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# The Bulletin

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# Bulletin of the American Rock Garden Society

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## **EASTERN AMERICAN TRILLIUMS PART I**

**FREDERICK W. CASE, JR.**  
Saginaw, Michigan  
Photographs by the author.

Trilliums are among the most familiar and beloved of the early spring flowers of the eastern United States. Some enjoy great popularity for their quiet beauty and grace. Some others, especially among the sessile types, cannot be said to be "beautiful". Rather, one might say they possess "curious, gnome-like, fantastic", or even "amusing" characteristics. The folk-names of many species indicate the place they hold in the lore and lives of all of us: Wood Lily, Mayflower, Stinking Benjamin, Wet-dog Trillium, Bloody Noses, and Wake Robin.

As a genus (or as a distinct family as

some botanists believe), trilliums range widely across North America and Asia. By far the greatest number of taxa occur in the mountains, upper piedmont, and foothills of the southeastern United States, from the Carolinas to Alabama, and on the Cumberland Plateau and surrounding areas of Kentucky and Tennessee. Additional species range northward along the Appalachians into Canada, Newfoundland and westward in the north to the edges of the prairies in Minnesota, Nebraska and Iowa. Farther south, a few species occur in Missouri, Arkansas, Mississippi and Louisiana. One or two species

reach Texas.

In the western United States, there are at least two pedunculate and four or five sessile trilliums, mainly near the West Coast.

Trillium species occur in Asia as well. There, they range from Russia and the Himalayan Mountains to Japan and Kamchatka.

A relative of *Trillium*, *Paris*, occurs in Europe and Asia. Vegetatively, species resemble, somewhat, the bunchberry, *Cornus canadensis*, while the greenish flowers are fascinating, but certainly not showy. Indian Cucumber-root, *Medeola virginica*, is another relative, unshowy yet interesting and widespread in acid woods of the eastern states.

## TAXONOMY

Taxonomically *Trillium* has been poorly understood in the past. The literature, both botanical and horticultural, contains a morass of misnomers, incorrect distributions, and general misinformation. So confused is the situation that few can speak and be absolutely certain that they refer to a given taxon as its author intended. The confusion results from a multitude of factors. The species often possess rather minute structural differences which tend to be obliterated or obscured in dried herbarium material. Trillium seedlings often flower while they are still much smaller than plants typical of that species. Several species seem to mutate frequently and have produced a variety of color forms. A few species hybridize freely with closely related species when they occur together. Some of the hybrids, especially when one of the parents is a color mutant, may mimic color patterns of other species.

Fortunately, studies are under way in several American and Japanese universities which could erase much of the confusion. Tools of taxonomic analysis today utilize refined chromosomal and biochemical techniques which can throw

much light on relationships.

A fine revision of the sessile trilliums by John Freeman (1975) is the most definitive and helpful paper on sessile trilliums yet to appear. I will generally follow his treatment.

It is not my purpose, in any sense, to write a taxonomic paper here. Rather, I intend to discuss the eastern species of trillium from the point of view of my own field experience and from growing them in the garden.

The genus *Trillium* consists of two subgenera, *Trillium* subgenus *Phyllanthum*, the sessile trilliums, in which the flower is borne directly upon the bracts (leaves), and *Trillium* subgenus *Trillium*, the pedunculate trilliums, in which the flower is borne on a short stalk, the peduncle, above the leaves.

## THE PEDUNCULATE TRILLIUMS

The pedunculate trilliums, currently under study by several researchers, greatly need revision. My interpretations and field experiences do not seem to agree fully with the works presently in print.

The pedunculate trilliums are particularly useful and showy in the garden. All work extremely well in the woodland and wild garden. Let me first list those pedunculate species which I believe to be fairly distinctive wild populations, if not taxonomically discreet species. Then I will discuss each taxon from the point of view of occurrence, culture and ecology, as follows:

### Eastern Pedunculate Species

- T. catesbyi*
- T. cernuum* var. *macranthrum*
- T. erectum*
- T. erectum*, forma *blandum*
- T. flexipes*
- T. grandiflorum*
- T. nivale*
- T. ozarkanum*
- T. pusillum* var. *pusillum*
- T. pusillum* var. *virginianum*

*T. persistans*  
*T. rugellii*  
*T. simile*  
*T. texanum*  
*T. undulatum*  
*T. vaseyi*

### ***Trillium catesbyi* Ell.**

Catesby's Trillium occurs in the southern Appalachian and Great Smoky Mountain areas, from the upper piedmont of Alabama and Georgia, along the mountains into Tennessee and North Carolina. It is one of the so-called "nodding trilliums", that is, the peduncle recurves below the foliage. Fortunately the leaves are relatively narrow in this species so that the flower displays well.

*T. catesbyi* usually grows about twelve to fifteen inches high, with the leaves held upward well above the flower. The leaves frequently fold somewhat upon the midrib into a boat-shape, with the veins well engraved into the surface. The leaves are dark maroonish green when young. The relatively large flowers, up to two inches across bear strongly reflexed petals, either narrow or wide, which range in color from purest white to a deep rich rose-purple. The very large stamens are bright yellow and strongly recurved, the ovary six angled. In the wild the plants seldom form clumps, instead they grow singly or in loose, open associations of a few plants.

Catesby's Trillium grows most frequently in rather open, well lighted woodlands of a fairly dryish nature, often where the soil is strongly acid. It is frequent in "laurel slicks", those jungle-like entanglements of *Rhododendron maximum* and *Kalmia latifolia* on steep hillsides in the Appalachian mountains. In deep shade it often fails to bloom.

The finest forms from the gardener's standpoint, which I have seen, occur in mountain valleys on the North Carolina-South Carolina border. Here, on flats along small mountain streams, occur deep rose forms with broad petals, truly lovely.



*Trillium catesbyi*

(See my color photo of one of these forms in: Crockett, J., Allen, O., and Editors of Time-Life Books, *Wildflower Gardening*, *The Time Life Encyclopedia of Gardening*, Time-Life Books, Alexandria, Virginia, 1977.)

For me, *T. catesbyi* grows readily. I grow it in neutral to acid sandy soil, which is moist in spring but rather dry in late summer. It receives considerable light at least for several hours each day. Seedlings of the white forms appear in bare spots in my garden but the form which opens deep rose has not appeared here from seed as yet.

Small enough for a background spot in the rock garden and ideal for the acid woodland or rhododendron bed, this early to mid-season species merits a place in all well maintained natural gardens. Appalachian region wildflower nurseries sell the species.

### ***Trillium cernuum* L.**

The Nodding Trillium is one of the trilliums not fully understood by most. Indeed, there appear to be at least two en-

tities masquerading under the name *T. cernuum*. In the North, the plant usually known as *T. cernuum* var. *macranthum* Wieg. is a fairly distinctive plant. It is tall, up to twenty-four inches, although averaging about fifteen to eighteen inches, with rhombic leaves forming a nearly closed umbrella over the stem. The flower nods on a peduncle which deflexes at its base so that the flower hangs below the leaves. The peduncle, however, is fairly straight over most of its length. The leaves obscure the flower. Petals are thin textured, narrow, strongly recurved. The delicately built, lavender purple stamens divide about equally into filament and anther sac. The ripened ovary, a large, six-angled pyramidal red berry is showy, juicy, and fruity aromatic. Since the leaves elevate during the ripening period, the fruit is better displayed than the flower.

Nodding Trillium prefers cool moist soils. It grows often in low alder thickets along trout streams, or on cedar swamp borders or in low damp spots in deciduous forests of beech and maple. It seldom abounds in any one location, yet it is not particularly rare within its range.

As a garden plant, it is not easy, nor is it showy or distinctive horticulturally. It is difficult in warm soils; some forms are too tall for the rock garden, and in most forms the flowers are decidedly inconspicuous because they are obscured by the large leaves. For those whose passions run to collections of species, it is worth having, but its tallness, miffiness, and lack of showy flowers relegate it to a strictly third class place among garden worthy trilliums in my opinion.

*T. cernuum* var. *macranthum* occurs from Newfoundland to Manitoba across the north, then southward into Illinois and Indiana. Southward, along the Appalachians, its range is less clear, perhaps because of the confusion of this with other species or forms.

In the Blue Ridge and Great Smoky Mountains, the plant called *T. cernuum* by botanists, gardeners, and nurserymen differs considerably from our northern plant. It has been called *T. rugelii* by earlier botanists and acceptance of this taxon as a valid species seems to be coming back into favor. Along the Black Warrior River in Alabama, and in the Appalachian foothills in Georgia, I have, however, seen plants which seem nearly identical with our northern var. *macranthum*.

### *Trillium rugelii* Rendel

Rugel's Trillium, included by some within the *T. cernuum* concept, differs from northern *T. cernuum* in its much shorter more reflexed peduncle, heavier textured, creamy white broad petals, and large, thicker and very dark maroon purple anthers. The fruit is considerably smaller and darker red when ripe than *T. cernuum* in Michigan.

