ranging from near sea level to well over 8,000 feet.

For this reason, a general statement that the plant may vary in height from six to twenty inches or more and when left undisturbed, that the stout rootstock, increasing much like a clump of iris, will form a horseshoe-shaped mat two feet or more across, is true but misleading, tending to convince a rock gardener that Prairie Smoke is too tall and large for rock gardens. This conclusion is unwarranted.

One form of Prairie Smoke that I grow is that which occurs on the limestone prairies of Minnesota that border the Minnesota River from Jordan to Chaska. Its leaf measures a very consistent nine inches from the leaf tip to the end of the petiole. In bloom the plant measures ten inches, and approaches one foot when in fruit. The spread of the plant is slow but steady, not ram-

pant, and easily reduced by judicious division every three years. This plant grows comfortably for me in a rock garden that measures fifteen by twenty-five feet.

Smaller forms also occur. On July 4, 1978, we came upon a meadow at Rabbit Ears Pass, Colorado, at an elevation of 9600 feet, thickly covered with Prairie Smoke just coming into bloom. The entire plant was considerably compressed. Each leaf, more finely cut and ferny than usual, measured only three and a half inches from leaf tip to end of petiole. In bloom the plant barely reached six inches. This form has retained its miniature stature under cultivation, creating an altogether charming clump of much-dissected foliage.

Other forms are also available. One nurseryman, George Schenk (The Wild Garden), lists three varieties: *Geum triflorum* 'Bighorn Mountains', ten inches; *Geum triflorum* var. campanulatum, a dwarf pink form of the Olympic Mountains; and *Geum triflorum* 'Davidson Ranch', which reaches a height of fifteen inches.

In cultivation, Prairie Smoke prefers a rich to average garden soil and full sun. Though appreciative of spring moisture, this plant is exceptionally tolerant of drought, and seems equally impervious to hot, drying winds and low humidity. It is extremely cold-hardy, having withstood -30°F in my garden; even colder temperatures probably will not harm this rugged plant. It seems to have no pests, though goldfinches will filch the seed, a liability only if one wants it for other purposes.

Germination of Prairie Smoke seed is not difficult, but the resultant seedlings may require three years to bloom. I had excellent germination of both *Geum triflorum* var. *campanulatum* and var. *ciliatum* received from the ARGS Seed Exchange this spring using my usual technique for alpine seed germination, i.e. placing the pot of planted seed in a cold frame, which I cover only with window screens, exposing the seed to the weather from February or March onward. In July, when each plant had two or three true leaves, I potted them separately in two and a half inch pots. Wintered in a cold frame, these plants should be large enough for the garden next spring and, I hope, will bloom the following year.

Division of the rootstock is another method of propagation. Either early spring or late summer division gives good results. The plants thus divided resent this procedure and sulk mightily, but once the initial shock wears off, reestablishment is rapid and losses infrequent.

Geum triflorum is an unusual and largely unappreciated plant that deserves to be more frequently grown in rock gardens.

Note From a Sandgrower

One of our members, who grows many difficult plants with considerable success in sand "a la Deno" (See Vol. 38, No. 2), sends in this note: "It seems obvious, but it should not be overlooked that the sand should be thoroughly dampened before planting". He also advises that sand beds on even a slight slope or if contoured or mounded need frequent watering.

EASTERN AMERICAN TRILLIUMS

PART II

Frederick W. Case, Jr.
Saginaw, Michigan
Photographs by the author

Part I covered the pedunculate trilliums of eastern North America.

THE SESSILE TRILLIUMS

The sessile trilliums, subgenus *Phyllantherum*, comprise a large and confusing group of American trilliums. Most are less showy of flower than those of the pedunculate group, but all hold interest for the gardener. In this group, the "leaves", really enlarged bracts on the flower scape, possess, in Eastern species, varying degrees of mottling in green tones and underlying bronzes. Even without the flowers, they are worthy of cultivation as accent plants. The flowers differ from those of the pedunculate group in that the petals and sepals stand directly upon the leaf-bracts (i.e. they are sessile). Except in one species, the petals are erect and somewhat connivant, rather than spreading to reveal the reproductive organs within. Petal colors run mostly into maroon or bronzy reds with varying degrees of green and brown intermixed. Yellow and green flowered species occur, and albino, partially albino and pallid color forms abound.

Sessile species occur only within the continental United States and adjacent Canada.

The most recent taxonomic treatment (and in my opinion the most accurate and useful treatment so far) by Dr. John D. Freeman, appeared in *Brittonia*, Vol. 27, no. 1, pp. 1-63, Jan. - March, 1975. Serious students and gardeners must consult Freeman's work to gain insights into the nature of the "species" in this section, for all previous works badly confuse populations and forms.

Some species in this subgenus appear less distinct from one another than do species in subgenus *Trillium*.

Freeman divides the sessile subgenus *Phyllantherum* into three somewhat informal "species groups". These, he says, are groupings of species which he feels show affinities with each other. The groups do not represent taxonomic sections in the usual sense.

The Eastern Sessile Trilliums

Group I
The *Trillium recurvatum* group.
- *T. recurvatum*
- *T. lancifolium*

Group II
The *Trillium sessile* group.
- *T. sessile*
- *T. decumbens*
- *T. underwoodii*
- *T. decipiens*
- *T. reliquum*
- *T. discolor*
- *T. stamineum*

Group III
The *Trillium maculatum* group.

T. maculatum
T. foetidissimum
T. cuneatum
T. luteum
T. ludovicianum
T. gracile
T. viride
T. viridescens

Group I.

Trillium recurvatum Beck

The aspect of this species is tall and lanky, but the plant varies considerably depending upon its vigor, the local race, and the type of soil on which it grows. The species ranges from northern Alabama to extreme southwestern Michigan, and from Ohio and Kentucky west into Iowa, Illinois, Missouri, and to northern Louisiana. It can be locally abundant or very rare in various parts of its range. Its common names include Prairie Trillium, Toad Trillium, and perhaps most imaginative of all, "Bloody Noses", a folk name in parts of Missouri.

Structurally one of the most distinctive of the sessile trillium species, *T. recurvatum* plants are tall, with strongly petiolate leaves up to six inches long, heavily to rather obscurely mottled. The sepals recurve to become adpressed to the scape below the leaves, a feature found (to a lesser degree) in only one other sessile trillium. The petals, usually rather ovate-lanceolate are acute at the tips, condensed into an almost stalk-like claw at the base and are about one to one and one-half inches long. Their color is a dark maroon red to purple, fading to a brownish red with age and varying in color forms to greenish brown, maroon or even pure yellow.

The very clear colors make particularly desirable subjects for garden use.

Trillium recurvatum

The rhizomes of this plant are rather narrow, elongated, and brittle and must be handled with care. The plant is completely winter hardy.

In most of its habitats it grows in a heavy clayey or limey soil. Riverbank or low woodlands constitute favored situations northward.

In my garden, the plant is prone to form small offsets which, in my sandy soil, are slow to mature.

The open growth habit and darkly mottled leaves make this an interesting, if not terribly showy plant. It is common enough over most parts of its range that reasonable collections for horticulture ought not in any way to injure wild populations. Wildflower dealers from Indiana westward to the Great Plains may occasionally offer this species to the trade.

Trillium lancifolium Raf.

Trillium lancifolium appears to be poorly known, but its narrow segments, its almost wire-thin petals, and its rather delicate proportions make the plant a most desirable contrast plant in the wild garden.

The Lance-leaved Trillium ranges from eight to eighteen inches tall, with somewhat drooping, sessile, narrowly lanceolate-elliptic mottled leaves. With narrowly linear, crepe-paper textured, crinkled, purplish-green petals one to two inches long, the plant is one of the most distinctive of all sessile trilliums. The entire aspect of the plant, scape, leaves, and petals, is one of narrowness.

Found from South Carolina to Alabama, especially in areas adjacent to the Cumberland Plateau in Alabama and Georgia, it seems not to have a generally distributed population, occurring instead in local areas with wide gaps between colonies. Besides the localities bordering the Piedmont, it occurs in the vicinity of Lookout Mountain, Tennessee, and much farther south in Georgia and Florida in areas bordering the Chattahoochee River.

The colonies I have seen grew on clayey floodplains and adjacent streambank soils in mature woods which, in that area, are somewhat brushy and rank. The plant is both local and unobtrusive where it occurs. Until one is experienced, locating the plant in the wild is not easy.

The narrow, linear white rhizomes grow just below the surface of the heavy soil, and break easily. Digging the plant, therefore, is difficult, but pieces of broken rhizome soon produce small plants.

The generally delicate aspects of this species seems to imply that the plant might lack hardiness. This seems not to be so, for it has survived seven winters, some of them very open and bitter, in central Michigan.

T. lancifolium seems to be unknown to most gardeners, at least in the North. This is a pity, for it is quite unlike any other species. I prize it highly, and am trying to find a ready means to propagate my plants for distribution.

Trillium lancifolium

Group II

Trillium sessile L.

Trillium sessile, the Toad Trillium, enjoys a wide range, from western Virginia westward about to the Indiana-Illinois state lines. It is largely absent from Illinois, but abundant again in Missouri and northern Arkansas. Northward it reaches to southwestern Michigan where it is very rare, all of Ohio, and eastward into southwestern Pennsylvania and barely into southern New York. Southward, it ranges into central Kentucky and Tennessee, with a few outlying stations in Alabama and North Carolina. It grows in a great variety of woods, thickets, and even in fencerows and hog pastures. It prefers a rich, fairly heavy, limestone soil.

Horticulturally, a much misunderstood species, most plants illustrated in magazines as *T. sessile* do not represent this species, but rather either *T. cuneatum* or one of the western species

formerly lumped by horticultural writers into "*T. sessile californicum*".

True *T. sessile*, is a plant of low stature, rarely more than ten inches tall, with relatively broad, obscurely mottled, broadly sessile leaves. The sepals spread but do not reflex. The inch long petals, widest at the middle, and tapering without a claw to their base, range in color from rich maroon-purple to dingy liver brown or greenish yellow.

One of the most tolerant of trilliums, its chief value horticulturally lies in its great adaptability to most climates and soils, and to its early blooming period. It deserves a place in the garden even though it is not as showy as some. Plants offered as *T. sessile* by many dealers may prove to be other species.

In Kentucky, west of Louisville, *T. sessile* intergrades at times with *T. recurvatum*. Intergrades possess narrower leaves than *T. sessile*, with varying degrees of the petiolate condition. Their petals, too, vary between the conditions found in both species.

Trillium sessile

Trillium decumbens Harbison

If I had to choose but one sessile trillium for the rock garden, it would be this species. It is almost unbelieveable in growth habit. Truly decumbent, its great, strikingly mottled leaves spread flat upon the forest litter and rocks among which it grows. The first time we found it in the wild, we were amazed; we could not escape the impression that the plants resembled ancient oil lamps with the four-inch petals the red, glowing lamp fires. The fact that this species often grows in large patches accentuates its striking manner of growth.

T. decumbens arises from a stout, deeply buried rhizome. The five to eight inch scape literally bends and lies along the ground. The sessile leaf cluster, up to eight or ten inches in diameter on robust plants, bears at its center relatively short green sepals, but very erect, slightly twisted, lanceolate three to four inch dark red-maroon petals. When sunlight strikes these large petals the "ancient lamp" effect is stunning.

This species appears very early in the season, but blooms from mid to late season. Long before the buds open, the highly colored, mottled leaves draw attention in the garden. As fruits develop following flowering, the stem elongates somewhat, but remains decumbent. The leaves are short-lived, and soon dry up or rot away leaving the scape and fruit to mature over the summer.

A natural rock plant, we find the Decumbent Trillium in sloping rocky woods, talus below shaley ledges, and at the bases of massively weathered tufa-like limestone boulders. Typically, the plant forms colonies of hundreds of plants neatly spaced so that the leaf tips just touch. We have seen the plant growing in very mature woods where dense shade develops early, and in open, second-growth woods of oak and

Trillium decumbens

maple, where sufficient light prevails to allow some grasses to grow.

T. decumbens occurs in a narrow band from northwestern Georgia, to Tuscaloosa, Alabama, mainly in foothills of the Cumberland Plateau and the Ridge and Valley Provinces. *T. decumbens* is not present in every available habitat within its range as some species of trillium are: rather large colonies occur somewhat sporadically.

Rock gardeners ought to make every effort to get this species into cultivation, for it is truly an outstanding plant. Although it can be locally abundant, (Freeman, 1975), its range is limited. Alabama conservationists have expressed special concern (Freeman, et al. 1979) that it might be collected excessively. It should be propagated by nurseries or botanical gardens and offered to the trade, not heavily collected from the wild. It is not, to my knowledge, offered commercially at present.

Planted in a well drained, slightly acid loam, this species has not only wintered well for me, but has seeded in my garden. Its manner of snuggling up to the contours of the garden ledges or against a rock is unlike that of any other species. Those who have seen it, desire it.

Trillium underwoodii Small

I have found Underwood's Trillium in the wild only once; my experience with it is therefore limited.