*T. rugelii* is a vigorous plant in most forms, with large, rhombic leaves on a fifteen to twenty-four inch plant. Flowers last long compared to those of *T. cernuum* var. *macranthum*. *T. rugelii* occurs from northern Georgia through Smoky Mountain National Park and in the Blue Ridge Mountains of North Carolina. Johnson (1969) reports it also from Tennessee and Alabama.

In the several locations where we have observed it, it grew in very rich woods on slightly acid to neutral soils, either along flats of small streams, or on steep rich slopes just above the flood plain soils. It is easy of cultivation, but the short, curved peduncle carries the flowers well hidden below the leaves, which limits the usefulness of this species to the garden.

In several locations where we found the plant growing with *T. vaseyi*, hybrid swarms occurred. Color forms varied greatly with dark maroon, pink, rose, and rose and white flecked types present. Unfortunately, these hybrids, with really



*Trillium rugellii*

lovely flowers, produce them so obscured on their short recurved peduncles that they are rendered almost useless as garden subjects.

Current studies will almost certainly throw new light on the nature of *T. rugellii*. I consider it a valid species.

Plants listed as *T. cernuum* by Appalachian wildflower dealers will likely prove to be a mixed bag and include plants of *T. rugellii*.

### ***Trillium erectum* L.**

This species, perhaps the most widely distributed of our eastern pedunculate trilliums, is my unabashed favorite. Not that it is the showiest species, rather, in Michigan, no plant ever gave me a greater chase when I was a kid trying to locate it. None has ever given me greater pleasure with its early flowering, rich coloring, its fetid yet nostalgically pleasant faint stench, and its penchant for mutating, producing showy and desirable color forms.

The Wake Robin occurs from the uplands of Georgia to Maine and Quebec. In the acid soil regions along the entire Ap-

palachian chain and in the woodlands of glaciated New England, and eastern Ontario, it often abounds. Westward, in Michigan and Ohio, where acidic rocks and soils are less abundant, the plant, too, is relatively local or rare. Although reported from Minnesota, Wisconsin, and Illinois, the only authenticated stations there suggest that the plants have escaped from gardens or arboreta.

*T. erectum* is often confused with the closely related *T. flexipes* forma *walpolei*, a red hybrid segregate of this species.

Typically, *T. erectum* is a medium tall plant, from twelve to twenty inches, but not so tall in relation to leaf size as *T. cernuum*. The leaves are very large, broadly rhombic, and rich apple green. Flowers may be borne stiffly erect on their peduncles, or more often leaning to one side, sometimes almost declined. Obviously, large, colorful, erect forms are the most desirable horticulturally. Local races vary. Petals — in the typical forms a dark red-maroon — fade with age to a more purple color. They are longer than broad and sharply pointed and slightly cupped forward. Forms with ovate, broad petals occur as do very flat flowers. Although some of these types have been given subspecies names recently, many grow in mixed populations with *T. flexipes*. I am convinced that these forms represent hybrids and hybrid swarms as these forms are duplicated in lower Michigan where the two species intermingle. We have also produced some of the same kinds of color and structure forms from controlled crosses in our garden.

More than one gene, apparently, control the color of what is to the eye a solid dark maroon-red petal in *T. erectum*. Consequently, mutations occur involving deletions of certain but not all of the color genes. The result may be a petal with a dark base and lighter distal portions, or the reverse, a white base but darker extremities. Multiple deletion mutations

produce white petals or pale yellow or green ones.

When these color forms hybridize and various combinations occur, beautiful, bizarre, and surprising color patterns result. Nearly all are desirable horticulturally. These forms should not be confused with the variegated and monstrous forms produced in *T. grandiflorum* by mycoplasma pathogens; they are quite unlike those.



*Trillium erectum* f. *blandum*

Besides the mutant color forms which can occur in any population of *T. erectum* anywhere, certain color races seem to dominate in certain districts. In parts of the higher elevations of the southern Blue Ridge Mountains, a form with narrow white to greenish white petals abounds. The contrasting dark maroon-black ovary contrasts showily. This form is otherwise typical *erectum* in petal shape, plant aspect, and odor.

*T. erectum* flowers may last for two weeks in cool weather. When fresh, they emit the fetid odor of wet dog. Mercifully, the odor cannot be detected more than a few inches from the blossom. The fruit of typical *erectum* is distinctive. The ripe berry is quite spherical, with six shallow ridges, crowned with the three short stigma tips and the entire structure is a shiny dark maroon or blackish maroon color.

Compared to the ripe fruits of *T. cernuum* or *T. flexipes*, the berry is quite small.

Red Trillium grows in both evergreen and deciduous woods on light humus rich soils, or in the rich, drier peaty soil of old cedar-hemlock swamps (at least in Michigan). Soil reactions are mildly acid. The soil is generally cool in summer.

As a garden plant it is easy, except in poorly drained clays. It is large for the rock garden, but ideal for woodland settings or as a background plant near a shrub. In my garden it seeds and hybridizes abundantly.

### *Trillium erectum* forma *blandum*

On the west side of the Great Smoky Mountain National Park, in the general vicinity of Gatlinburg, Tenn., grows a plant which I formerly had interpreted to be *T. simile*, but which I have been informed by a student of the group, should be called *T. erectum* var. *blandum*. This taxon, present as the lower elevation representative there of the *erectum* complex, is truly a fine horticultural subject. Its general aspect suggests a vigorous *T. erectum*. The plant produces very large, oval petaled, heavy textured creamy white flowers, each with a dark maroon-black ovary. The faintly musty scented flowers stand strongly erect and appear nearly as showy as those of *T. grandiflorum*. Petals remain in good condition for a long two weeks.

The plant is not identical with the ordinary white-flowered forms of *T. erectum* and is vastly superior in size, color, and texture horticulturally. It has proven to be a good garden plant for me in cold central Michigan although our climate is far more severe than that of Tennessee. Bloom size increases as plants become established and strong clumps develop. I would regard this plant as one of the best of the larger pedunculate trilliums for garden use.

Forma *blandum* is one of those poorly



understood entities that has been much confused with others in the past, and on which there is much current study. Regardless of the outcome of taxonomic research; the form is superb. It forms very large colonies where it occurs, often cascading down a wet roadside outcropping and nearby talus in hundreds of plants.

I do not know the extent of its range, but it appears to be the only form of *T. erectum* within some distance of Gatlinburg at the lower elevations. The plant is illustrated as *T. simile* in the Time-Life book previously cited. (ibid.)

### *Trillium vaseyi* Harbison

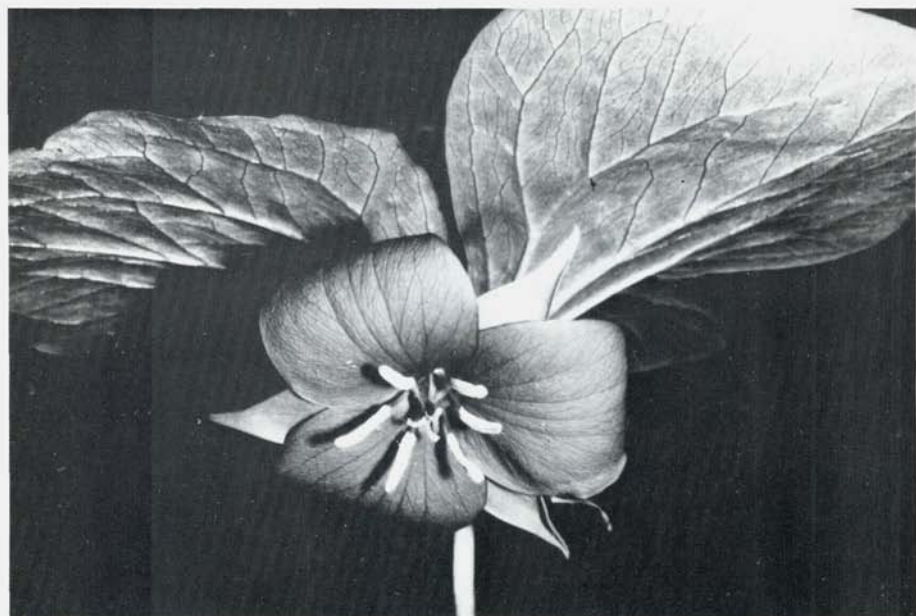
Some botanists consider *T. vaseyi* to be but a variety of *T. erectum*. I disagree with them on the basis of both taxonomic characters and field ecology, although I acknowledge that the two species are very closely related. Regardless of taxonomic differences of opinion, the plant is certainly distinct horticulturally.

*T. vaseyi* is a very large, late blooming

plant. It stands from fourteen to over twenty-four inches high and has flowers that can be easily the largest of any eastern trillium. The deep maroon-red, faintly pleasantly scented blossoms appear after most of the other species have finished flowering. They reflex on the peduncle so as to be partially hidden beneath the leaves. The blossom, often over four inches in diameter, opens flat with recurved petal tips. Compared to many of the forms of *T. erectum*, the flowers last longer and open later in the season. The umbrella of leaves sometimes measures over fifteen inches across.

The plant is impressive to see and makes an excellent accent plant in the garden.

In the wild its preferred habitat is in the "coves" — small side valley amphitheaters eroded into soft rocks by the smaller tributary streams — mainly of the south and southeastern edges of the Smoky Mountain and Blue Ridge Mountains. Rocky ledges and platforms near



*Trillium vaseyi*

trickles in humus-rich mucky damp soils suit it best.

In our severe climate, this is not an easy plant. Although it does not perish from winter conditions, it is difficult for me to provide the wind protection and moisture it prefers as it develops in spring. Yet it always blooms even if the leaves and flower show slight damage.

Under favorable conditions it is a superb garden subject although it seems rarely to be cultivated outside its native areas. It is illustrated also in color in the Time-Life book, *Wildflower Gardening*. (ibid.) According to the literature, white forms and hose-in-hose double forms occur. I have not seen them.

### *Trillium simile*

From currently published works, I have been unable to ascertain to what plant this name correctly applies. Plants I have found or been shown by other field workers have proven to be *T. flexipes*, *T. rugelii*, or *T. erectum* f. *blandum*. Robert



*Trillium flexipes*

G. Johnson, in his Ph.D. dissertation, considered it to be the albino form of *T. vaseyi*. If the name is valid, its use awaits a clearer scientific delineation of the taxon to which it should apply.

### *Trillium flexipes* Raf.

Known also as *T. declinatum*, and *T. gleasonii*, this much misunderstood plant is really quite distinctive and, in its best forms, a most useful horticultural subject. The plant is a large one, up to thirty inches tall when growing in rich soil. Flowers, borne on three to five inch peduncles, may be stiffly erect or declined at various angles below the large, rhombic leaves. Petal texture is usually quite leathery, making the blooms of the best forms long lasting. The three inch flower may be quite flat with rather broad, ovate petals or the petals may be narrow and reflex badly, with curled margins on a recurved peduncle. The finest forms for garden use which I have seen come from the limestone country near Louisville, Kentucky, where the species is abundant.

Flowers of good forms last for up to three weeks or more in cool weather, making it the longest lasting pedunculate trillium in the garden. The pyramidal fruits, as large as crabapples, rich pink-rose in color and strongly six angled, emit a fruity fragrance.

*T. flexipes*, as currently understood, ranges in the American midlands from northern Alabama to Wisconsin and Minnesota, thence eastward into New York and Maryland. In the driftless areas of Wisconsin and Minnesota I have seen plants which appeared to be intergrades with *T. cernuum* var. *macranthum*.

Where the range of this species overlaps that of the red flowered *T. erectum*, and where acid and limestone soils occur in proximity, extensive hybridization occurs between these species. Some of the hybrid patterns occur so frequently that they were first considered to be distinct

forms and were named *T. flexipes* f. *walpolei* and *T. flexipes* f. *billingtonii* Farwell.

Where suitable conditions occur, in Michigan, Ohio, and Kentucky, large hybrid swarms and their backcrosses produce a delightful array of plants. Flowers in a variety of maroons, rose, speckled, spotted, and shaded colors abound. Because, as mentioned, there are multiple genes influencing the various parts of the petals, hybrids appear which are white basally with distally red petals, or the reverse, mimicking the Painted Trillium. In my garden, wholly new color variations have appeared. Through controlled pollination, my wife and I have produced garden hybrids identical in color patterns with some of the wild forms. When we crossed the large, heavy textured erect flowered types of *T. flexipes* from Kentucky with *T. erectum*, superior, erect flowered forms with excellent carriage and color resulted. Even picotee forms — cream, margined with purple flecks — have appeared. These hybrids merit a place in the garden. We are trying to find ways to propagate these desirable types more rapidly.

### ***Trillium grandiflorum* (Michx.)**

#### **Salisb.**

This magnificent species is the best known and best loved of the trilliums and is indeed a favorite spring flower of all outdoorsmen in the Northeast. In cultivation, it can be as large as any species and is always truly showy. Great masses of this plant fill the woodlands of the Great Lakes Region, Ontario, and parts of New England in the spring. It ranges southward in upland regions of the Cumberland Plateau and Appalachians to North Carolina and Tennessee, but becomes local southward. The species occurs in all but the waterlogged soils of bogs and floodplains, but thrives best on sandy or loamy hillsides.

Standing eight to over twenty inches tall, with leaves up to eight inches long and less rhombic than in the *erectum* complex, the plant bears a relatively large flower on a three inch peduncle. The flowers are more deeply cupped than in many pedunculate species, almost funnelform at their bases, but widely spreading at their distal ends. Petals, each up to three inches long and half as broad, are thin-textured but very white with deep and conspicuous veins. In spite of the thin texture, the petals last long and gradually turn from white to pink to deep rose with age. The fruit is six angled, green and inconspicuous.

*T. grandiflorum* is larger and in every way showier than its western counterpart *T. ovatum*. It has also the advantage of being far more winterhardy.

In European gardens, the plant is grown with considerable light and fertilizer; with such a treatment very large plants develop. There is no doubt that this is the one best species for massing and landscape effect in the woodland garden. It is a long lived, clump forming species.

Like other species, it has various forms. Various hose-in-hose double types occur, and rock gardeners know of the magnificent form with about thirty petals. Double forms have appeared many times in the wild and both highly symmetrical, lovely forms and rather ragged petaled doubles exist.

There is a form in which the backs of the petals are pink, even in the bud which has been reported and is coveted. I have been fortunate not only in obtaining such forms from horticulture, but in finding my own very good pink-backed form in southern Michigan. Seedlings of these are appearing in my woodland garden with better color than in the wild forms. I have not, however, found a form in which the face of the petal opens in a good pink. Such a form would be a real find!

In recent years a vogue has developed

in rock gardening and other horticultural circles for local forms of *T. grandiflorum* which occur with green-striped petals, blotches, or other aberrations which include alteration of the plant body form itself: clusters of leaves replacing the flower, or a knot of petals, white and green streaked, without leaves, or very commonly, long, narrow petiolate leaves — sometimes several sets of such — and highly distorted flowers. I have seen one such in which there were long petioled leaves at ground level, a long stalk bearing a much variegated and distorted flower, with miniature three petaled but distorted blooms emerging from the stamen tips. Earlier botanists considered these strange plants as "mutations", or teratological forms. Some gardeners have spent a goodly sum trying to obtain as many of these as possible. Although some are beautiful, they result from a disease. Dr. Gary Hooper, Michigan State University, and myself (Hooper, Case, et. al. 1971) have demonstrated that the condition originates not

from mutation, but from the presence in the tissues of mycoplasma organisms. These organisms, larger than viruses, seem capable of producing on developing tissues an influence similar to that of genes. The infection spreads slowly in wild populations until entire colonies show the disease symptoms. Infected plants turn maroon-red months early and die down. Weakened plants gradually disappear in wild colonies.

This mycoplasma disease can spread to other species: we have seen it in *T. erectum* and *T. undulatum*. However unfortunate it may be that gardeners have invested considerable sums for these showy but diseased plants, no sensible gardener ought to harbor them. Certainly, diseased clones ought not to be spread around the world under the guise of horticultural forms.

### *Trillium persistans* Duncan

In 1971, Duncan described a new trillium from the mountains of northeast Georgia. Known thus far only from a four mile square area in which the plant is rare, local, and difficult to approach even in sites where it is present (because of TVA damming of rivers), this plant has been given endangered status under federal laws.

A distinctive, small trillium, the plant has lanceolate, somewhat drooping leaves with three conspicuous large, light colored veins per leaflet. The flower resembles somewhat a depauperate first blooming seedling of *T. grandiflorum* or *T. catesbyi* and is distinguished by the failure of the petals to spread very widely at first. The blossom diameter is about one to one and a half inches, the petals individually quite narrow, somewhat undulate. The small, flattened ovary is strongly six-ribbed. As the flower ages, the distal portion gradually deepens to a dark rose purple. The proximal area near its attachment retains its white coloration



*Trillium persistans*

in the form of an inverted V. This color pattern of the aging flower is diagnostic for this species.

Plants as rare as this species should not be collected any longer by amateur botanists or gardeners. Since there will always be avid collectors and plantmen who "must have the plant at any cost", it is my personal view that seeds of this and other extremely rare species should be raised by botanical gardens or university gardens, and that cultivated material ought to be introduced into the horticultural trade at the earliest possible moment. This, I think, would provide a source of plants for the specialist-collector-grower, but would not put pressure on wild populations through illicit collecting.

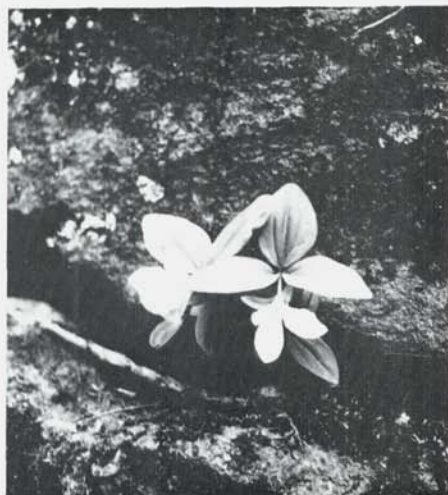
The specific epithet "*persistans*" refers to the long lasting nature of the plant, which remains healthy and green until late in the autumn. Persistent Trillium is also one of the earliest of the trilliums to appear, blooming in February and March (into early April) in its wild haunts. Through a quirk of fate, I collected three plants of this species with some *T. catesbyi* near the type locality some years before the plant was even described. They are fully hardy at Saginaw, Michigan, but its seeds have not produced seedlings.