A trillium of medium stature, it stands from five to 10 inches tall with sessile, lanceolate leaves. The leaves bear conspicuous mottlings in shades of light and darker greens. According to Freeman (1975), the mottling varies from colony to colony. The sepals, lanceolate to ovate, and one to two inches long diverge or spread. The oblanceolate to narrowly elliptic petals are one and one half to three inches long. Color as in nearly all the sessile species varies from dark purple or maroon to brownish purple, or greenish yellow. This variation is

influenced both by the genetics of the individual plant and the age of the flower; most sessile species losing the rich reddish maroon tones with age and developing a liver-brown, less attractive color.

In *T. underwoodii*, the stamens bear very short filaments and lateral pollen sacs on a connective which extends a millimeter or two beyond the pollen sacs. Stigmas are very short and recurved upon the ovary.

Although this species is very closely related to and like *T. decipiens* in many aspects, Freeman (1975) asserts that they can usually be distinguished in the field readily. *T. underwoodii*, apparently, does not grow in mixed populations with its closest kin. Its short, erect scape permits the drooping leaves (at flowering) to touch the substrate (not so in the taller *T. decipiens*).

Within its range *T. underwoodii* blooms from mid-February to April. It occurs from Mobile, Alabama, across north Florida to western Georgia, extending northward onto the Piedmont, especially in Alabama.

We found Underwood's trillium growing along the base of ravine slopes near a small stream, in a very rich beech and oak woods. Soil was slightly sandy and rich in humus. Plant companions at this station were acid-soil species.

Plants we observed in John Lambert's arboretum collection at Mena, Arkansas, were particularly rich in both leaf and flower coloring.

Trillium decipiens Freeman

The epithet *'decipiens'* means "deceiving", and refers to the similarity between this species and *T. underwoodii*. A much taller plant, with stiffly spreading leaves, the scapes attain heights of up to one foot. The broadly lanceolate petals range from greenish brown to maroon, the maroon tones fading to liver brown with age. The strongly mottled, lanceolate leaves often with a light band of pale green along the midrib and almost maroon tones below the greens would render the plant striking in the garden if it never bloomed. At blooming time, the flowers are large in proportion to the leaves, making them appear quite conspicuous for this type of trillium.

We have seen this trillium growing in a very robust form in acid woodlands in Alabama, and on limestone soils in woods and along stream banks near Marianna, Florida. It grows in much the same situations as do both the sessile and prairie trilliums farther north, preferring the lower slopes of wooded bluffs along streams.

A few of the Florida plants have survived one severe, open winter here at Saginaw. This past spring we collected a few rhizomes from plants farther inland in Alabama which may prove to be even more hardy. Our experience with widely ranging Coastal Plain and Piedmont plants found from the Mobile Bay area eastward into the Carolinas has been that populations from Alabama tended

Trillium decipiens

to be more winter-hardy than those from farther east.

One disturbing note on collecting this plant: in Florida, we found a whitish fungus destroying the leaves and fruits of a great many plants of some populations. Persons collecting this species from the wild ought to take great care not to introduce disease to their gardens or to introduce this disease to new areas where it might spread to other species.

Trillium reliquum Freeman

This very rare and limited trillium has a peculiar distribution. It grows along the Savannah River near Augusta, Georgia, and in adjacent South Carolina, and also disjunctly in southwestern Georgia near the Chattahootchee River. In both localities it grows in mature hardwoods with oaks and beeches, on bluff summits and slopes to the flood plain.

This species, like *T. decumbens*, has scapes which can be semidecumbent, although, in my experience, not so strikingly so as the description of the species by Freeman implies. The scapes, with a slight S-shaped bend stand not over eight to 10 inches tall. The sessile, bluntly tipped leaves show beautiful mottlings of light and dark greens underlain with some maroon tones. The flowers are somewhat nondescript, with lanceolate-ovate, maroon purple petals about one to one and a half inches long. Yellow petaled forms occur.

T. reliquum blooms from mid-March to late April in the wild. In my mid-Michigan garden, it blooms in mid-late May, being one of the later trilliums here. Although it is winter hardy (Augusta, Ga. plants) it does not grow well nor flower well for me. A deep forest species, its leaves are extremely sensitive to windburn. It is not, therefore, particularly desirable horticulturally.

As the rarest of the sessile trilliums in the East, it deserves designation as an endangered or threatened species and should be left in the wild.

Trillium discolor

Trillium discolor Wray ex Hooker

After *T. decumbens*, this species would be my choice as the best sessile trillium for the rock garden. It is a small plant, with leaves held close to the ground, rarely growing six inches tall in cultivation, but growing occasionally to eight or ten inches tall in the wild.

The sessile leaves, richly blotched in dark green over a softly mottled background, and broadly ovate-elliptic, appear very early in spring. In its native haunts, the plant blooms early, but in my northern latitude the leaves and buds appear, followed by a period of several weeks of waiting. Finally, when most of the other trilliums begin to fade, the delightful lime to lemon colored flowers appear. The short, wide, tapered petals show greenish veins and are distinctly apiculate. The flowers last long but slowly fade to a light straw color. Fresh blooms are spicy-fragrant.

This trillium is restricted almost entire-

ly to the upper tributaries of the Savannah River system in the Piedmont of Georgia and South Carolina and the Blue Ridge Mountains valleys of North Carolina. Although it grows in a variety of woods, it prefers small flats along mountain streams where thickets of *Leucothoe, Kalmia* and *Rhododendron* occur. In such localities, the most vigorous plants grow in bright, open areas under tall trees.

The small size, late blooming, distinctive lemon coloring, full hardiness, and attractive leaves all season make this a truly outstanding plant for the rock garden. It is, however, a very local species. If it is not yet designated for protection under the endangered species act, it probably will be, for a large part of its originally limited range has been destroyed through the building of power dams and impoundments. Efforts by some botanical gardens or qualified horticultural societies to obtain and propagate the plant for release commercially would undoubtedly take pressure off the remaining wild populations, and should be undertaken.

I have grown this plant in Michigan for almost twenty years; it is beginning to seed around the parent colony. I will attempt to make seed available through the ARGS seed exchange.

***Trillium stamineum* Harbison**

A large and distinctive species, *T. stamineum* is practically unknown to gardeners outside its range. It is the only trillium with spreading, corkscrew twisted petals borne directly atop the obscurely mottled leaves. The aspect of this plant is like no other trillium.

Scapes stand twelve to twenty inches tall, with the leaves variably lanceolate to ovate-elliptic, usually fairly broad for their length and weakly mottled to plain green. The petals are short, one to one and a half inches long, twisted, and dark maroon in most forms, although I have a form with pale yellow petals overlain with pink. Clear yellow forms have been reported. In this species, as in *T. discolor*, the petals are apiculate. The stamens are massive, erect, clustered into a conspicuous ring, almost more apparent than the petals to a visiting insect.

Trillium stamineum

T. stamineum is too tall for the usual rockery, never-the-less one should grow it for its distinctive flower. A place at the back of the rock garden or in a woodland setting would be best.

This species grows natively in a north-south band from northern Alabama and Mississippi into Tennessee. Within this area it is locally abundant in rich woods, on ledges, and on slopes above and descending onto flood plains. We have found it growing with *T. recurvatum* but have seen no evidence that they hybridize.

T. stamineum is completely winter hardy with me in central Michigan. It is illustrated in color in the Time-Life book on Wildflower Gardening (Crockett, et al., 1977).

Group III.

***Trillium maculatum*, Raf.**

This large and quite showy trillium

ranges across the middle and outer Piedmont and Coastal Plain of South Carolina, Georgia, and Alabama, and locally south into the panhandle of Florida.

Plants range in height from a foot to almost two feet tall, with sessile, elliptic to broadly elliptic leaves. The leaves may be obscurely to strongly mottled. In the best forms we have seen (near Augusta, Ga.) the leaf markings were especially prominent, with light, medium and dark bronzy green blotches, some underlain with a deep maroon red. The petals, distinctly spatulate, broadest beyond the middle and stiffly divergent-erect, are rich maroon-red to a dark garnet red. The color does not fade to the dull liver tones of so many of the sessile trilliums. The Spotted Trillium, therefore, is a colorful and particularly desirable garden plant.

T. maculatum blooms very early in the season, both in the wild and in the garden. It grows in a variety of rich woodlands of both upland and floodplain. We have seen it on acidic and limestone soils.

As in most of the sessile trilliums, bicolored yellow and purple petaled and pure yellow petaled forms occur, but we have not seen them.

This trillium has been much confused by botanists with other Coastal Plain and Piedmont species. Much of the literature prior to Freeman's treatment (1975) may refer to other entities so one cannot rely upon stated characteristics or distributions in the older works.

Despite its deep South distribution, plants from near Augusta, Ga. have proved completely hardy here for many years. Recently we obtained a few plants from west Florida. These were relatively taller, with smaller leaves and flowers than those from Augusta. It remains to be seen how they prosper.

In leaf and flower color, this is almost more desirable as a garden plant than the larger and more vigorous *T. cuneatum* which is of similar aspect. *T. maculatum* is not, to my knowledge, offered in the trade.

Trillium foetidissimum

Trillium foetidissimum Freeman

The Fetid Trillium quite strongly suggests *T. sessile* in its general size and habit. Its leaves, however, are far more strongly mottled, and are carried at a slightly different angle. One gets the impression, in the field, that the leaves are carried at a precise right angle to the stem and droop less at the tips than do those of *T. sessile*.

While the ranges of *T. foetidissimum* and *T. sessile* do not overlap, specimens of either from horticultural sources could easily be mistaken for the other species.

In *T. foetidissimum*, the leaves are more conspicuously mottled with more varied tones, the ovary is not distinctly six-winged, the stigmas are usually not as long as the ovary (at flowering). The scent of the flowers in *T. sessile* is spicily unpleasant, while those of *T. foetidissimum* have, according to Freeman, a "strong, nearly stifling, carrion odor."

T. sessile occurs in the midland states

mostly north of Tennessee and Arkansas. *T. foetidissimum* occurs east of the Mississippi River in southern Mississippi and that portion of Louisiana which lies east of the Mississippi River.

We found this species growing in low woods along a small river in rather trashy thickets, and also in more attractive cover on lower ravine slopes near the headwaters of small rills. It grew on open forest floors in leaf mold, and occasionally on low rocky outcroppings. Plants were mostly scattered, with little tendency to form clumps.

Freeman (1975) says that *T. foetidissimum* inhabits floodplains, river bluff forests and ravine slopes under beech, magnolia, and pine.

This is an attractive plant, particularly in leaf. If it proves to be sufficiently winter hardy for northern gardens, it will be very useful in the rockery. If it proves not to be hardy, it is sufficiently like *T. sessile* so as not to be badly missed.

Trillium cuneatum Raf.

Trillium cuneatum, also widely known as *T. hugeri*, is one of the plants frequently illustrated as "*T. sessile*", especially in European articles. A large trillium, it is worthy of a featured spot in the wildflower garden.

Plants stand one to two feet tall and bear large, chordate-ovate acuminate leaves which possess strong mottlings in light and dark green with some maroon undertones. These leaf markings fade and blurr somewhat during the season, but the plant remains a good accent plant until it dies down at season's end. In the best garden forms, two to three inch, cuneate (wedge-shaped), heavy textured, inch wide maroon-purple to bronzy purple petals stand upon the leaves. Petal bases are not narrowed or thickened into a claw in this species. The narrower sepals may be green or with strong maroon purple coloring on their upper surfaces.

Trillium cuneatum

An early emerger and bloomer, *T. cuneatum* remains in bloom for weeks. When fresh, the flowers have a faint, pleasant scent. Older blooms lack odor and fade to the usual liver-brown undertones, which, to my mind, detract somewhat from the plant's beauty.

Last spring, we found plants in Tennessee which developed undertones of orange as the flowers aged. Some of these plants now grow in my garden where we will observe them. If they still show promise, we will attempt to self-pollinate them and work toward the possibility of producing orange trilliums.

Trillium cuneatum grown natively on Ordovician limestone soils in Southern Kentucky, Tennessee, western North and South Carolina, Georgia, Alabama and northern Mississippi, occurring farther south into the Piedmont and Coastal Plain as one moves toward the Mississippi River. It occurs in a variety of woods and thickets, from very mature beech and oak forests to dry scrubby oak wood. Plants from Georgia and Alabama which we have observed have smaller, narrower petals of darker purple-maroon than those from Tennessee and Kentucky. The largest plants we have ever seen grew near Huntsville, Alabama in a mature beech woods. They stood fully two feet tall, with immense leaves and four inch petals.

Trillium luteum

As with most of the maroon purple sessile flowered species color forms occur with brown, liver, greenish yellow, lemon yellow petals, or bicolors with dark bases and green or yellow extremities. We grow a beautiful, clear light green form from the hills of northern Georgia. It is not a very large form, but it is very attractive.

Despite its being rather closely associated with specific limestone soils in the wild, the plant is extremely easy to cultivate in almost any garden soil. Even in my very unsuitable sandy acid soil seedlings appear regularly.

Appalachian wildflower nurseries offer the plant (often listed as *T. sessile*) and it is well worth growing.