As a garden subject, I would rate the species as second class, although in size it is a good plant for the rock garden. *T. persistans* was honored with a painting on the U.S. Endangered Species Postal Stamp series.

### ***Trillium nivale* Riddell**

If I could choose but one pedunculate trillium for the rock garden, I would not hesitate to choose the Snow Trillium. Firstly, one of its preferred habitats is on limestone outcrops and the talus slopes below. It is thus a true rock plant. Secondly, it is tiny, like many of the best rock plants, but with large and conspicuous

flowers for its size. Thirdly, it is the earliest wildflower to bloom in our region, often commencing bloom ahead of the Skunk Cabbage which is traditionally considered our earliest wildflower.



*Trillium nivale*

*T. nivale* grows mainly on limestone soils and outcrops, or secondarily, on rich, limy river bank soils in a narrow band from western Pennsylvania through Ohio and Indiana to Iowa and southern Minnesota. It is rare and local over much of its range, but is said to be abundant in parts of its western distribution, even persisting in fencerows after the woods have been lumbered.

At first only two or three inches tall, the plant enlarges in bloom, (as does its relative the Painted Trillium) and may in vigorous plants attain a height of six inches. Blooms, surprisingly large and showy for the size of the plant, are usually a clean white with conspicuous yellow stamens. Blossom spread is up to two inches. The ovary, six-angled in most trilliums of this group, is instead obtusely triangular in cross section. The two to three inch long, ovate leaves are a glaucous bluish green and distinctly petiolate. The peduncle,

erect in flower, reflexes strongly as the flower ages, and is strongly reflexed before the petals deteriorate.

Because Snow Trillium blooms from early March into April, it frequently is subjected to very cold night temperatures. The plant often freezes solid, in bloom, night after night without apparent harm.

The Snow Trillium requires a site free of competition. It inhabits eroding limestone ledges, ravine summits where continued erosion keeps sunny areas free of grass, or loamy flood plain soils where only occasional flooding prevents development of dense woodland vegetation. For it to be permanent in the garden, one must simulate the competition factors of the plant's wild habitat. Give it a slightly open, flat area, mulched with lime chips, a crevice in a limestone boulder, or a spot free of plants at its base. Under these conditions, the Snow Trillium can be one of the best of the American rock plants, long lived, and freely seeding about.

We had the pleasure, this year, after a forty year search, to be a part of the rediscovery of *T. nivale* in abundance in Michigan. The plant had been considered extinct here.

#### ***Trillium pusillum* Michaux var.**

In Coastal Plain, Piedmont, and southern Cumberland Plateau woods from Maryland and Virginia to Alabama and Kentucky grow several taxa of charming dwarf trilliums which are all very rare, local, and largely unknown to gardeners. Many of these populations may now or soon have legal protection as threatened or endangered species owing to their discontinuous and very local occurrences. It would be my hope, however, that these taxa could be legally brought into cultivation and made available commercially, for they have traits that make them ideal subjects for the rock garden.

*Trillium pusillum* grows more stiffly

erect than *T. nivale*, averaging just slightly larger, from about four to eight inches tall. The somewhat drooping, narrowly oval, blunt-tipped leaves are green to bluish or maroon green. The flower is quite large for the plant, upfacing, white, or white on the face with a rose back to the petal. Blossoms reach to over two inches across, spread widely, and have very undulate petals.

Races of *T. pusillum* bloom just after *T. nivale*, early in the season, and well ahead of most other trillium species. Thus, they fill a need in the garden schedule. Flowers persist a long time. Since, like *T. grandiflorum*, they gradually turn rose, they also provide a touch of color before they fade.

*T. pusillum* grows in generally acid-soil swamps and stream bottomlands, in soggy soils at the upper limits of the floodwater level, and occasionally, in upland swamps. Where colonies occur, plants are generally abundant.

In my garden, it grows and blooms well without the moisture of its native habi-



*Trillium pusillum* var. *virginianum*



*Trillium ozarkianum*

tats. So far, at least, it has been completely winter hardy. For "purists" it is not a rock plant in any sense. But in size and charm, it is perfectly suited for a featured spot in a rockery. It grows well in a neutral to slightly acid pocket of not too fertile soil.

The discontinuous distribution of *T. pusillum* with lack of gene-flow between populations for a long time has led to structural differences among colonies. Most of these are minor, but plants from the north of its range in northern North Carolina, Virginia and Maryland have been given varietal status as *t. pusillum* var. *virginianum* Fernald.

In this variety, the flower peduncle is either vestigial or absent, the flowers sessile or subsessile. These blooms face stiffly upward giving the plant a different aspect from any other pedunculate trillium. This carriage, coupled with the usually rose backing to the petals and the smaller

size of the plant, make it completely charming and horticulturally desirable. It is, however, a very rare and local plant. Like other rare species, arboreta or botanical gardens ought to propagate and distribute the plant to dealers so that it may be legally and safely available to gardeners.

### *Trillium ozarkianum*

#### Palmer and Steyermark

Botanists formerly considered the Ozark Trillium to be a variety of *T. pusillum* but now generally give it specific rank. It differs from *T. pusillum* in being taller, up to ten inches or so, with more ovate pointed leaves, which have generally five prominent veins instead of three as in *T. pusillum*. Early in the bloom period, the leaves also tend to have a deep maroon undertone largely absent from typical *T. pusillum*. Flowers, on strong peduncles, average larger than those of *pusillum*, with distinctly wavy-undulate margins and very conspicuous recurved yellow stamens. Bloom time in my garden is just reaching its peak as *T. pusillum* varieties fade.

*T. ozarkianum* habitat differs from that of *T. pusillum*. It grows on rocky hillsides, in open fields, open oak or mixed deciduous forest-pine woods, or in shaley, rocky, dry stream beds. It occurs in the Ozark Mountains of Arkansas and Missouri, and in Kentucky, often in areas where grow mountain laurel, arbutus, sourwood trees and other acid soil plants. Plant collectors and wildflower nurseries of the Ozark region occasionally offer it. Its size and manner make it highly desirable for the rock garden.

Ozark Trillium grows well for me at Saginaw, Michigan and is one of my favorite plants. It is completely winter hardy. It has not seeded about here as have many other species.

### *Trillium texanum*

Texas Trillium was also formerly united with *T. pusillum* by most botanists and



*Trillium texanum*

is clearly a close relative. It is the only eastern trillium which I have not seen in the wild, although I have seen the plant in John Lambert's Mountain Fork River Arboretum at Mena, Arkansas. In general aspect it resembles *T. pusillum* but is narrower in all respects. The almost linear petals are undulate, clear white, and spreading. The narrowly linear leaves, blunt-tipped and green, spread rather than droop as in *pusillum*, and tend to fold or reflex toward each other across the upper surface, giving the leaves a slight "boat" shape.

Native to the coastal plain, wetter regions of east Texas, this trillium grows in acid woods and boggy ground, often in company with *osmunda* ferns. It, like other relatives of *T. pusillum*, represents local, disjunct variants of a once uniform and widespread species. If it proves to be winter hardy here, it will be a worthy garden subject as a variation on a theme.

#### ***Trillium undulatum* Willd.**

The Painted Trillium can be the beauty of the genus, or it can be disappointing.

This apparent paradox stems from the manner of development. *T. undulatum* plants emerge from the ground relatively late in the season and develop rapidly. Buds open when the plant scarcely has grown four inches tall. Growth and expansion continue for several more days until the plant reaches full size, a height of from fifteen to twenty-four inches. At this time, the full blown flower may be three inches across, with thin-textured, white petals beautifully blotched and penciled with deep red at the base. If plant development has proceeded as above, the plant is a great beauty. But, if the flowers be pollinated before expansion is complete, a hormone reaction occurs, the petals turn watery and translucent, the colors fade rapidly, and the petals wither and fall. A prematurely pollinated plant disappoints, to say the least.

Wide ranging, the Painted Trillium occurs from Quebec and central Ontario southward in acid soil regions to the mountain tops of the Great Smoky Mountains and the Blue Ridge of the Carolinas and Georgia.

It requires cool soils, hence its restriction to higher elevations southward. In New England, the plant is widespread at



*Trillium undulatum*



most elevations in suitable acid soils. Westward, the species reaches into the "Thumb" of lower Michigan, where it is a very rare, protected plant. Reports from north and west of these Michigan stations lack specimen documentation and at least some of them result from misidentifications of the *T. erectum* x *T. flexipes* hybrid segregates having basally red-blotched petals. See *T. flexipes* f. *billingtonii* Farwell, discussion in Case and Burrows, 1960.

Growing this demanding species can be difficult if one lives and gardens outside its natural areas of occurrence. Not only must it have suitably cool temperatures and pH, but it nearly always grows in deep brown peaty forest duff.

Although Painted Trillium is not native in my immediate area, I have grown it for years in the deep shade under beeches and oaks by excavating a large area to a depth of about ten inches. On the bottom of the excavation I place about three inches of washed silica sand (which can be

purchased at builder's supply houses as sandblaster's sand). On this sand I place the trillium rhizomes, for in the wild, in Michigan and in North Carolina, they invariably grow with the rhizome in contact with mineral soil but deeply covered with acid duff. Over the rhizomes I place a mixture of sand, Canadian peat and oak and pine duff, bringing the mix up to the level of the surrounding soil. This *shaded bed* should then be mulched with oak leaves or pine needles.

Wildflower dealers offer this species. It is worth a try, but I am uncertain as to how it will perform in the hotter American midlands.

When current research is completed, other pedunculate trilliums may be recognized. Nomenclature may change, but the *wild populations* I have referred to are distinct from the horticulturalist's point of view, and these plants deserve a place in the world's gardens if it can be done without endangering wild populations.

(First Part of two part article)



The pursuit of rock gardening is as complex as an expedition of a hundred people climbing a mountain in a day. As they arrive from different places, some early, some late, each sees the mountain ahead in a different light.

Each person chooses a path by which to ascend or makes his own, cross-country. A few are content to stay at the lower altitudes, circling the mountain or meandering over a single meadow. Some will run to the top without pause, only later returning to examine what they previously passed. Others slowly and methodically ascend, not caring if they reach the summit as they carefully search the ground for treasures. Still others station themselves near obstacles and help less stalwart hikers to climb, though never reaching the top themselves.

But at the end of the day all must descend. Each can say he knows a part of the mountain yet *no one* knows the whole. There is plenty of room on the mountain for all — and no right or wrong way to ascend. Won't you come climbing with us?

— Betty Ann Mech

# HUNTING FOR DWARF CONIFERS

GORDON BENTHAM

Victoria, British Columbia

Did you know that the history of *Metasequoia glyptostroboides* (Dawn Redwood) goes back 100 million years? It was thought extinct as it had only been known in fossilized form, but was discovered growing in China in 1946. It was then introduced into the United States, propagated and soon afterwards distributed all over the world. This conifer has no dwarf forms that I know of, but as a very enthusiastic collector I am certainly on the lookout for one.

Collecting dwarf conifers means different things to different people. Some enjoy walking through forests or up mountains looking for seedlings that appear stunted or seeking the abnormal growths on the branches of conifers called "witch's brooms" from which a great number of our dwarf forms originate. Others enjoy going to nurseries and going through the beds of seedlings for slower growing forms or for plants with a branch showing an abnormal color or one with a variant rate of growth. All of these, however, do not produce new named cultivars; after propagating them and growing them on for a few years, most will prove not worth naming as they are of insufficient merit or not distinctly different from existing cultivars.

My own collecting started almost accidentally. Although I have always liked dwarf conifers, I did not become really interested in them until I went to a nursery that specialized in the more rare and unusual forms in order to buy a few for my garden. The owner was an enthusiast with the ability and knowledge to notice differences in color and growth habit in the many plants that went through the nursery every year. Consequently he was re-

sponsible for many originations that are now known all over the world. One example is *Chamaecyparis pisifera* 'Filifera Sungold'. It had been selected out of a bed of five hundred *Cham. p.* 'Filifera Aurea Nana' because it did not burn in the sun as 'Aurea Nana' is prone to do. The original plant is still growing at the nursery and over the years it has proven far superior to 'Aurea Nana'.

I started going to the nursery to visit and soon was collecting the different species and forms as they became available. The owner took an interest in me and gave me the benefit of his experience and knowledge. He also lent me books on the subject: *Dwarf Conifers* by H. J. Welch and *Manual of Cultivated Conifers* by Den Ouden and Boom. I later bought both of these and together with Hillier's *Manual of Trees and Shrubs and Ornamental Conifers* by Charles R. Harrison they form the most important part of my reference library on this subject.

I like dwarf conifers because they do not take up as much room as the larger growers and, as their root systems are smaller, they can be kept in pots for many years. These pots I keep plunged in sand just above their rims, which protects both clay pots and plants from frost in winter and makes watering much easier. They also can easily be lifted for display at garden shows and exhibitions. I examine them each spring and repot the ones that are in need of it. Dwarf conifers look very nice all year around and, with their different colors and growing habits, can form the backbone of any garden.

I find a definite challenge in locating and finally obtaining a certain cultivar after reading about it. It took me several

years to obtain *Cedrus deodara* 'Pygmaea'. I finally located it in New York and it was worth the long search. I correspond with a number of nurseries and collectors in many countries and am always on the lookout for new addresses where I might find a new friend. Nearly every catalog and list I see contains something I would like to obtain and I am more than willing to buy or trade for these.

My own list offers something for most collectors as I live in a very mild climate and so am able to grow a wide variety of different species. My letters usually result in trading and lasting friendships. All the cultivars are not available at the same time, so I am constantly writing both about the cultivars I am trying to obtain and the new additions to my own collection.

When I travel to the United States or to Europe on my vacations I take my hobby with me. True, the plants stay at home, but I have the pleasure of meeting the people I have been trading with, visiting them, taking pictures of their collections and bringing back new introductions for

my own collection. As a large number of these are new to our locality and sometimes even to our country, I feel it is my responsibility to make them available to friends, botanical gardens, universities and to the nursery trade if they are interested.

I happen to live on Vancouver Island off the coast of British Columbia in Canada in a very fortunate climate, but even those who live in very hot or cold climates can find varieties that will grow well for them. It is surprising what you can find if you only take the trouble to look. You may find new cultivars that originate right in your own city. Many nurseries propagate their own originations just for the local trade and do not even bother to name them.

If you would like to start collecting or if you would like more information write me: Gordon Bentham, 3272 Wicklow St., Victoria, B.C. V8X 1C9, Canada. Better still, write and tell me what you have; among them may be my favorite conifer. Speaking as a collector, my favorite conifer is always the one I have yet to obtain.

## The Rock Gardener on the Couch

"Dr. Blumenstein, I don't know what to do. My plumbago is spreading, I'm sure I've got pulmonaria, and my horminums are acting up. I can't get my son, Boykin James, to do anything — he just sits in the woods, dreaming. And my Daphne, such a beautiful girl, she should be out having a good time, but she keeps saying she has a feeling she's not long for this world. My husband Lewis — the rotter — left us last winter and never came back. He had the nerve to say our sax life was terrible! Even the dog, Speedwell, is driving me up the wall. Everything seems so draba and dryas. Doctor, since you took your hippocrepis oath, have you ever seen such a haplopappus case?"

"Mrs. Tweedy, you don't have plumbago or pulmonaria. You've just got a little anacyclus depressus. My advice is to spend a lot of time in the sunshine and keep your feet dry. Try this prescription and let me know if you don't feel better soon. See you next week!"

— Barbara Hindanhill

# A Visit To The Flowery Kingdom

## Part II

RONALD A. BECKWITH

Southampton, Massachusetts

Pictures by the author

It is amazing to recall that before I went to Sikkim I consulted maps and books, and when I saw all those dots and place names on the map I thought "Gosh, it's like suburbia out there." Believe me, it is not so. Dzongri is a collection of three stone shelters and nothing more. Bakhim — two huts and the "tourist lodge." Tsokha, with five or six four-room houses is quite the metropolis. Thangsing is nothing more than a clearing; literally translated, that is what Thangsing means.

At Dzongri we decided to split the party in two. Those who wanted to botanize more slowly planned to stay behind for a day and then go on to Thangsing; the rest would push on ahead and go for the Goecha La (Pass). The majority decided to go on ahead; I opted to stay behind to explore what appeared to be an interesting area.

Our camp was beside a small stream in a horse-shoe shaped valley. The head of the valley is some five or six hundred feet higher than the valley floor, whilst the tail appears to drop off into space to the river 6000 feet below. The rim of Dzongri valley is clothed in rhododendrons, mostly *R. lanatum* and *wallichii*. The valley floor was richly endowed with *Primula calderiana* and *P. glabra*, indeed, our tents were pitched on them. In the wetter areas were still more rosettes of other primula species, and also one solitary flowering *Caltha palustris* var. *himalensis*. At the tail end of the valley, amongst the larger rhododendrons, was *Clematis montana*, not yet in flower, surprisingly in considerable

shade. Towards the head of the valley, *Rhododendron anthopogon*, *lepidotum* and *setosum* were growing in great stands. Most were no higher than thirty inches. Unfortunately, we were too early for their great exuberance of bloom. There was just the odd flower here and there. On the sides of the valley *Meconopsis simplicifolia* and *M. paniculata* were growing, but not in flower. However, the great golden-haired rosettes of *M. simplicifolia* shone like freshly cast bronze when the late afternoon sun caught their furred leaves, and they hardly needed blooms to enhance them. On a peaty bank, oozing water, *Primula deuteronana*, a charming member of the Petiolaris Section, was flowering; a lavender pink flower with an orange-yellow eye. It was no more than two inches high, with attractive dark green, shiny, toothed leaves, a most delightful find. Finding the perfect flower for a photographic portrait, however, was not an easy task, as all seemed to have been touched with frost, but eventually a freshly opened head was found. All these primulas were growing in very wet, peaty areas, and mainly they were to be found on the vertical faces of banks that oozed water, not precisely the type of situation most of us have in our gardens.