Trillium luteum (Muhl.) Harbison

Except for flower color and petal shape, the general description for *T. cuneatum* might serve also for *T. luteum*. In *T. luteum*, the somewhat narrower, lanceolate petals range in color from pale lemon yellow to a strong clear darker yellow in wild plants. However, some of these darker yellow forms, transplanted to my garden, consistently yield paler, greener tones at this latitude.

Flowers of *T. luteum* emit a pleasant lemon scent, those of *T. cuneatum* a spicy, musky or faintly fetid odor.

T. luteum, an excellent garden plant, occurs naturally in western North Carolina, and then, more abundantly in eastern Tennessee, where it is the only sessile trillium in Great Smoky Mountain National Park (Freeman, 1975) and thence northward and westward it occurs into south-central Kentucky. In the vicinity of Gatlinburg, Tenn. the blooming plants literally light up the forests and roadsides with a soft yellow glow.

It prefers to grow in rich, moist, rocky woods and lower hillsides, often on

lower slopes above a small streambed. Unlike some sessile species, however, it is not confined to river drainage situations.

In southern Kentucky *T. luteum* and *T. cuneatum* occur in the same woodlots, a situation seldom seen elsewhere. In such stations obvious hybrids and intergrades abound.

Authors prior to Freeman frequently lumped *T. luteum* with *T. viride* Beck, or with various pallid color forms of other species. Consequently, the confusion in the literature about its range and characteristics is considerable. Freeman's treatment (1975), seems to me best to reflect the situation which exists in nature.

Trillium ludovicianum Harbison

Louisiana Trillium stands about six to twelve inches tall. The bracts or leaves are sessile, lanceolate to broadly ovate, and from three to five inches long. The leaves are mottled distinctly, but not so strongly as in *T. decipiens* or *T. underwoodii*. Petals are linear-oblanceolate, one and one-quarter to two and one-quarter inches long, somewhat divergently erect. In color they are green, merging into purplish at their bases. In this species the lower portion of the petal is narrowed and somewhat thickened into a claw-like base. Flowers have a distinctly bicolored appearance. The ovary is six-angled.

This species, according to Freeman (1975), is somewhat intermediate between the species found in Missouri, Arkansas and the Texas-Louisiana border country, and the sessile species found farther east.

We have not seen this species in flower yet, but we have seen the plant and collected it in the wild in central Louisiana. Because our time was very limited, we were able to visit only one small station. Here, under beeches, magnolias, and a scattering of pines, on small ravine bluffs along a stream, Louisiana Trillium grew in heavy leaf mold at the bases of trees and about old rotten logs. In this woods, which had been recently pastured, plants were not common. Freeman, (1975) however, avers that the plant is locally abundant in central Louisiana. He gives its range as "Upper Coastal Plain of Louisiana (west of Mississippi River) and eastward into Mississippi". It is very local in Mississippi and is said to intergrade there with *T. cuneatum*.

Since we have just obtained this species this past summer (1980) we cannot yet comment on whether or not it will prove hardy.

Except for the avid collector, this species, like several others from the Gulf Coast region, is not essential to gardeners, for its horticultural differences from other, thoroughly hardy and readily obtainable species is minimal.

Trillium gracile Freeman

Trillium gracile is another sessile species with which I am only slightly acquainted. We found it growing abundantly on floodplain alluvium of tributary streams to the Sabine River system in extreme western Louisiana. The plants we found had been completely inundated, and while covered with dry mud, were in full bloom.

Stems (scapes) of this species stand eight to twelve or more inches tall. The sessile, elliptic or elliptic-ovate leaves (bracts) are only two and one-half to three and one-half inches long, the apices of those we saw bluntly rounded. Color was a dull bluish green with some darker spotting, but lacking the dramatic coloration of some of the more southern sessile trilliums found farther to the east.

The petals are linear-elliptic, fairly short, one to one and one-half inches long, their tips acute or rounded. Freeman gives the color as either dark purple or yellow. Those we saw were ex-

clusively dark purple. Because of the flooding, the plants we observed at first hand were deteriorating; we observed no characteristic odor. Freeman likens the odor of Graceful Trillium to that of the Morel mushroom (*Morchella*).

T. gracile grows in open to dense pine and hardwood forests on slopes, streambanks and alluvium. While Freeman says that the soils where it grows are usually sandy, where we collected our plants the soil was distinctly clayey.

T. gracile ranges from extreme southeastern Texas eastward into Louisiana where it occurs primarily on the upper Coastal Plain of counties bordering on the east Texas boundary.

We have yet to see how this species winters in central Michigan. Like *T. ludovicianum* and *foetidissimum*, if it fails to survive here, it is not sufficiently distinctive horticulturally to be deeply mourned. If it is hardy, then from the collector's viewpoint — hurrah!

Trillium viride Beck

In northeastern Missouri and southern Illinois, in counties close to the Mississippi River grows a trillium which until recently, was much confused with *T. luteum*. This plant, *T. viride*, the Green Trillium, seems to be quite distinct.

A moderate plant, *T. viride*, stands ten to eighteen inches tall, with elliptic leaves either dark green or only very faintly mottled. Leaves are somewhat blunt tipped and exhibit numerous stomata on their upper surface (Freeman, 1975, page 44), a feature generally not found in other sessile species. The petals are narrow, spatulate to linear, up to two inches long, and somewhat clawed (narrowed basally). Petal color is frequently dark purple at the base, becoming green to yellowish green distally. All purple and all green forms occur. In my plants there is a tendency for the petals to be divergent spreading and somewhat twisted.

T. viride grows in rich woodlands, rocky, but damp hillsides, and slopes above river flats within its range, often on limestone soils. We were surprised to find it at its best in very thin open sites, often quite brushy and grassy, with a minimum of tree cover overhead.

Plants from Missouri have proved difficult to grow and even more difficult to flower here. This may be because of the sandy, dry, acidic nature of my soils, but in any case it is unfortunate, for the dark leaves and green flowers make this a desirable garden plant.

Trillium viridescens Nutt.

This Ouachita-Ozarkian Mountain species bears a close relationship and physical similarity to *T. viride*. It grows somewhat taller, to over eighteen inches, with broader leaves which end in acuminate tips. Mottling of the leaves may be absent or obscure. Leaves tend to be carried at right angles to the scape. The narrowly linear-spatulate petals stand erect with a gently graceful single twist. Petal color is a clear green above a dark maroon base. (see color photograph, Crockett, et al., 1977). As with the other sessile species, yellowish, green, and all purple forms occur.

T. viridescens occurs in southwestern Missouri, all of western and northwestern Arkansas, and eastern Oklahoma, with a few stations known from extreme southeastern Kansas and northeastern Texas. Its habitat is rich soil on slopes, bluffs, talus and river alluvium under mature trees. Magnificent native colonies grow in John Lambert's Mountain Fork River Arboretum near Mena, Arkansas, often in surprisingly heavy floodplain soils among canebrake.

A handsome species, well worthy of cultivation, *T. viridescens*, like *T. viride* has proved difficult for me. It is prone to a leaf dieback here, so early in the season as to interfere with food manufacture. Consequently plants linger but do

not store sufficient food to flower well. Perhaps my sandy, acid soil is the problem.

From the standpoint of interest and the collector, there is no such thing as a "bad" trillium species. All evoke uncommon interest, many present a real challenge to those who search for them, some possess great grace and beauty. Surely they are among the loveliest of American wildflowers and a noble contribution to the world's forests and gardens.

A PERSONAL POINT OF VIEW

In this day of high interest in and concern for endangered species, I am sure that some readers will feel that one ought not to discuss or to encourage the growing of any "rare" species. True, some trilliums are rare and local, but within their ranges, all but about two or three species are really quite common. Wise collection, coupled with propagation and nursery availability is quite feasible, and should, in my opinion, be undertaken. It will not endanger any species if approached properly.

I sit on the Technical Advisory Committee on Endangered Plants for the Michigan Department of Natural Resources. It is our function to review, recommend, and establish the rarity status of our native Michigan plants. I also speak before many types of garden clubs and conservation organizations. I have heard all kinds of statements and arguments relating to the conservation of our native plants. Many are irrationally overzealous and some, such as the frequently heard statement that picking trilliums kills the plant, are simply untrue.

Endangered species laws seek to protect rare wild plant populations, or prohibit commercial exploitation of wild plants. The purpose of such laws is not to totally prohibit the growing of these species or the sale of horticulturally propagated stock.

Trillium viridescens

I believe that a most worthy function of plant societies, arboreta, and botanical gardens is to obtain, propagate, and disseminate stock of even rare or endangered species to gardeners and nurserymen. Such organizations, working carefully with conservation departments, can monitor and grow with continuity from generation to generation many horticulturally desirable rare plants. By introducing selected horticultural forms these institutions and organizations can help to satisfy the demands of collectors and gardeners, thus taking pressure off wild populations through illicit collecting and black market trading, which, unfortunately, will exist so long as no other source of plants is available to the inveterate collector.

From seed*, or from rhizome divisions and offsets, trillium propagation is quite easily accomplished. In my opinion, wise and carefully monitored collection and dissemination should be undertaken. It can be done without en-

dangering any species, and it can add new dimensions to our gardens.

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*Both trillium seeds and rhizomes have built-in dormancy factors which must be considered in propagation. Trillium seeds have a double dormancy, a first period of low temperatures and freezing stimulates the emergence of the root from the seed. A further period of shoot or stem dormancy is necessary, which usually in nature involves a second winter before the shoot dormancy is broken. Trillium seeds, therefore, usually take *at least* two years to appear above ground. Maturation from that point requires from three to seven years depending upon species, soil fertility, and other cultural factors.

Trillium rhizomes also have a bud dormancy. New growth is not initiated until the buds have been cooled sufficiently following a given period of growth. Also, if the top of the plant is removed, the plant will make no further growth above ground that season. It will, however, appear again the following season after the required low temperatures break the bud dormancy.

Unless one is prepared to care for seeds in a frame or pot for several years, I believe it is more practical for gardeners to sow the seeds in a suitable spot in the wild garden and let development take its own course.

Trillium rhizomes may be scarified or partially girdled to produce a ring of buds which will ultimately develop into offset rhizomes. Once formed on the girdled rhizome, however, these offset buds must first undergo the required dormancy-breaking temperatures before any growth appears above ground.

Propagation is not difficult, but it does take time. Someone with the proper facilities ought to undertake a program of tissue culture and experimental dormancy-breaking to speed the propagation process.

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THE SEED COLLECTING CHASE

MARVIN BLACK
Seattle, Washington

Ripening *Lewisia tweedyi* seeds smell like honey: bet you didn't know that. I found out when I entered my dining room (translate: "seed room") one warm July afternoon. This may explain why this plant in the wild can send seedlings uphill several feet a year if ants answer the siren call. To collect seed regularly in the wild is to pick up many such clues and insights.

One starts collecting wild seed with a choice of motives. Greed is one — a cheap way to begin an alpine collection. Forget greed: it's no more valid than the fisherman's delusion that his hobby provides inexpensive food. *Honor* — perhaps. Something grows in the gardener's breast after years of raiding seed exchanges for treasures sent by Icelandic grandmothers crawling across glaciers; Tasmanian children directed onto precipices, too insecure for their parents' weight, to grasp seeds of near extinct plants; or English gentlemen who swim the neighboring castle's moat at midnight to seize the forbidden daisy protected in yon garden. One finally must contribute one's own native rarities and tales of jeopardy to life and limbs.

Near-kin to *honor* is *fame*. What a magnificent epitaph! "Miss Brinkman is of course remembered for the seed pods of *Penstemon wretchedii* clutched in her hand when her body was found at the bottom of Arizona's Precipitous Gorge. Lord Johnstone's plants raised from the 1954 ARGS Seed Exchange seed, placed posthumously in Miss Brinkman's name, yielded the superb orange form that received the Award of Merit in 1959." *Fame* lurks just beyond the seed collector's next ridge.

Having selected a motive, the seed collector turns to strategy. Why trek 500 miles to an unknown area to find only snow banks and buds, or dry tops and shattered seed pods? One must see the plants in bloom, both to know the choicest seed patches and to get acquainted with the plant so as to recognize it elsewhere in seed. Guide books and general botanies give information to help establish what month in a "normal" year the plants bloom and "sort-of" where. But, there are a lot of days in August and a lot of miles in "canyons of the Salmon River." A trip to an herbarium will often give the desired plant on an herbarium sheet, with date the blooming plant was collected and quite often quite specific directions to the "station" where the collection was made. Of course, if you have friends already familiar with the area, cultivate them, even to the point of asking them to lead. With wide-ranging plants, you can then move to lower or higher elevations and probably find any growth stage from bud to seed, but with the rarer things you'll almost certainly have to return two weeks (*Lewisia* and desert plants), four weeks (*Penstemon* and many mountain flowers) or even six to eight weeks later (some moisture-loving things) to find seed ready. This is the two-visit necessity that makes plant and seed collecting expeditions span several months and skyrockets costs. Collectors will often travel to a place one year to see flowers, take pictures and find a few seeds, then return for seed collecting a year-and-a-month later. It also explains

why most serious seed collectors get to know their near-to-home areas well by repeated visits. I know that I can collect *Lewisia tweedyi* seeds somewhere on Entiat Ridge in mid-June, for I find it nicely blooming in early June, and I've learned the few spots it nearly always is flowering May 10 and the high, shaded places where the last blooms will still be out in mid-July. Faith Mackeness knows the seed-pastures of the Columbia River Gorge in the dark from years of experience. Carl and Edith Englishes, Ed Lohbrunners, Roy Davidsons, A.C.U. Berrys, Marcel LePiniecs, Boyd Klines, Margaret and Brian Mulligans and others learned to go cross-country, follow deer trails, and find out where the best populations grew, over decades of tramping the hills.