Further up the slope, *Fritillaria cirrhosa* was found just breaking out of the bud. Very few of these plants were seen, no seed was found, and none were in full flower.

At the top of the ridge, *Polygonatum*

*hookerii* was flowering beside an animal track, where very poor sandy soil characterized a heath-like area on the rim of the valley. The polygonatum was the tiniest thing — a real gem. The flower, somewhat out of scale with the rest of the plant, was infinitely more attractive than that of our own polygonatum. It was deep pink, upright, and about one inch across, the deep rose pink on the outside of the corolla fading to a pale pink with age. The leaves were just emerging from the soil so I am unable to give any description of them. At the point at which I saw the plant, it was no more than one and a half inches high. *Lloydia delavayi* was also seen in this area and just beginning to show yellow in the buds.

From this ridge one could see another much higher ridge beyond, on which one could just make out some prayer flags. This I like to refer to as "Prayer Flag Hill." Continuing around the rim of the

valley, we ran into more rhododendrons with all sorts of herbage growing at the edges of the stands, *Bergenia purpurens* being particularly evident. On the Dzongri side of the rim, an area appeared to have suffered a fire; charred remains of rhododendron stumps were now grayed by weathering. In amongst the stumps were *Sedum himalense*, just about to come into flower, a rather gawky plant and not particularly attractive. Nearby in an open grassy area, *Gentiana pedicellata* or *miniata* grew, so small you had to get down on the ground to appreciate its very beautiful flower.

The nights were bitterly cold, so much so that I dressed up to go to bed and, despite a very adequate sleeping bag, was still very cold. How vividly I recall those mornings at Dzongri. About 4:30 a.m. one heard "Cuckoo! Cuckoo!" You didn't need an alarm clock. This particular bird had a rocky ledge up at the head of the valley. On and on he went, and with that



*Primula deuteranana*



... and beyond was Kanchenjunga.

interminable racket, sleep for me was impossible. At this early hour it was brilliantly clear, and the sun was just clearing the ridges. A walk up to the top of "Prayer Flag Hill" revealed the Great Himalaya in all its glory. As far as the eye could see there were colossal snow-clad mountains, so overwhelming that human senses were totally unable to comprehend their enormity. From west to east, mountains filled the sky, Rathong (22,000 ft.), Kabru (24,062 ft.), Kanchenjunga (28,208 ft.), then the Valley of the Prek Chu, with the Goecha La (Pass) (16,500 ft.) at its north end. The towering massifs of Pandim (22,000 ft.) and Jopino (19,479 ft.) formed the eastern side of the valley.

Perhaps special mention should be made of "Prayer Flag Hill." I can only estimate that its altitude must have been in excess of 14,000 feet — a mere hill in this territory. The sherpas called it Dzungri View, but I think "Prayer Flag Hill" is much more descriptive and if any of you make the trip you will certainly know which one it is. There are many prayer flags on the ridge, put there, we were told,

by pilgrims to blow their incantations north to Kanchenjunga: "Om mani padme hum" (Jewel in the Lotus, Hail). There is also a small chorten (shrine) on the ridge in amongst the flags where I left small offerings in U.S., British, and Indian currencies, backing my horses many ways.

Having used up a lot of film, it was time to go back down to the camp and breakfast, after which we set off round the western edge of "Prayer Flag Hill" and east across the rolling Dzungri heath. Through the "city" of Dzungri (not even a stop light) and onward we went. It was interesting to see that the whole of the north-facing slope of "Prayer Flag Hill" was dominated by many species of rhododendron. Then, at the bottom of the slope, there was a dried up watercourse which was a convenient dividing line, for on its north side, covering the south-facing slope of the Dzungri heath, there were low-growing juniperus species. On our way we passed many great stands of dwarf rhododendrons with, alas, only the odd flower here and there. As we walked across the

Dzongri heath, the sherpas told us that it was virtually impassable during the monsoon. As we passed the Dzongri chortens, masses of *Androsace lehmannii* hummocks were seen, but, alas again, not in flower. Some seed was garnered from the remaining capsules. For a brief moment the clouds cleared, and right ahead was Pandim.

We started to go down and passed through the landscape in reverse order. First came the dwarf rhododendrons, then larger rhododendrons, and finally *Abies spectabilis*. At the Prek Chu (River) our sherpas cooked up a splendid and very welcome meal on short notice.

Around the river crossing area *Salix sikkimensis*, with its large yellow catkins, was a sight worth seeing. The plants were all shrub-like, the tallest one that I saw being no more than ten feet high. *Chrysosplenium nudicaule* var. *intermedia* was

also found in a wet area at the crossing. How should I describe this attractive plant? It is in the Saxifragaceae. The flowers are yellow, very small, and quite insignificant. However, they are surrounded by brilliant yellow bracts. No more than four inches high, this very interesting plant is one that ought to be in our gardens.

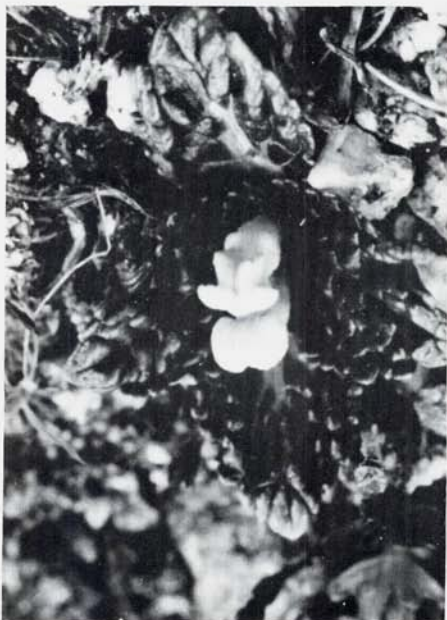
At this river crossing, there is a wood-cutter's shelter, and I must confess to being rather awed by the amount of work done by these people. With nothing more than an axe and an adze, large firs had been felled, trimmed, and cut into planks, an incredible amount of work, and mostly done by one man. It was interesting to examine the stump of one of the fallen firs. It was approximately 150 years old. For the first fifty years, the rings were well spaced, about half an inch apart, but after that, the growth rate was severely re-



*Chrysosplenium nudicaule* var. *intermedia*

duced, and the rings were only about three-sixteenth's of an inch apart. Whether this was the natural growth habit of the tree, or caused by a marked change in the climate of this part of the Himalaya, I am unable to say.

The Prek Chu is a glacial river running in a very rocky channel. At this time, it was extremely turbulent, milky green, ice cold, and very noisy. All along the rocky shore, *Myricaria germanica* var. *prostrata* romped over everything. Not a plant for the rock garden, I would think, although only about twelve inches high. It appeared very invasive, and its muddy purple-pink flowers could be hard to take.



Unknown Scrophulariaceae

After we crossed the Prek Chu, it suddenly became cold and misty. Our path was not an easy one, rather resembling a fell field, with boulders that were at times quite slippery. We finally arrived at Thangsing at about 4 p.m. The clearing is about the size of a small airfield and is in a valley that runs north to south with the

Prek Chu on its western side and an almost vertical wall of an unknown "hill" rising on the far side of the river. There seemed to be an incessant wind blowing at Thangsing, and no sooner had we set up the tents than it started to snow. Understandably, we turned in quite early. The sherpas had suggested that a bottle of Sikkim Black Cat Rum was the stuff to take to the mountains, and it came in very useful now to keep the cold at bay.

The following morning I awoke and tried to leave the tent, but the zipper was firmly frozen. Eventually, the sun rose and thawed it out, and as I pulled it up, Pandim, all 22,000 feet of it, filled the entrance. I almost shot out of the back of the tent, and for several minutes I was completely overcome. When we had arrived at Thangsing the day before, it had been dull, misty, and snowing, and there was no suggestion of the presence of such a spectacular mountain. Now it was there! Peering out of the tent to the east Jopino soared straight up above us. At the north end of the clearing there were yak grazing as a Tibetan family had settled in during the night in their yak hair tent. The Sirdar told us that these people were on their way to higher grazing ground for the summer. It seemed a simple life, uncluttered by our "civilization," but no doubt the Tibetans have just as many strictures, taboos, and worries of various kinds as we do. During breakfast, the animals and their owners moved out. They went straight up the side of the valley to the east, and the flat clangor of the lead animal's bell was soon lost to the clouds on the ridge. How nice it would have been to go with them and learn their ways.

After breakfast, my porter and I went off plant hunting. We headed north up the valley until we reached a stream coming down from Jopino to the east, and decided to follow this. *Primula* rosettes were everywhere, and some seed was collected by harvesting many of the previous sea-



son's capsules. Beside the stream, in almost pure gravel, we found a rock gardener's dream come true — a small plant without a visible stem, four decussate leaves, shiny and crinkled, in the center of which were two hooded yellow flowers back to back. The whole plant was no more than two inches high. Only three plants were seen, two of which were in flower. Tony Schilling of Wakehurst Place in England is unable to identify it, but suggests Scrophulariaceae. I really think that to have seen this delightful plant in the wild made the whole trip worthwhile for me, but how I wish it had survived the trip back.

As we laboured upward, we saw primulas everywhere and all sorts of other small plants — But! But! But! — nothing in flower. However, cushion plants abounded and we were able to collect seed from old capsules. On the side of the gully, in the rhododendron scrub, the empty seed capsules of a lily tantalized my imagination. Finding a plateau, we left the stream and walked out onto a meadow-like area. Everywhere, *Primula glabra* was in flower, and among them the rosettes of what looked like *Primula capitata*. Right above our heads, through the swirling clouds, the snow-clad peaks of Jopino loomed. Looking northward, we could see the great terminal and lateral moraines of the Onglaktang glacier which comes off

the side of Kabru, and beyond that was the side of Kanchenjunga and the Geocha La (Pass). It was all quite overwhelming.

From where my porter and I sat and ate lunch, we could see the glacier of Jopino and its terminal moraine. There was nothing I wanted more than to walk on that glacier and moraine, yet I couldn't find the will to do it. I could weep with frustration now. It was no distance to walk, a mile at the most. Altitude certainly does strange things to some of us, or perhaps it was disappointment at not finding more plants in flower that sapped my will to go higher.

It seems certain to me that the Sikkim flora doesn't react to the retreating snow as our North American plants do. Rather, it seems geared to the monsoon, at which time, however, travel would be exceedingly difficult.

A few days later, we made our way by Gangtok and then went by bus down to the airport at Bagdogra. We drove along beside the Teesta River ever downward, and suddenly we came to a rotary. We took a right turn and that was it — the Himalaya on our right and the plain of India on our left. Just like that, it was all over, the trip of a lifetime finished.

As Shakespeare said in *All's Well That Ends Well*, . . . "Oft expectation fails and most oft where it most promises."

*End of two part article*

## Garden Renewal

Humus is rapidly oxidized . . . after four or five years each part [of the garden] will require to be remade. One may not be able to move some well-established shrubs, but everything else should be lifted and plenty of vegetable matter dug in before replanting. One should plan a rotation so that part is remade each year . . . October is the best time.

— Quoted from the Alpine Garden Society Bulletin by R. D.

# AVEN NELSON, PIONEER BOTANIST

RUTH ASHTON NELSON  
Estes Park, Colorado  
Photograph by Paul Shope

During his first few years at the University of Wyoming in Laramie (then Laramie City), beginning in 1887, Aven Nelson learned and taught a good deal about biology. In 1891 the Experiment Station was established at the University and the professor of botany was named Botanist of the Experiment Station. This added responsibility increased Nelson's feeling of a need for a graduate study and in 1891 he asked for a leave of absence and went to Cambridge for a year. He still had no special interest in taxonomic botany but studied the physiology and morphology of plants and animals. Though he had had no previous formal college training in science and only a normal school degree, he was able to earn a Master's Degree in Science.

In 1892, Dr. B. C. Buffum, who had substituted for Nelson during his absence, had made a collection of specimens of forage plants for the Chicago World's Fair of 1893 and when Nelson returned he found that the disposal of these plants was up to him. Without training or experience in this field and with the most meager equipment: two inadequate books, an alcohol lamp and a test tube, but with diligence and a natural interest in the phenomena of nature, Aven Nelson entered on the course which was to make him one of the great systematic botanists in the United States.

His reference library consisted of Gray's *Manual of Botany*, dealing with the "Central and Northeastern United States and Adjacent Canada," and Coulter's *Manual of the Botany of the Rocky Mountain Region*, published in 1885. The

first dealt with an entirely different flora, and the second was hardly more than a compilation based on the few collections made in this area up to that time by early explorers.

Discovering that the plants he was working with did not fit any of the described species in these books, Nelson became more and more convinced that he was dealing with species previously unknown and in 1896 he timidly offered his first botanical paper to Dr. Underwood, editor of the *Torrey Bulletin*. Its cordial reception encouraged him to further adventures in this field and soon he was a regular contributor to several of the journals including the *Botanical Gazette* and *Erythea*. During the years 1898 and 1899, a series of papers under the general heading "New Plants from Wyoming", appeared in the *Torrey Bulletin*. Later Professor Nelson's published papers were gathered into a volume which was offered as his thesis for the degree of Doctor of Science conferred on him by the University of Denver in 1904.

In 1894 the botanist joined forces with the University geologist, Professor Wilbur Knight, on a summer field trip. With a team of horses, a lumber wagon and a saddle horse, these two professors crossed the state of Wyoming diagonally, camping near the good collecting grounds, living partly off the country, visiting the oil seepages, which later made millionaires of lucky men, discovering valuable vertebrate fossils and many new species of living plants. They traveled 800 miles, to the Jackson Hole country and back.

From 1894 until the time the summer

session required his teaching services, Aven Nelson spent every summer in the field collecting plants, sometimes by horse and wagon, sometimes by train and bicycle, later by automobile. As a result of these trips, the plant collection at the University grew rapidly. It soon expanded beyond state boundaries and in 1899 was designated by the Trustees of the University as "The Rocky Mountain Herbarium."

Aven Nelson succeeded in building the Herbarium while carrying a full teaching load. He often said, "teaching was my vocation, building an herbarium my avocation." He took his teaching very seriously, always giving to it his best effort and the first demands on his time.

In addition to his teaching and research work this man had time for community service. Several different times he carried the responsibility for the University as acting president. He planned and supervised the planting of trees on the campus, and did much of the actual work himself; all of the early plantings and the groups of large spruces are his handiwork. During these years he wrote, besides his scientific papers, many Experiment Station bulletins.

In 1905 the legislature created a State Board of Horticulture and named the University Botanist as its secretary. From then until 1922, when the Board was dissolved, Dr. Nelson filled this position.

About this time work was begun on the *Manual*, nominally a revision of the old Coulter *Manual of Rocky Mountain Botany*, but actually a new book. So much information had come to light as a result of the investigations of Nelson and others working on the western flora, that botanical leaders, including John Coulter, were urging Dr. Nelson to prepare a textbook of western botany. In 1909 the book came off the press. It was then accepted as the authority on the Rocky Mountain flora.

Here something must be said in appre-

ciation of Alice Nelson, the wife and mother who kept things running smoothly at home. No husband could have accomplished what this man did without the loving sympathy and support of a poised, unselfish and competent helpmate. On field trips she carried her share of the camp routine and on days of heavy collecting she and the two daughters helped with the plant work. In the president's house she was a gentle and gracious hostess. Her passing in the summer of 1929 was a loss to the community as well as the family.



Dr. Aven Nelson, 1930-1931

In 1917, on the sudden resignation of Dr. Dunning, Professor Nelson was made president of the University and served in that capacity through the troubled time of the first World War until October, 1922.

He had been a fellow of the American Association for the Advancement of Science since 1901 and regularly attended the annual meetings of that society. He attended three International Botanical Congresses: Ithaca in 1926, Cambridge in

1930, and Amsterdam in 1935. In 1935 he served as President of the Botanical Society of America and in that capacity was a delegate to the Congress. He was instrumental in organizing the Colorado-Wyoming Academy of Science. In 1931 he was elected President General of Phi Kappa Phi, in which capacity he served for four years.

Following his seventieth birthday he was relieved of part of his teaching load. This, to him, was merely an opportunity for more collecting and research work. Gradually his teaching and administrative duties lessened, although he continued to teach at the University Summer Science Camp and to act as Curator of the Herbarium for ten years longer.

In 1930 Ruth Ashton came to Wyoming

as graduate assistant in the Rocky Mountain Herbarium and in November, 1931, the Curator and his assistant went quietly to Santa Fe, New Mexico and were married. From that time on they made plant collecting their main interest. Their travels carried them from Victoria, B.C. to Pensacola, Florida, and from Montreal to Acapulco, Mexico, with side trips to Europe and Alaska. Dr. Nelson remained active and interested in the Herbarium and in collecting until his death in 1952 at the age of 93.

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*Excerpted by John G. Worman, Littleton, Colorado with the permission of the Denver Botanic Gardens from an article appearing in Green Thumb, Vol. 34, No. 1.*

## A Collector's Plea

Paul Furze was one of the noteworthy collectors of irises and bulbs in general in Turkey, Iran and Afghanistan in the 1960's, and a very great debt is owed him by horticulture in general for the many good things he brought back to be shared, as well as for the vast amount of understanding he was able to contribute to plant knowledge of the area, including that of the alpenes, in a botanical sense.