Wayne Roderick taught me: collect seeds in paper bags — brown lunch bags, bags from the market. The bags are cheap, pack away easily and you can write on them with a lead pencil in the rain. You can hold five in your hand when you are watching for several kinds of seed at once across a hillside. Most importantly, they don't trap moisture and "sweat" as plastic does. Seedheads, often with green stems and leaves attached, will rot or mold in plastic and raise havoc with shattering seeds. You can put entire stems of drying inflorescences, such as those of erythroniums, in the generous bags, and when you get home, you can open the tops of the bags, place them in a warm room on a table, or (my mother's method) run clotheslines on the back porch and clip the bags, tops open, onto the line near the ceiling, warm and out of the way. For violas, lupins, and others with exploding pods, close the top. Our back porch always sounded like a combat zone: Mom was into lupins.

With practice one learns which seeds can be collected before they might seem "ready." When my sister, Naoma Neyerlin, visited from Oregon and first saw *Lewisia tweedyi* in the Wenatchees, I chided her for insisting on carrying home a half-dozen flower sprays in a bottle (on the bus!). Ten days later I phoned her, smirking, "Well, how did your bouquet do?" "Fine; they're shattering seeds all over my window sill." I looked on my own window sill and so were mine. Subsequently, I've tried selecting flowers here and there of special forms to bring home if the plant has no seed pods. Usually the seed comes on and shatters out. Four weeks after finding populations of *Lewisia rediviva* in bud stage, I've returned to find every trace of the plants' blooms, pods and seed gone for the year, as if the acres of plants actually vanished from the earth. Lewisias are fast. Most alliums still have color in the flower when the seed is ripe. Fading flower stalks of heucheras usually ripen, and it took me several years to learn that *Asarum caudatum*, which I never could find in seed, has its seeds ripening in the fleshy backs of the flowers, which scarcely change appearance until one day they just rot down into the moist soil carrying the seeds with them. One learns that certain seeds don't "dry" in the classic sense, and this includes several swamp or moisture lovers.

It takes steady nerves to collect *Corydalis scouleri, C. caseana cusickii* and their kinfolk. These plants proudly bear stalked green pods ready for anything coming by to grab. Ah, there's the rub! That's what these clever plants are waiting for. Let a human or a deer reach to touch a pod — it explodes violently, flinging seeds twenty feet in all directions, sometimes into your eyes. You must tiptoe up to this plant carefully, cup your hands into as large an open ball as you can manage, close your eyes and — Gotcha! And the crazy pods will writhe and pop between your hands like

so many small snakes, while neighboring uncaught pods trumpet the alarm, exploding seeds into the woods like peppershot. This is not a plant for the faint of heart. Dan Douglas and I drove a hundred miles extra last summer to get *C.c. cusickii* in seed, so captured were we by its flower and its bold four-foot stature. We arrived only to find all its cages unlocked a week earlier and a mile of plants yielded less than a hundred seeds where there had probably been millions.

Zygadenus elegans and *Stenanthium occidentale* have seeds that look like shrivelled grains of rice, but in planting them you discover that this immature appearing seed is good. Zygadenus is one of the last of the Olympic Mountain plants to ripen seed; I usually cannot collect it until October.

When you get your seeds home, open the bags and dry the seeds. Some non-shattering things I spread onto large shallow platters to dry, such as lewisias, which have fleshy capsules that can hold lots of moisture and mold if they are piled up or closed in. The same is true of the big head composites that don't shatter, such as *Balsamorrhiza* and *Wyethia*. Air must be able to circulate to dry. I'm unwilling to try the low oven heat (below 120°F.) that some people use and the rays of microwave ovens would kill the life in seeds. A warm porch or upstairs room would be good for seed drying; basements would need to be dry and heated or some seeds would mold. I use the dining room table and we eat in the living room for two months.

Once dried the seeds need cleaning. This operation ranges from the sublime to the ridiculous. Dennis Thompson loves allium cleaning — it's sublime. You can put the heads in a paper bag with a small ball and shake everything around for a while. The ball will dislodge most of the papery chaff. Alliums produce so much seed per square foot in nature, that you won't have to follow up and get the slow-release ones. Genera such as *Calochortus*, *Fritillaria*, *Lilium*, *Erythronium* and *Iris* either simply pour out their seeds or release them with minimal coaxing. They're fun. Then there are the ridiculous ones that aren't fun. One of my sons hasn't visited with me since I had him man the needle-nose pliers to help crack out the seed of *Opuntia fragilis*. I suppose most cacti work that way.

The hard, pointed seed capsules of many penstemons can punch painful holes in your fingers when you try to get at the seed inside; Wayne Roderick recommends grinding a layer of capsules between two bricks to release the seeds. Faith Mackeness prefers to use a small mortar and pestle to avoid the brick-dust mixed with the seeds. I agree; it's not difficult to work out the delicate line between cracking open the capsules and turning the seeds to flour. Heucheras can be part-cleaned this way, or as with many seeds, by rubbing the pods briskly between your hands. With some seeds, such as those of the mat-forming phloxes, the cleaning is easy because the capsules are borne singly on the plants, with only two seeds inside each capsule — the tedious job here is collecting the capsules.

Once you have more or less gotten the seed loose from the seed case, the big problem, at least with some species, begins — separating the seeds from the chaff and debris. The first method with most seeds is to assemble a system of sieves, those used for laboratory work (in soil laboratories, for instance.) Nesting together and made of brass, these are lovely to look at and use, but at about $45 per sieve, a set of four or five sizes is costly. Otherwise you raid the kitchen and the housewares stores for colanders and sieves of different sized mesh. Beyond sieving, some seed still

will not separate from the chaff too well; try slowly pouring from one bowl to another while you or a hair dryer (*very gently*) blow an air current through the stream of falling matter to remove the chaff (the ancient art of winnowing.) Finally, I spread out some seeds onto a sheet of white typing paper, forming it into a bent-shaped slide, tilting that down into another bowl while I gently shake the sliding seeds downward and blow upstream across the top of the flow. Most of the heavier, slicker seeds will continue to slide, while the chaff will move back upstream. With tiny seeds such as those of heuchera, where the chaff is equally tiny and light, I find it works well to place the seeds on white paper and methodically (tediously) tilt the paper one way then another, keeping something below to catch the overflow. The seeds are rounder and tend to roll downhill a bit faster than the chaff.

Certain berry-like seeds dry down well and the seeds can be extracted from the pulp when dry; single-seeded berries I leave in the dried pulp. Some pulpy or glutinous seed, such as that of trillium, I'm told come away from the pulp best with washing — I've not tried. *(Putting berries and glutinous seed capsules in a glass of tepid water and leaving them to soak for several days at room temperature to soften and rot, then rinsing and gently rubbing them between your fingers in a sieve under cold running water sometimes works well. — Ed.)* Drying down pulpy seeds takes several weeks unaided, and the seed exchange deadlines come frightfully early for so much delay; our berries are often collected in October.

Until I helped package seeds in the ARGS distribution, I little realized what were proper quantities to send. The average collector sends them in too large quantities — it isn't hard to collect a quarter-cup of certain penstemon seeds, which in the case of most penstemons would supply more than has ever been requested by applicants to all the world's seed exchanges since their inception. A tablespoonful of small seeds will supply many dozens of packets. Many items will only be requested by five to ten applicants in a given exchange. Only in rare cases would a hundred packets of a species be requested, and no one is impressed with the volume of a particular seed you send. At the other extreme, with really rare things, fifty seeds will supply ten packets of five seeds each or twenty-five packets of two each and lots of people would like that chance, so don't hesitate to send painfully small quantities of the rare ones, but don't bother sending such stingy supplies of common things.

The most consistently popular native Northwest seeds include the genera *Lewisia, Viola, Douglasia, Phlox,* and such goodies as *Campanula piperi* and *C. lasiocarpa,* certain choice *Draba, Silene acaulis, S. hookeri, S. ingramii, Eritrichium, Saxifraga oppositifolia,* certain *Aquilegia* and *Penstemon, Synthyris pinnatifida* var. *lanuginosa, Claytonia megarrhiza,* and some *Talinums.* The finest thing a seed collector can do in the wild is discover populations where the choicest forms appear and get seeds from these into the world's gardens. Quite often a native Northwest plant has a bad reputation because the few introductions have been of an inferior form.

Perhaps you'll not accomplish any goals of Greed, Fame, or Honor collecting wild seed. You will help enrich gardens for others in distant countries (*and other sections of your own. — Ed.*) I was surprised how many British gardeners told me they only sought out the wild-collected seeds in exchanges. And you may learn how seeds smell ripening. It gets in your blood — at the time of his death, the writer-collector Reginald Farrer was busy in seed harvest in

China. Methinks he probably died happy.

(There are several reasons why avid plantsmen prefer wild-collected seed: If properly collected and identified, they usually come true — some genera, notably Aquilegia *and* Dianthus, *miscegenate rather freely in a garden situation; it's often the only way, in many cases, to obtain plants, even rather common ones on their native turf, from distant places. If, however, you're unable to collect in the wild, by all means send in seed of the best forms of species from your garden. — Ed.)*

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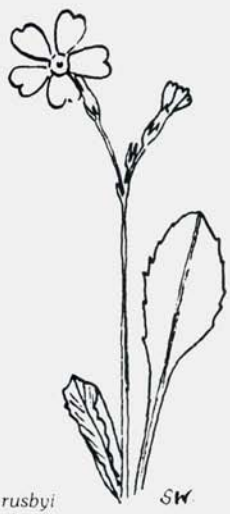
TWO SOUTHWESTERN PRIMROSES

Sally Walker
Portal, Arizona
Drawings by the author

Two delightful primroses are native to southwestern United States.



Primula rusbyi

Primula rusbyi is found in the higher mountain ranges in southern Arizona and southern New Mexico and at least as far south as the Sierra de Chapultepec on the Tropic of Cancer in the state of Zacatecas, Mexico. It grows at elevations of 7,500 to 10,000 feet in the shade of conifers, both on stable screes and on the forest floor, where it blooms in summer during the rainy season. At the tip of a slender stem, up to 25 cm. (10 in.) tall, but usually much shorter, four to eight flowers are produced in an umbel on peduncles about 2 cm. long. From a small mealy calyx, the corolla tube opens into five magenta heart shaped petals surrounding a yellow eye. Each blossom is about 2 cm. (3/4 in.) across. The leaves are basal, about 10 cm. (4 in.) long, nearly half of which is petiole, and 2 cm. wide. They are toothed and rather soft in texture.

Primula ellisiae is more local in distribution. It is found on the summits of the White Mountains and the Sandia Mountains in New Mexico at 11,500 feet. A few plants also grow in the shade of conifers. It differs from *P. rusbyi* in that the flower stems are much shorter, barely surpassing the leaves. The calyx is a bit larger than that of *P. rusbyi* and the flower color a deeper purple. The leaf petioles are margined. It, too, blooms in July and August.

As I haven't gardened since I left England and moved to Arizona, where I

now only collect the seed of such plants, I asked my friend Brian Halliwell of the Royal Botanic Gardens, Kew for information about the cultivation of these two primroses and received the following information from Tony Hall, Supervisor of the Alpine Department at the Botanic Garden:

"*Primula parryi* (the easiest of the North American species to cultivate at Kew), *P. rusbyi* and *P. ellisiae* are now firmly established members of an ever expanding New World alpine collection. These related species, which bloom between June and August, are useful pot plants for our alpine house at a time of year when flower colour is often in short supply, although *P. parryi*, with its coarse and strongly pungent foliage, is the least attractive of the trio as a potted subject.

"Seed should be sown immediately it is gathered, or on receipt, in a mixture of equal parts of leaf-mould, soil and sand. The seed should only just be covered. Plunge the container in a sunny frame keeping the pot and the plunge material uniformly moist. Germination will take place during mild spells between February and May following prolonged cold and/or freezing.

"The container of seedlings should be transferred to a cool glass-house following germination and potted singly in small containers when they are big enough to handle, using a compost of four parts of leaf-mould, four parts of peat, four parts of soil, and three parts of silver sand (*pure white quartz sand containing no iron.—Ed.*) Seedlings should remain in the cool house up to May or until established, when they are transferred to a shady cold frame. They are not plunged, but are watered regularly during the summer. Once established in the small containers they will need to be moved into larger ones, probably in early summer. Good flowering specimens can be produced from seed within eighteen months.

Primula ellisiae

"It is possible that these two primroses are calcifuge so use rain water only. Ample watering is required during the growing season (April to October) but especially when flowering. In the resting period decrease water, avoiding moisture around the crowns, but do not dry out completely. Apply a balanced liquid feed or use granules between July and August at three-weekly intervals.

"Slugs can be a nuisance. The white C shaped grubs of Vine Weevil may be found attacking the roots. Various aphids may feed on leaves and flower scapes and occasionally the roots. Apply a control as soon as these troubles are noticed. Rotting of the crown can occur in winter if over watered. Grey Mould may attack leaves in autumn if the plants are watered from overhead or when there is insufficient ventilation. Apply powdered sulphur to any cut surfaces resulting from removal of infected material.

"For outdoor cultivation, established seedlings were planted out in our woodland garden for trials in May 1978. They were planted in light shade in a leafy,

sandy soil, which did not dry out in summer. There was occasional artificial irrigation in dry spells. These plants survived the following hard winter to flower in 1979 and it is hoped that the free root-run and better light conditions afforded by an outside location will encourage free flowering eventually. I believe that the winter wet, rather than frost, will be the governing factor where these primulas are cultivated out-of-doors in Great Britain."

Lawrence Hochheimer

1895 - 1981

Larry, to his friends, was one of the most evenly balanced men whom it has been my privilege to know, a man of many diverse and unsuspected talents, some not often encountered today. He probably knew verbatim more Gilbert and Sullivan than a score of us put together. Shakespeare was a warm and familiar friend. Multilingual, widely read, widely travelled, he wore his attainments lightly, and charmed all who were fortunate enough to be admitted to his friendship.

For some years prior to 1968 he served the Society as Secretary, and always maintained an active interest in it and in the Connecticut Chapter particularly. He was ever ready with sound counsel when called on, but never thrusting himself forward. Larry's gardening credo was characteristic: to keep this aspect of his life in perspective. If a plant pleased him, suited his domain and seemed likely to be at home in his stone wall, it was his — not otherwise. This wall is a proper New England one, granite boulders, lichen covered, of ancient glacial vintage. There as the spirit moved him, he would take it down in part, chink the interstices with soils appropriate to both the granite and the plants selected for inclusion, and then carefully rebuild. Thus his garden, together with adjacent areas of the heather tribes of which he was fond, grew at his chosen pace. A personal garden, small, manageable, with no pretense nor aspiration to become a comprehensive collection of every known form of Genus X or Y. In short, this garden was for him *recreation*, not his whole life, indeed, far from it.

A story is told in the family of an episode during a trip that he and Irene once took into the Pacific Northwest, which says many things about him — his wit, his instant recall, his attitudes toward plants and, yes, toward some types of fellow gardeners. The tour bus had stopped, everyone had piled out eagerly and hopeful to discover "new" plants — the familiar scene of gung-ho rock gardening enthusiasts touring en masse: all stooped in avid circles over some tiny plant, exclamations here, photographing there, interest at fever pitch. Finally all back in the bus, the usual excited chatter, Latin names flying up and down the aisle. Ultimately, someone asked Larry the inevitable question — what had he found? Then the instantaneous, almost dead-pan response, "Miltonia areopagitica". Retold thus in cold print, this may, unhappily, seem a chilling bit of one-upmanship. But not with Larry, as the twinkle in the eyes and the ghost of a smile would tell.

It is safe to say that, after his family, the chief motivating force of his so-called retirement years was one of service to his community. Retiring from business in the early 60's, he quickly turned his executive energies and expertise to many aspects of Norwalk's civic life, particularly to work with and for the elderly. Among his notable accomplishments was the organizing of a volunteer job placement service for senior citizens of all ranks who, like himself, sought to fill their lives with useful pursuits. Another facet of his service to his city led one editorial writer to call him "the ombudsman of Norwalk". And indeed he must have been so to many: every Thursday, rain or shine, well or not, he kept his office door open to any and all who sought attentive counsel on all sorts of matters. In consequence there came flooding to him in his last days hundreds of heart-warming letters from his fellow townsmen and women expressing appreciation and gratitude for help and attention freely given over many years, spontaneous tributes to his long history of concerned, caring, resourceful and pertinent help to those in trouble. One of the finest appreciations of his work that I have seen is in the closing lines of an editorial in one of the Norwalk papers marking his passing:

"The best memorial to Larry Hochheimer already has been constructed:
it is his own record of accomplishment in behalf of his fellowman."

— MSM

CRYSTAL GARDENING: Painless Propagation

Marie Tietjens
Blue Bell, Pennsylvania

Just what is crystal gardening? It is my simple, efficient and rewarding method of propagating cuttings under glass jars. I use no bottom heat, no misting, no strong hormodin powders. I let mother nature do most of my work for me.

What, when, where and how do I propagate?

What? Anything and everything — azaleas, rhododendrons, dwarf conifers, trees, roses, chrysanthemums, rock garden plants. You name it.

When? Whenever the opportunity presents itself — from January 1st to December 31st. I recall one instance when I was visiting the Wisters' garden in Swarthmore. I had always admired their *Rhododendron mucronulatum* 'Cornell Pink'. I asked Dr. Wister if I might have a cutting and he said, "But, Marie, is it the right time?" I gave him my stock answer. "Dr. John, when the opportunity presents itself, that is the right time for me." And with that, he told me to help myself. So, in the pouring rain, I did just that. The cuttings took and grew into nice healthy plants. I delighted in telling the Wisters of their progress. I have since taken cuttings of the cuttings and have spread the cheer around.

My greatest delight is in giving away plants I have propagated. I have, perhaps, been influenced by some remarks Linc Foster made at one of the Rock Garden Society conventions when Max and I were comparatively new members. He explained the importance of

sharing plants: of extending beauty; when you share a plant, you never lose it because you can always get a cutting back if you lose your own plant.

I am a firm believer in sharing and spreading beauty, and, besides, I have a mania for propagating plants. I *must* propagate anything and everything — especially when someone says it can't be done. My daughter-in-law has spread the rumor that I can propagate a broomstick.

Where? My original propagating bed, which I still use, is a protected area about four by four feet in front of our house, facing north. This is actually a natural Nearing Frame. The cuttings are protected by the wall of the house. Some azalea bushes in front of the propagating bed not only protect the plants but hide the view of unsightly jars. The area gets light but no sun, which is very important. I can strike about a hundred cuttings here. At first I did nothing to the soil, which was the worst imaginable foundation excavation soil. Would you believe that I had tremendous luck with my cuttings? Max has since added quite a bit of peat moss, sand, and humus and has made the soil loose and friable.

I have since encroached on another area, a raised bed alongside the fence of our pool, facing north. We had azaleas here at one time, but they did not do well on account of the shade from the appletree nearby. As Max moved the azaleas, I took over with my jars much to his disgust and horror. He is such a perfectionist that the thought of seeing all those exposed jars, in all sizes and all shapes, just did not appeal to him at all. He called it the "city dump". A friend of mine re-named it the "crystal garden". I like that name much better. Recently, someone called it a "bubble garden". So what's in a name?

How? I take a cutting, preferably one without a flower bud, just below a leaf node. The size of the cutting is dependent upon the size of the plant. If it is a dwarf rhododendron or dwarf conifer, I usually take about a two inch cutting. If it is a medium-leaf rhododendron, I take about a three to four inch cutting. If it is a large-leaf rhododendron or a dogwood or cut-leaf maple, I take about a six inch cutting. I remove some of the lower leaves and if the leaves are large I cut the rest of them in half. At either side of the base of the cutting, I shave off a sliver, about one inch long for a large-leaf rhododendron and much less, if anything at all, on the smaller plants.

As I said earlier, I do not believe in strong hormodin powders. If I use anything at all, it is some old Rootone that someone gave me years ago, which has probably lost all its effectiveness. I then put the cutting right into the ground and put a jar over the top of it. Mother nature takes over at this point. I do not water unless we have a particularly dry spell in the summer. Patience is a virtue at this time. I am not in any particular hurry to remove the jars. From time to time, I lift up the jars to see how the plants are doing. I am a firm believer in the power of positive thinking. I know in my mind that the cutting is going to take — and it usually does. If for some reason it doesn't, I remove it, stir up the soil a bit and put another cutting in its place.

When do I remove the jars? Well, that depends. Instinct guides me. Usually after sufficient growth has been made. Sometimes it takes a year and sometimes it takes two years. The plant can then be moved to a nursery bed for further growth or to somewhere in the garden. Or it can be given to someone who might appreciate it. Since these plants have been exposed to the elements, they will not suffer from transplanting. They are good, healthy, strong plants that should continue to grow well with the proper care.

What is my percentage of success? Well, I tell you. I use Lee Raden's math for propagators. If you take ten cuttings and only one roots, that is 100% success. Why? Because it is one more plant than you had before, so that makes it 100%. If two root, that is 200% and so on.

AWARD WINNERS – 1981

AWARD OF MERIT

Hans Asmus

Visitors, on their way to Wisconsin's Door County Peninsula, following the 1973 ARGS Annual Meeting, had a brief stop at the Mequon, Wisconsin garden of Hans Asmus, where they were amazed by the large and healthy plants of ramonda and haberlea in full bloom. It was soon obvious that there were many other treasures to be seen in that garden. The tour leader faced mutiny when he attempted to get everyone back on the bus on schedule. Shortly after this visit Hans sold that house (and garden), moving to another only a few hundred feet away.

This is not another sad story of lost garden, lost soul. Hans had planned for the move. He had propagated almost all his choice plants and started seedlings of many more; so when he took possession of his new property he was ready. His new property now has more extensive and lovely rock gardens than did the old one.

He grows many plants from seed, some from his own collecting trips. Several of these trips recently took him into the Big Horn and Beartooth Mountains. Many of these collections have been contributed to the seed exchanges of the ARGS, Alpine Garden Society and the Scottish Rock Garden Club. From his collected seed he is growing *Eritrichium*, which he is comparing with *E. nanum* var. *jankaea* grown from seed he received from the Balkans. Asmus has established friendships with alpine gardeners in Czechoslovakia, Germany and Switzerland, first by letter and then by visits. Some very interesting seeds have been passing back and forth, the results of which will be enriching our gardens shortly.

Hans is an excellent photographer who has contributed many slides to the ARGS Slide Library. When the Wisconsin-Illinois Chapter of ARGS viewed the library's primula slides there was a feeling of "deja vu"; many of the slides had been seen in a talk Hans had given a few months earlier. He is also one of the Chapter's most accomplished show exhibitors, with a drawer full of blue ribbons to prove it.

The American Rock Garden Society takes great pleasure in presenting the Award of Merit to Hans Asmus for outstanding horticultural achievement and contributions to the Society. — I.G.

Bozidar (Ted) Berginc

On a forty foot wide lot in West Allis, Wisconsin there is a ranch style house and a driveway extending the length of the lot from the street in front to fan out to the width of a two car garage in the back. Not much room for a garden, yet Ted Berginc has transformed this small

space into one of the most visited rock gardens in the Mid-west. With a sure eye for design and craftsmanship to match he has constructed a lovely garden to house the aristocrats of alpine plants.

The genus *Saxifraga* provides many of the inhabitants here, among them *Saxifraga* x 'Scheeryi', a cushion dome composed of 2cm. diameter silver rosettes tight against each other, each with a little red center button, which eventually elongates into a flower stalk, the whole cushion about ten inches across. Here the mossy saxifrage, *S. trifurcata* becomes a revelation. Its rosettes are much wider and with coarser foliage than the mossy hybrids, yet its cushion is a smooth dome, looking very like a trimmed, soft and open sponge. This is an illusion, however; the cushion is like rock to the touch. There are also many thriving specimens of Engleria and Kabschia saxifrages in this garden, among them *sancta*, 'Faldonside', 'Princess', and *grisebachii*. Other genera well represented in the Berginc garden are *Gentiana, Primula, Douglasia*, including all but the Alaskan species, and androsace, with a number of high alpine species.

All of the species plants in the garden have been grown by Ted from seed and he has experimented with a number of seed media to achieve some remarkable results. Many he grows to maturity in pots in his two well engineered cold frames and when he brings these plants to Plant Shows at ARGS Annual Meetings, they are invariably prize winners.

Ted is a gracious and modest person. His generosity has enriched the ARGS Seed Exchange and both chapter and national plant sales with rare specimen plants.

The American Rock Garden Society takes great pleasure in presenting the Award of Merit to Bozidar Berginc for outstanding horticultural achievement and service to the Society. — I.G.

Victor Reiter, Jr.

By many of his friends and fellow gardeners Victor Reiter, Jr. is regarded as the "Dean of Horticulturists" of central California if not of the entire state. Now nearing the ripe age of eighty years, he has spent the fifty-five years since graduation from the University of California in Berkeley in pursuit of his great love — plants. At that time his father, Victor Reiter, Sr., started gardening in a new home in San Francisco and young Victor joined him in collecting and hybridizing roses, producing some that are still worthy of use in landscaping.

The new home was near Golden Gate Park and the Reiters, father and son, became acquainted with "Papa John" McLaren (famed Superintendent of Golden Gate Park for almost sixty years), and with two members of his staff: Lewis Allen, propagator, and Eric Walther, botanist (later to become Director of Strybing Arboretum in Golden Gate Park). Through the friendship and guidance of these men and many other growers and hybridizers, Victor studied and worked his way into becoming the great plantsman that he is.

At about the same time, young Victor started a one-man nursery on part of the home property, naming it "La Rochette" (The Little Rock). From his friends and contacts he was soon collecting plants and seeds, both from local sources and through importations from all over the world. Among these many plants he acquired hundreds of succulents, and was soon producing new, named clones of echeverias, some of which are still being propagated.

A devastating freeze in December, 1932, obliterated all the breeding stocks of the tender plants in the nursery, so Victor became interested in Mediterranean flora because of the similarity of climates. At the same time he started working with fuchsias, and father and son became very active in the breeding

of this genus. After his father's death, Victor carried on this fuchsia work, eventually writing definitive articles on the hybridizing and culture of the genus.

During World War II, Victor went into war work, but returned enthusiastically to breeding plants after the war was over. He continued to increase his collection until his sales catalog listed over five hundred kinds of rock garden and non-succulent herbaceous plants as well as several hundred succulents, plus dwarf conifers, shrubs and vines, many of them unobtainable from other sources.

There was a constant flow of visiting professionals, advanced amateurs and others to the nursery, all eager to discuss and acquire these rare plants. Victor was generous to a fault (he still is), sharing knowledge, plants and advice; rarely did a visitor, expert or no, leave the nursery without gifts or exchange agreements. Finally, however, the combination of research, collecting, growing, and selling became too demanding and costly, and the nursery was closed.

But Victor did not quit. Not by any means. He still has a constant stream of visitors; he still grows his rare plants by the hundreds; he is still supplying friends and visitors with plants, advice, and genial good-humored friendship. For many years he has given lectures to clubs and societies and recently he has acquired a camera and learned photography so he now can illustrate his talks with his own slides.

Victor Reiter, Jr. is eminently deserving of the Award of Merit from the American Rock Garden Society.

— O.P.

Aline Strutz

Although not formally educated in botany Aline Strutz has acquired an extensive knowledge of the flora of Alaska. What is more to the point, she cheerfully shares her knowledge with one and all.

Born and raised in Alaska, Aline has spent a lifetime locating, collecting and studying the flora of her native state. She is perhaps more familiar with this flora than most trained botanists and is frequently requested to lead both professional botanists and professional and dedicated amateur horticulturists to the areas where they grow. This Aline seems always willing to do and, though well past three score years and ten, she will still sprint up mountain slopes like a bird dog in search of an elusive plant at a pace that frequently leaves her followers, even those half her age, gasping far behind her.

She shares other things as well, such as seeds and plants. She has been participating in the seed exchanges for years, not only that of ARGS, but also those of England, Scotland, and British Columbia. She carries on a voluminous correspondence with wildflower enthusiasts in other parts of the United States and the world. She is forever answering their questions and sending them seeds and plants.

Aline has been collecting Alaskan plants for many years and she has furnished these to various herbaria. Many of these plants now grow in her wildflower garden, which is extensive and contains more than two hundred species of Alaskan wildflowers in addition to cultivated varieties and wild plants from other areas. According to those who have visited her fascinating garden, she has the greenest thumb of anyone in Alaska, and an Alaskan friend says "If Aline can't make something grow there is no use in anyone else trying."

As shown by certain illustrations in *The Alaska-Yukon Wildflower Guide*, Aline is also an excellent photographer. She probably has photographed more Alaskan species than anyone else.

For her high horticultural achievement and many contributions to rock gardens and rock gardeners all over the

world, Aline Strutz is particularly well suited to be a recipient of the Award of Merit of the American Rock Garden Society. —H.W.

Marcel Le Piniec Award

Wayne Roderick

It is specified that the Marcel Le Piniec Award be "given to a person who, as nurseryman, propagator or plant explorer, is currently and actively engaged in extending and enriching the plant material available to American rock gardeners." Wayne Roderick of Orinda, California well qualifies in all respects to these specifications, plus being involved in other horticultural activities.

He was born into a flower loving family. His parents ran a florist shop in Petaluma, California and as a boy and young man Wayne worked in the shop, making professional flower arrangements. At the same time, he was planting and growing plants on his own.

He became a gardener at the University of California Botanical Gardens in Berkeley, ultimately becoming Horticulturist. Having been interested for a long while in California native plants, he was placed in charge of the California native plant area of the Gardens. In addition, he could also indulge in growing plants for himself. He also joined with others in plant collecting. Together with Arthur Menzies of the Strybing Arboretum in Golden Gate Park, San Francisco, Margaret Williams of Sparks, Nevada, and other friends he made almost weekly exploration trips the length and breadth of California. He collected plants, bulbs, and seeds of native plants for inclusion in the Botanical Gardens, propagating the results of his collections and ultimately making an extremely well thought of and popular native plant garden. In one area he constructed a granite scree with several tons of rocks from the California High Sierra, in which he planted an alpine garden containing many Sierran alpine plants formerly considered almost impossible to grow in the mild sea-level climate.

A few years ago he was appointed to the position of Director of Tilden Park Botanic Garden situated in the hills behind Berkeley. This garden consists of native plants only and Wayne's experience and training exactly fitted his new job. Here, along with his staff and many volunteers, he has created a splendid educational horticultural exhibit considered one of the best of its kind.

In addition to his appointed work, Wayne maintains his own noteworthy private rock garden in which he grows rare plants collected from many sources all over the world. Through acquaintance and correspondence with many other highly placed plantsmen he has obtained seed, bulbs and plants, not only for Tilden Park Garden and his own garden but also for distribution, along with seeds, plants and bulbs resulting from his own collecting. Such activity is in high accord with the Le Piniec Award requirements. In addition to his exploration for native Western American plants, Wayne has hunted for plants in South Africa, North Africa and Spain, among other locations.

He has given freely of his time for lectures to many local and foreign plant organizations including annual ARGS meetings and the International Rock Garden Plant Conference in Harrogate, England, in 1971. He has written many articles on the plants in which he specializes and these have been published in various horticultural journals. Among the many plants about which he has become an authority are brodiaea, lachenalia, fritillary, narcissus, lewisia, arctostaphylos and pleione, along with many others.

Wayne Roderick is thoroughly qual-

ified to be included as one of the American Rock Garden Society's greats to deserve the Marcel Le Piniec Award.

— O.P.

PIKES PEAK — And How the Tundra Got There

Lucian M. Long
Colorado Springs, Colorado

I have often wished to have a time machine with the dials set to the 14th day of July, 1820 when Edwin James and his two companions first saw the tundra and the masses of astonishingly brilliant mat plants on top of "Grand Peak".

Captain Zebulon Pike and his "dam'd rascals" had first seen the "highest peak" from a distance on November 15, 1806, but failed in an inept attempt to climb it — exploring South Park instead. A member of the party, Dr. John H. Robinson, published a brief report of the trip in 1819 and on a crude map called the peak "Pikes Mountain." On a map published several years later it was called "James Peak". Eventually the two were combined to become Pikes Peak. Later, another botanical explorer, Dr. C.C. Parry, named a different peak for James.

Many words have been written about the unparalleled beauty and the exquisite excellence of tundra flowers, but until recently not much thought has been given about where they came from.

As I pointed out in *The Green Thumb*, published by the Denver Botanic Gardens (Vo. 36, No. 2, Summer 1979, p. 46), Colorado tundra plants have migrated from the north, following the higher elevations of the Rocky Mountains.

The concept of Plate Tectonics has now been fairly well accepted for about 15 years by most scientists around the world as being the only way to explain Continental Drift. There are still many pre-existing ideas which will have to change, but many former quandaries can now be resolved.

The circumboreal plants, some of which eventually reached the Rockies, probably originated on what is now known as the Arctic Plate, which was originally located to the north of Greenland. This plate moved westerly even faster than the North American Plate (after they both pulled away from Europe) and eventually it turned slightly counter-clockwise and collided with Siberia about 45 M.Y.A. (million years ago). The Arctic Plate, caught between Siberia and the North American Plate, included eastern Siberia, Kamchatka, and western Alaska, creating a solid land link between northern Asia and North America from about 45 M.Y.A. to 12 M.Y.A. when a large fault opened the Bering Strait. This opening was filled in — probably by erosion — by about 9.9 M.Y.A., but then, about 4

M.Y.A., the Bering Strait opened again even wider than before. In later periods other "land bridges" existed between Siberia and North America because of lower levels of the oceans during the ice ages. These permitted the peoples, later to be known as the American Indians, to cross from Siberia. Plants from Asia also migrated across this link of land. A mixed mesophytic forest extended from Japan to Oregon.

In Alaska, the tundra can exist near sea level because of the cold northern climate, but as the tundra plants migrated south they were relegated to the heights and were unable to extend their range beyond the mountains of northern Arizona and New Mexico. A few plants, which can withstand more heat, have progressed nearly to the Mexican border, yet some others have not even reached as far south as Colorado.

The migration of plants is a slow process, depending as it does on generation after generation extending their range by sowing into suitable locations. Some plants seem to remain the same through the centuries of migration, others go through genetic changes as they move from one site to another. In some cases plants that change significantly become relegated to a particular area and may be designated as endemic species — occurring in no other place in the world.

Kings Crown (*Rhodiola integrifolia*), whose deep red to maroon flowers, sometimes tinged with yellow or orange, are among the most brilliant on Pikes Peak, is a member of a widespread genus. There is a species in the Arctic, with yellow to rose flowers, called *Rhodiola rosea* and in the mountains of central Asia is another species called *Rhodiola semenovii* with a more rounded cluster of blossoms. This, last is very like the pink to white-flowered Rose Crown or Queens Crown (*Clementsia rhodantha*), endemic to the Rockies. *Clementsia*, frequently listed as *Rhodiola*, was named for Frederic E. Clements, who founded an alpine laboratory at Minnehaha on the east side of Pikes Peak during the early part of this century. (*Both* Rhodiola *and* Clementsia *are, by some botanists, classified as* Sedum *— Ed.*)

Pikes Peak, although 14,110 feet in elevation, is not on the Continental Divide. The Pikes Peak massif was formed by a pulse of molten rock forced up from deep within the earth during the second of three mountain building episodes in Colorado. The time of this event is difficult to establish, but took place later than most of the other "basement rock" formations and probably occurred about a billion years ago. The rock cooled slowly, obviously far below the crust, to form a pink coarse-grained granite. As the Colorado Rockies were pushed up (about 50 to 45 M.Y.A.) this rock was exposed and the entire area continued to rise very slowly until about 10 M.Y.A.

The Pikes Peak massif is at right angles to the Continental Divide and is isolated about 75 miles east of the other high peaks. The only way high tundra plants, which require cool conditions, could have reached the Peak would have been to migrate during the ice ages, which reached a maximum about 20,000 years ago. Blanca Peak, about 100 miles to the south, still cradles the southernmost glacier in North America. Having been isolated for, perhaps, 10,000 years, many of the high altitude plants at Devil's Playground on Pikes Peak have become endemic, differing from other Colorado tundra flora. They are noticeably different from those on 14,264 foot Mt. Evans about 60 miles further north on the Continental Divide.

The Borage Family (Boraginaceae) must be very ancient for it is widely distributed around the world. It is, perhaps, best known among gardeners for

anchusa and borage, but there are about 85 genera in this family and over 1,500 species, many of which are designated as endemics. Among these are the beautiful Chatham Island Forget-me-not (*Myosotidium hortensia*), a monotypic genus difficult to grow even in nearby New Zealand.

Though the state flower of Alaska, *Myosotis alpestris*, has migrated into the northwestern corner of Colorado and has been found on the White River Plateau between Yampa and Meeker, it does not appear on Pikes Peak, though its relative, Stickseed Forget-me-not (*Hackelia floribunda*), a tall coarse plant, does grow below the tree limit on the Peak as well as in other areas of the Rockies.

But the coveted member of the Boraginaceae (at least among rock gardeners) is eritrichium with representatives in Asia and Europe as well as in North America. Several variants of *Eritrichium nanum*, sometimes listed as separate species under the names *E. howardii*, *E. elongatum* and *E. argenteum*, occur in the Rocky Mountains. Also occurring in Colorado is another variant or separate species *E. aretioides* (depending on the botany you consult), appearing otherwise only in Alaska and Siberia. White flowered mutants of this usually blue-flowered plant are occasionally seen in the southern Rockies, and on Pikes Peak, at Devil's Playground, there are, in addition, two sizes of these diminutive eritrichiums, each size with flowers of a slightly different blue.

Another member of the Boraginaceae common in Colorado is mertensia, often called bluebells, though the blossoms, on close inspection, resemble those of forget-me-not rather than those of bluebells. There are several species as the altitude increases: *MM. lanceolata, ciliata, viridis* and *alpina*. This last is very common on the high tundra of Pikes Peak and it is found only there, the only mertensia in Colorado above timberline.

The Many-flowered Puccoon (*Lithospermum multiflorum*), another member of the Borage Family, this one with yellow trumpet shaped flowers, is common from the mesas to tree limit from Wyoming south to Mexico. It is of interest to botanists because of the variations in the form of its blossoms. Still another member of the Boraginaceae, this one occurring in Colorado and southeast Wyoming, is Miners Candle (*Cryptantha virgata*), which is well represented along the Cog Road on the east side of Pikes Peak. A stiff bristly plant with white forget-me-not flowers in the axils of the leaflike bracts, it makes one think of a miniature echium.

Pikes Peak can be reached by Cog Road or by automobile. Perhaps the best way to see the flowers is by the automobile toll road. There are two areas where it is convenient to view the tundra: Elk Park, overlooking Bottomless Pit; and Devil's Playground, west of the top. At Elk Park there are a number of rare plants, among them: Kings Crown (*Rhodiola integrifolia*), Old-man-of-the-mountain (*Hymenoxys grandiflora*), Rock Jasmine (*Androsacae chamaejasme*), Purple Saxifrage (*Telesonix jamesii*), Halls Alpine Penstemon (*Penstemon hallii*), Alpine Paintbrush (*Castilleja puberula*), Snow-lover (*Chionophila jamesii*), Alpine Mertensia (*Mertensia alpina*), Dwarf Columbine (*Aquilegia saximontana*), Moss-pink (*Silene acaulis*) and Nailwort (*Paronychia pulvinata*).

Devil's Playground is more typical of high alpine tundra. Of particular interest are the endemic Alpine Parsley (*Oreoxis humilis*) and *Eritrichium aretioides*. In addition there are many other tundra plants such as the Fairy Primrose (*Primula angustifolia*), Golden Draba (*Draba aurea*), Snowball Saxifrage (*Saxifraga rhomboidea*), Wild Candytuft (*Thlaspi montanum*), Alp Lily (*Lloydia serotina*)

and Alpine Kittentails (*Besseya alpina*).

Visitors to the Colorado tundra are fascinated by the variety of plants found in the beautiful natural rock gardens there and agree with Edwin James that it must be the bright sun on Pikes Peak which makes the flowers so brilliant.

THE LAMIUMS: Their Usefulness and Limitations

Mrs. Ralph Cannon
Chicago, Illinois

Many plantsmen think that foliage is much more important than flowers in a garden. In many ways this is definitely true. Green is the main color in a garden and until a green background is obtained the flowers cannot be properly seen as a focus of interest. Of course, the green background can be interrupted and brightened by the blending of some variegated foliage. The lamiums can be used in this respect for their blends of silver, gray and gold, though these are less easily found than the solid greens. One needs to be cautious about recommending lamiums to one's fellow gardeners as they can be invasive, but there are cultivars that are as well behaved as they are beautiful.

Besides using foliage plants as a background to flowers, they have another function — covering the ground. In nature, where soil and climate permit, all ground is completely covered; in gardening we should strive to keep the ground covered with something too. Generally, herbaceous plants come first to mind and here lamiums are suitable and well qualified for they colonize rapidly.

Lamiums are herbs belonging to the Labiatae or Mint Family. Mint, sage, hyssop, lavender, catnip and thyme are among its members. This family is one of the most commonly represented in North America. The vernacular name for lamiums is "dead nettle". In general, the leaves are simple, hairy, opposite and toothed. The flowers are two-lipped and are borne in clusters in the leaf axils or as terminal whorls. They have a five-lobed corolla, two or four stamens, one style, two stigmas, and a superior ovary. The fruit is composed of four one-seeded nutlets with the calyx enclosing them.

One species that has been used in our gardens for many years is *Lamium maculatum*. It likes a moist soil but will also grow in dryish garden soil. It does well in shade. It produces a dense low carpet in a short time. The hairy, dimpled, cordate leaves, about two inches long, with a broad silver stripe and some white blotches running down the midrib of each leaf, are most attractive. Rosettes of pinkish-purple two-lipped flowers are borne at the nodes throughout the summer. It is too invasive for the regular rock garden and should be relegated to other places: for edging to pathways, beds or borders. There it will sweep into the path and make an uneven line that is most satisfying as one strolls along. This species used in a woodland or wild garden remains in the memory as a perfect example of imaginative planting.

A white form, *Lamium maculatum al-*

bum is available, although not common. It is like the type plant with the exception of the quite showy white flowers.

Another very striking cultivar of the species is *Lamium maculatum* 'Aureum' with bright yellow foliage. The leaves are shorter and the growth habit more prostrate and compact than in the species, making it a fine low growing plant. The flowers are pink or purple. The leaves are somewhat undulated and keep their bright yellow color throughout the season of growth. Yellow is a popular color in spring because it harmonizes well with the excitement of the opening of the gardening year and this lamium will brighten a shady spot like a patch of sunlight. This cultivar is as well behaved as it is beautiful and can be used in a rock garden or in the forefront of a flower border. It is not rampant and may be safely associated with other plants. Also lovely and restrained in growth habit is a new cultivar, an English introduction named *L.m.* 'Beacon's Silver'. In this plant the silvery splotches on the leaves are so enlarged as to render the foliage nearly pure silver.

Another species of lamium, (best known in its variegated form) is *Lamium galeobdolon* (now reclassified as *Lamiastrum galeobdolon galeobdolon)* known colloquially as the Yellow Archangel. This is a plant which, though it is a vigorous spreader, takes time to form dense carpets. It grows in the same manner as does vinca, sending out long looping shoots, which must criss-cross before they cover the surface.

The leaves are large, lovely and mottled by various shades of green over which is sprinkled an arc of silvery dots. Planted in shade in a soil into which leaf mold has been worked, it will rapidly spread to cover what was previously bare ground. The non-flowering runners will root at the tips when they arch down to touch the ground and thus form new plants. This plant will grow in dry shade and can be a blessing in some areas as long as you can keep it within bounds by mowing or clipping back the edges, but left to its own devices it can become a nuisance. The spreading variegated verdure and not unattractive heads of pale yellow, two-lipped blossoms will cover almost any eyesore you want to hide: an unattractive wall, a rough steep bank where little else will grow, the bare patches under large trees or shrubs, as a cover over spent bulb foliage. It should, however, be kept away from other plantings as this plant needs room to sprawl and it can be embarrassingly prolific. Only sturdy growers can compete with it. If it does begin to wander into territory where it is not wanted, use a sharp spade to cut off the invading stems as they appear.

It would be a serious omission not to mention *Lamium armenum*. Roy Elliott, writing in *The Journal of the Royal Horticultural Society* (1973), tells about this fine new lamium introduced from Turkey in 1966. He describes it as one of the finest plants of the last decade, saying it was nearly lost to cultivation because recipients of the seeds refused to believe that "Lamium sp." might turn out to be a notable plant. He describes it as an unusual plant for the garden. Growing very compactly, it behaves itself and can be trusted to keep to its assigned territory. The soft pink flowers, which are borne in large numbers, add to its charm. This lamium seems to be a rarity to be assiduously sought and cherished when discovered.

The lamiums look after themselves and are easy to grow. Propagation of all is simple: by seed, lifted pieces, or cuttings, which strike quickly. This latter is probably the easiest way to increase if many plants are desired.

There are so many places in most gardens where lamiums can serve an invaluable purpose as a weed smother-

ing, low growing, decorative ground cover or as unusual plants with magnificent foliage. Every garden has plants that vary from one garden to the next as shade, soil, fertility, acidity, and moisture differs. The gardener doesn't deserve credit because some plants grow rank, but he does deserve credit for recognizing their usefulness and limitations.

Olga Lewis

It was with deep sorrow that we learned of the death of Olga Lewis of Bellevue, Washington, long time member of the ARGS, the American Penstemon Society and the Alpine Garden Club of British Columbia, whose courage and good humor during long years of suffering have won the admiration of us all.

Olga loved plants and people and spent her life in service to both. She never lost her British accent, but the United States was her chosen country and she was never happier than on plant hunting expeditions in the wild.

Olga and Cliff built a beautiful garden and shared their knowledge and their plants with all who came. In 1980 they were jointly awarded the highest honor given by the ARGS for their work for the Society.

Plantsmen in the Pacific Northwest will miss Olga Lewis for her unfailing sense of humor, for her hard work (she helped proof-read the Interim International Conference Report), and for her ability to make things run smoothly.

The sympathy of all alpine gardeners is extended to Cliff Lewis in the loss of his wife and companion of so many years. — A.W.

Thymus Lanuginosus As A Lawn

Daniel C. Weaver
Hamden, Connecticut

Hortus Second lists, but does not describe, *Thymus lanuginosus* as a variety of *Thymus serpyllum*. *Hortus Third* lists the plant as *T. pseudoserpyllum* and describes this and other Thymus as follows (paraphrased):

THYMUS. Labiatae. 300-400 spp. Aromatic small shrubs or per. herbs. Eur. Asia. Usually prostrate or creeping. Woody at base (at least). Mostly square in cross-section. Lvs. opp. entire. Most thymes grown in American gardens appear to be of confused identity and erroneously named. . . .

T. lanuginosus. Mill. Closely allied to *T. serpyllum*; not known to be cult.; material listed under this name is *T. pseudoserpyllum*.

T. pseudolanuginosus. Mat-forming, creeping per., scarcely 1/2 in. high, sts. woody at base; lvs. broadly elliptic, about 1/8 in. long obtuse, hairy on both sides; fls. few in lf. axils, corolla pale pink, about 3/16 in. long.

Whatever the proper botanical name, *Thymus lanuginosus* of the trade can create a pleasing lawn. While one might, as a design purist, prefer that no blooms appear, appear they do. Seeding does occur and, as with *T. serpyllum* varieties, seedlings show up even in places fairly remote from the planting and must be removed ruthlessly and early from areas where more delicate, choice plants are grown.

In general, Wooly Thyme is highly satisfying. Its gray-green, densely hairy leaves provide a non-garish carpet, turning to gray-green with purplish overtones in winter. If "properly" grown — i.e., slightly out of character — the mats are quite even and intermingle freely. Minimizing the sub-shrubby character of the genus is esthetically desirable in the lawn.

When established *T. lanuginosus* is reasonably drought resistant. Indeed, it will succumb if continuously inundated for any period. While it flourishes in full sun, foliage may die in prolonged heat (100° F.) unless roots are moist. However, most plants recover. Generally plants survive severe winters, although excess brine from snow-ice removal causes death of foliage at street edges. Mats will reform, however, over added gravel as described below.

Dense mats resist weeds, but weed seeds, which can sprout between the thyme plants as the runners advance, will flourish. Well established areas of a hundred by thirty feet require little maintenance. (Weeding is best done with a dental tool — blunt, curved end, lifting the thyme foliage to isolate the weed. Scraping weed roots out of the soil, away from the hand, while firming soil occupied by the weed works well.) "Deep watering" (the only way to water) when required, is necessary for the health of the existing tap roots and to promote further deep rooting.

Initially, I surrounded my plants of Wooly Thyme with wood chips to smother the grass and weeds that inevitably appeared after removing the conventional grass-and-weeds lawn. Wood chips in this case proved an error. The thyme runners did not form abundantly and the plants became quite shrubby. They frequently died after several years. Chance led to a more satisfactory method of cultivation. An abutting area of coarse sand revealed a predeliction of thymus for sand; runners crept onto it and a lush mat soon formed. This prompted me to experi-

ment with sand in another area, already languishing. Sand was forced under the mats. Rooting occurred and growth became more dense. This treatment was then extended to other areas. But, as always, prevention is a better cure. Now I plant thymus directly in coarse sand as I do many plants. Seedlings on my sand pile grow roots four to six inches long by the time they are transplanted.

Our local coarse sand is pinkish-brown and is freely interspersed with small pebbles (perhaps 10% by volume). It is called construction sand by our local purveyor. Its pH is unknown to me. There is obviously considerable nutrient value. Runoff of water is dark orange in color. Predictably the sand will settle, as much as 30%, if delivered or used dry. This sand drains well at the surface but at a depth of two inches (especially if over moist soil) will retain some moisture for considerable periods.

Thyme runs over it freely and often roots down. This plebian medium serves as an excellent bed for weeds as well as for thymus seeds. However, weeding is quite easy and, if accomplished early, thyme seedlings are not threatened or damaged. Parent plants rarely become shrubby on this sand base, a decided advantage for a lawn.

Until three years ago I hesitated to feed my thymus lawn, although I top-dressed it with humus and sand. Now I also add a modicum of bone-meal in late March. Results have been gratifying so this treatment will probably be permanent.

Does the thymus lawn survive traffic? If plants are shrubby, considerable damage will be done by feet or garden carts. Bare feet (visually and texturally this Wooly Thyme is most inviting) are not harmful. Prolonged exposure to trauma can be fatal, however. One section of my lawn was destroyed during construction of the alpine greenhouse. A scaffold-way in such an eventuality is indicated. Scooting along on my pillow, as I sit to weed, is not a problem for the plants, but this is more safely done when the plants are not wet. Heavily trafficked areas require stepping stones or paths, a requirement for any ground cover.

Establishing new mats from rooted cuttings or from layers with roots is quite simple: planting can be done directly into sand as mentioned, even in midsummer, if kept moist. Large clumps, or cuttings grown to plants in pots, require more care. Large mats can be divided with a spade into sods with a depth of ten to twelve inches and placed in a hole of similar depth containing a "gruel" of water, sand, and soil. Such clumps may contain a tap root or so but will certainly have a tangle of fine roots which require the exclusion of air pockets.

Establishing a thymus lawn can be done gradually. For the impatient it must still be dependent on a commitment to propagate. It is moot whether areas are covered more quickly by planting cuttings with roots directly into the lawn area or into pots for later replanting. Since "maintenance free" is a relative matter, one needs only to decide whether one wishes to work awhile and wait — or cut grass.

A casual warning: if you wish to be left undisturbed by inquiries and/or compliments from passers-by and all service people, do *not* create a *Thymus lanuginosus* lawn.

A weed is a plant whose virtues have not yet been discovered.
— Ralph Waldo Emerson

NEW YORK BOTANICAL GARDEN ILLUSTRATED ENCYCLOPEDIA OF HORTICULTURE
by Thomas H. Everett, 1980-1981, Garland Publishing, Inc., New York, N.Y. $52.50 per volume, $525.00 for complete set of 10 volumes.

The first three volumes of this impressive ten volume master work were released in 1980 and the remaining seven are promised at six week intervals during 1981. This is a major publishing event to start with. The prepublication price of $52.50 per volume does not seem excessive in today's market, nor $525 for the full set.

What is even more impressive is the content of these volumes. Generally for a work of this dimension, and of this authoritative quality, there would have been a large band of horticultural scholars assigned various facets of the work, to be brought together and edited by an over-all board. In addition there would have been another "task force" assigned to rounding up a set of pictures.

What makes this Encyclopedia of Horticulture unique is that it is the work of one remarkable man, Thomas H. Everett.

Tom Everett is a large and voluble man, as all the thousands of devoted horticulturists who have known him will attest. This encyclopedia is a compact and structured summary of that prodigious encyclopedia that is Tom Everett in the flesh.

He started his formal training in the plant world, in what we now look back on as the hey-day of horticultural training, at the prestigious Royal Botanic Gardens at Kew in England. When he came to America, jovially bearing his English heritage and training, he became attached to the premier botanical garden in America, the New York Botanical Garden — or one might say vice-versa. His presence at the N.Y. B.G. was quickly felt. His erudition and energy moved him quickly into positions of Director of Horticulture, Superintendent of Maintenance, and Senior Curator of Education at the Garden. His outreach meanwhile was as broad as his charm was infectious and his knowledge deep. He has been a favorite lecturer before garden clubs and scientific societies.

Meanwhile he was storing away notes and files on thousands of plants. He personally worked with most of them as he expanded the diversity of the plantings at the gardens in the Bronx. At the same time he was photographing plants himself and building up a stupendous file of photographs and slides of plants and all aspects of horticulture. For the past ten years, since his retirement from official duties at the Garden, he has been structuring this great encyclopedia.

The ten volumes, packed with something like three million words and ten thousand photographs — a number in color, all carry the mark of this remarkable man. He knows his subjects thoroughly and he knows how to convey his information to an audience. There is here careful research, including the most recent name changes in the literature, and very precise advice on growing all kinds of plants. It is all based on practical experience as one can see from the text and the photographs. One suspects that frequently the pictures of hands and feet illustrating gardening practices may be the extremities of T.H. Everett himself.

This massive and elegant work, speaking as it does to every layer of the horticultural community, positively supplants all previous pretenders in the field. In fact, it probably will, and should, daunt any challenge for a long time to come.

I personally perused all sections of the work about which I feel myself fairly well informed and so far, through the first three volumes, I could not fault an entry. I feel sure that the standard will hold throughout.

For instance, I pored over the entry under Campanula. It was thorough and precise. All essential information was compactly and expertly presented for the rock gardener, for the border enthusiast and for the houseplant or greenhouse devotee. There are descriptions of all species (except the rarest) cultural advice, landscape uses — all sorts of packed information, yet not stilled into a frozen computerized syllabus.

There are ample cross-references: alpine plants are briefly described with a reference to rock gardening. I can't wait to lay my hands on the volume for that reference.

All I can say, and most honestly I say it, here is an elegant work of monumental proportions. If I could have but one reference work in my library this set would be it. — H. Lincoln Foster

A Few Thoughts About the Rock Garden

Of all the many, many words on rock garden constructions as suitable places for the happiness of rock plants, those of Marcel LePiniec (ARGS Handbook, p.13) come to mind as important to remember: "Avoid using too much rock; simplicity and restraint [are] the unsuspected companions to success." Yes, how often we find those stratified and laboriously constructed — and maybe even eye-pleasing — simulations of natural geologic formations to be totally unsuited to growing the sort of choice plants we would like to enjoy.

And on the subject of space, we should learn from the words of W.D. Blair, who wrote in ARGS Bulletin, Vol. 8, No. 1: "There is more to a rock garden than its flowers, rocks and shrubs. There is space — all-enveloping space, all-embracing space." Wonderful.

Keeping in mind these two admonitions, we can, perhaps, avoid premature ageing of our rock gardens. But there is no rock garden anywhere (nor any kind of garden that can be called a true garden) that does not require maintenance. Most of us are ambitious to an unsuspected degree when we commence building. There is a very well

posted sign at the entrance to C.L. McDonald's jewel-box garden in Salem, Oregon: "The garden must be very small or you will have no fun at all." ('Nuff said?)

But having made all the mistakes, we can take the advice of Linc Foster who tells us in the ARGS Handbook, p.5 how to go about "instant renovation" through rejuvenation of the soil. Nevertheless, in order to really be what the gardener wants, the successful rock garden absolutely must be lived in and worked in. Thus rock gardening, as we well know, is the most personal and intimate of all forms of plant cultivation, at least in the open garden.

To help the novice, as well as other rock gardeners, the Natural Divisions of the Rock Garden as explained by Correvon are here recounted (with slightly revised explanation):

Deserts — openly exposed; rough soil; water never stands; [on highest garden areas.]

Cliffs — openly exposed and nearly barren except for lichens, mosses.

Naked Ledges — eroded cliffs; crevice plants in a variety of exposure.

Screes — accumulated rock from ledge disintegration; cool deep root-run; free draining; sunny.

Moraine — differs only in being subirrigated; open or sheltered.

Alpine Meadows — broad and with deep, moist soil; mainly open.

Bogs — constantly wet, spongy soil though well-drained; protected or open.

Pools and Streams — for draining excess moisture away; [on the lowest areas.]

Only an extensive garden area is likely to accommodate all these ecological divisions; yet with care and understanding, the devoted gardener-student of plants may grow representatives of a great part of them, and at an increased concentration of his efforts as well as the bounty of pleasures on his successes.

— R.D.

It Ain't Necessarily So

"It ain't necessarily so" — That is, the statement that seed of anemone *has* to be fresh in order to germinate.

Being of Scotch descent, I do not like to throw things out, and that goes for seeds. I never plant all of the seeds in a packet; I put the remainder, still in their original envelopes, in a plastic freezer container in the back of my refrigerator, just in case.

In 1980, in those dreary days of February, while waiting for fresh seed to arrive, I planted all the older ones.

I plant my seeds in those plastic packs (six compartments or four) in which bedding or vegetable plants are sold at the market. I fill each compartment with Fertilmix and tamp it down, soak the pack in warm water, plant a different variety of seed in each compartment and slip the pack into a fold-lock sandwich bag. Then I place it in a fairly warm place and keep a sharp eye on it.

Quite a number of the seeds that I had had for five years, among them *Encelia farinosa* and *Pedicularis groenlandica*, and other fresher seeds, which had not germinated at the first sowing, such as *Sisyrinchium douglasii*, which I have been told takes two years to germinate, came up.

So this year I decided to try again, earlier, before Christmas in fact, as I had received some western seed from Sally Walker in Arizona. I planted a portion of these and soon had nice stands of dodecatheons and primulas. Unfortunately, a wee beast of a mouse wanted

greens, darn him, so I replanted using the remaining seeds plus some of *Anemone tuberosa* from the previous year, one of which has come up. *Anemone sylvestris* had germinated the previous year from fresh seed, but I planted some of the held over seed anyway and they also germinated along with two seedlings of *Campanula lanata*, which had not germinated the year before from fresh seed.

I do my seed sowing under fluorescent lights in the bedroom as I have no basement. I use just ordinary four foot "shop lights" with cool white bulbs, hung on brackets with a shelf under them.

As of February 2, 1981 I had seedlings of *Arnica chamissonis*, *Anemone sylvestris*, *A. tuberosa*, *Alyssum serpyllifolium*, *Campanula lanata*, *C. americana*, *Cephalaria alpina nana*, *Dodecatheon radicatum*, *Dianthus neglectus*, *Draba dedeana*, *Galega*, *Geum*, *Gilia*, *Hedysarum*, *Hymenoxys acaulis*, *Lupinus lepidus* var. *lobbii*, *Oenothera kuntheana*, *Primula parryi*, *P. rusbyi*, *P. ellisae*, *Petalostemon villosum*, *Ptilotrichium spinosum*, *Roscoea cautleoides*, *Scabiosa lucida rosea*, *Saponaria ocymoides*, *Saussurea*, *Calceolaria acutifolia*, *Callirhoe digitata*, *Erigeron compositus* and *Calliandra eriophylla* sprouting happily under my lights. Among the few I have not succeeded in germinating in this manner are saxifrages, androsaces, and *Gentiana verna*.

When the seedlings are above ground I replace the sandwich bags with larger food bags, making individual "greenhouses" over each pack. Later the young plants are moved into individual styrofoam cups with bags over them as the air in the house is too dry for them in winter if exposed.

— Flossie O. Dawson
Owasso, Michigan

. . . of Cabbages and Kings . . .

When one is owned by a garden it is difficult, indeed, to be bored for lack of occupation. Every day of the year can be filled with the gathering and sowing of seeds, the pricking out and transplanting of seedlings, with pruning, trimming and clipping, weeding and roguing, planting and planning, with reading about and searching for new and untried plants, with adding or removing a plant or two, and at times renovating an entire planting or even in changing major sections of the landscape. One can be sure, when admiring a beautiful garden, that it receives the constant loving nurture and firm controlling hand of a devoted gardener.

But just as the garden needs the gardener, so does a gardener need a garden. It is a symbiotic relationship.

Imagine a true gardener deprived of a garden. A nongardener will exclaim, "But it's so much work!" A gardener glories in the work. He rises with the sun, glowing with happy plans for a full day of hard labor among his flowers, and goes to his sleep with dreams of better plants to grow. Though he tends to solitude and silence while practicing his art, he is happily vociferous when conversing (in the plantsman's somewhat arcane vernacular) with others of his ilk. With them he can discuss problems of seed germination, fungus disease and soil mixtures, share his triumph in flowering *Paraquilegia grandiflora* and mourn his failure with *Primula cawdoriana*. Together they can condole with each other over the early death of their *Meconopsis betonicifolia*. In the most extreme cases of this monomania, the welfare of a gardener's plants will

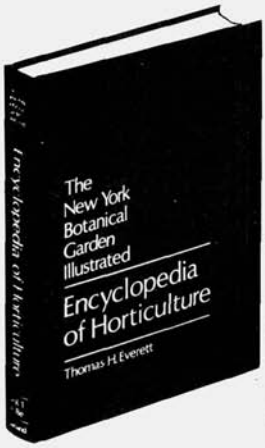
take precedence over that of his wife and children. A gardener is a confirmed complainer (too much rain or not enough, too hot or too cold), yet he is an eternal optimist (things will be better next year). He is at his most content when, in filthy sweat soaked clothes, with muddy hands and boots, he is admiring his present project or contemplating a new one.

And, it is possible that the urge and, indeed, the need to improve, renew and expand his garden is, despite the minor ailments of aching knees and creaky back that in time afflicts all plantsmen, one of the reasons for the frequent longevity of gardeners. Not only does the continual activity get them out in the fresh air and give them exercise to a greater or lesser degree depending on their ambition and strength — an essential for good health according to doctors who now recommend mild but regular exercise even for heart patients — but it creates a tremendous will to live. A true gardener, no matter how ailing, will fight off death like a veritable Horatius if only to see how a new planting of primroses will look when it blooms the following spring.

We have gardening friends who are still hybridizing rhododendrons at age 75 and planting tree seeds at 80. Though the likelihood of his seeing the mature results of his work is, perhaps, expecting too much of even the most persistent human frame, it is quite possible that Methusela yearly planted olive pits and lived to press the oil from the fruit of his trees.

Imagine knowing as much about the rest of gardening as you do about rock gardens

Globe artichoke



Acrocomia aculeata

Left: Arabis caucasica flore-pleno with, at the left, *Iberis sempervirens* in a rock garden.

Perhaps you know as much about rock gardens as anyone you know.

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