"It is of great value", he wrote in the Bulletin of the British Iris Society for 1971, "if growers keep some records of experience with collected material and notes on their variations, with photographs when possible, so that the collector's work can be harvested and threshed out. So often plants are seen once in the wild, and frequently without flowers or even leaves, so that the collector cannot tell exactly what they are until they flower

at home or in other's gardens. Notes or photos can also expose the common trouble of two things collected under the same number (without the collector's knowledge) or of plants and labels having gotten mixed up".

John Watson has expressed the same thoughts. He would be most interested to hear of any success or even non-success, as well as methods of handling, of interesting variation, from all those who grew the Andean collections, and now with the most recent Turkish things.

Unfortunately, however, though he will be most grateful for any such information, he regrets he would be unable to enter into correspondence with those who send it in. Such information should be sent to John M. Watson, Mill Farmhouse, Whatlington, Battle, E. Sussex TN33 0ND, England.

—R.D.

# The Reconstruction Of "America-Gothenburg"

H. ZETTERLUND

Botanic Garden, Gothenburg, Sweden

Pictures by the author

The Botanic Garden of Gothenburg was planned and partly constructed in 1917. The large rock garden, built mainly in the period 1921-1922, is situated in a valley on the outskirts of the garden. The site, once a quarry, is framed by red granite hills wonderfully worked by time and ancient icecaps.

The pioneer construction team consisted of several men and one or two horses, which, with the aid of wagons and tools, created a rock garden in the spirit of L. B. Meredith's *The Rock Garden*. Once it was probably a fine rock garden in most ways, although by no means as aesthetically perfect as some British gardens of the 1930s, built after the pattern of Symons-Jeune's *The Natural Rock Garden*. However, some mistakes of the original builders are apparent now, sixty years later.

Their main mistake was to build the rockery on a foundation of clay, which was brought from the vicinity by horse and wagon. It is not clear if the reason for using clay was for water retainment or just because clay was the cheapest material. Anyway, the clay has turned the gardener's best friends, the earthworms, into his enemies. Their activity, which normally is of such immense benefit to the soil and plant life, has mixed the soil with the clay and blocked the drainage. This has created an environment not at all beneficial for rock garden plants. The sticky, soggy clay also serves as a home for the rhizomes of our worst weed, *Equisetum arvense*, the horsetail.

Those two factors plus a decrease in the

staff number have had a negative influence on the quality of our rock garden. We realized we had to make some drastic changes in order to gain the quality we want. So in 1978 we started the reconstruction of the rock garden, an enterprise which, with our resources and intentions, will be concluded within fifteen to twenty years. Apparently the success of the project will depend on our patience.

Our intentions are as follows: To create optimal environments for the plants we want to grow; to decrease the areas that demand intensive attention; to increase the botanical quality of such areas; to simplify the care of less intensive areas; to facilitate public access to the garden; to increase the aesthetic qualities. Six premises, of which the last will be the hardest to fulfill.

The size of our rock garden has permitted geographic division. Thus each of the three continents especially important as origins of rock garden plants, Europe, America and Asia, is represented by a separate area.

The area that represents America was built ten years later than the others, so one would assume it to be in a better condition than the rest. But apparently it had been designed by a different team to judge from the complete absence of any aesthetic value. And the influence of clay was just as evident here as in the older parts. These two factors plus the position of "America," situated as it is, in a part of the rock garden which made reconstruction possible without disturbing the other

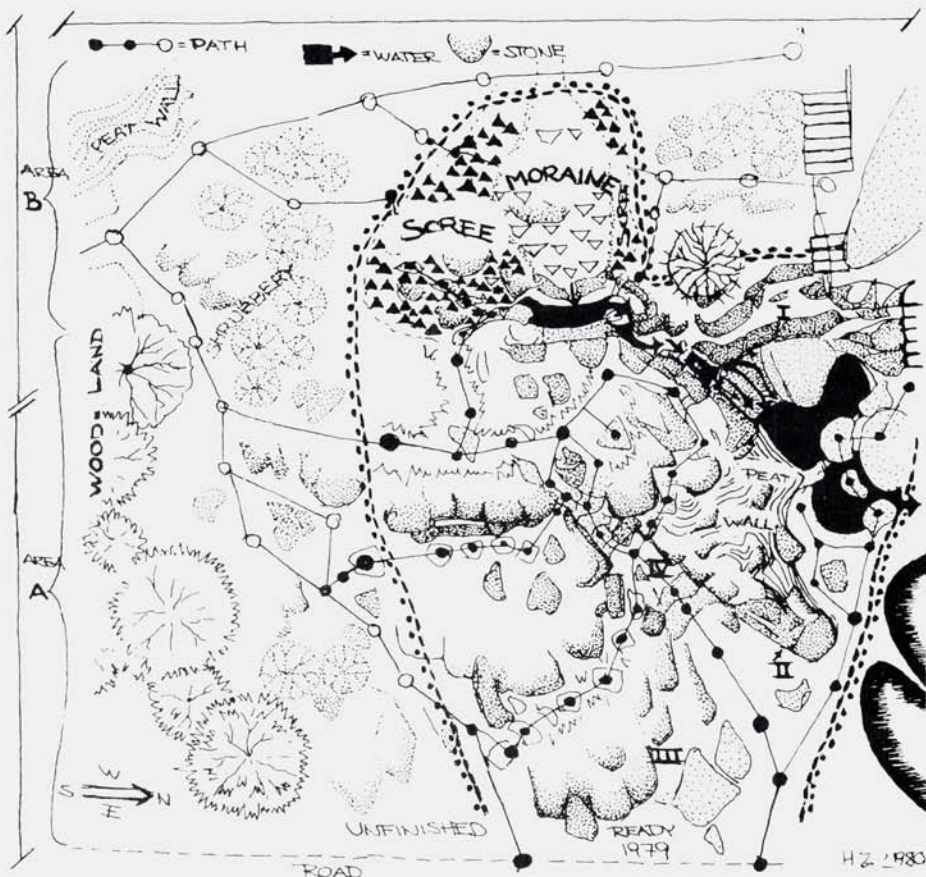


Fig. 1—Map of 'America-Gothenburg'. Finished area discussed in this article is within heavy line.

parts aesthetically, constituted the main points of consideration at the onset of the reconstructing project.

We began the work in April 1978 with the evacuation of plants, which were placed in frames next to the greenhouses in another part of the garden. Then the useful soil was taken away for chemical sterilization and improvement by mixing it with sand, peat, lime and nutrients. Stones and boulders were removed (the smaller ones by hand and the larger ones by means of a tractor) and placed on a lawn close to "America." They were sparsely placed so as to make it possible

for us to study each stone separately later. Since the working area was rather large (ca 400 m<sup>2</sup> or approximately 480 square yards) and the staff involved consisted of only two to three men, this phase of work was extremely time-consuming.

At any rate, by midsummer "America" was bared down to the foundation of clay. The depth of the layer of clay varied from 20 cm to 200 cm (8 to 80 inches) and the plan was to remove the lot. Optimistically we started the removal with manual power. At first this was exciting work since the clay contained a lot of hidden treasures. We found old beer and chemist's bottles,

old crockery, and a little porcelain lady about 10 cm (4 inches) tall, dressed in green ("The Goddess of Clay"?). After a short while, however, we found the task much too time-consuming.

Fortunately, the day after the revelation of the "Goddess" we were informed that we had been allotted an extra subsidy for our project. This made it possible to get rid of the clay with the aid of an excavator and lorries. Two hundred and fifty cubic meters (approximately 330 cubic yards) of clay were removed this way.

During the removal of this thick layer we made some interesting observations. For instance, we were able to discover how deep the earthworms were working: we found the bravest "clay diver" at the depth of one meter. The equisetum rhizomes were to be found all through the layer (2 m). The clay is acid and consequently lacks a great deal of the aggregation qualities that are characteristic of alkaline clays and I would therefore guess that the mentioned depths would have been even greater in such a clay. At the bottom of the layer we found old pieces of wood which had remained intact because of the anaerobic conditions. The smell of that layer was disgusting.

In August, 1978, we started the actual rebuilding. The preparations for this had started during the previous winter. Some sketches had been drawn and we had tried to make a small scale model in a sand-filled frame. This was supposed to serve as a basis for successive improvisations during the rebuilding. We knew from the beginning that it was impossible to rely too much on an abstract drawing due to the individuality of each stone, which forces you to do the actual designing while you are building.

The area now consisted of a gentle slope (Part A in Map, Fig. 1) abruptly becoming steeper at the top (Part B in map).

First, Part A was formed into two ridges and a plateau by means of shaping the drainage material. This drainage was constructed as shown in Fig. 2, with a gradual decrease in the size of the stones to prevent the overlaying soil from sifting down.

Then the actual rock work began. After some hesitation we decided to start in a corner of Area A (Fig. 1, I). Normally you're supposed to start at the lowest part, but as we needed the assistance of a tractor to carry the larger stones we had to start here to avoid blocking our way.

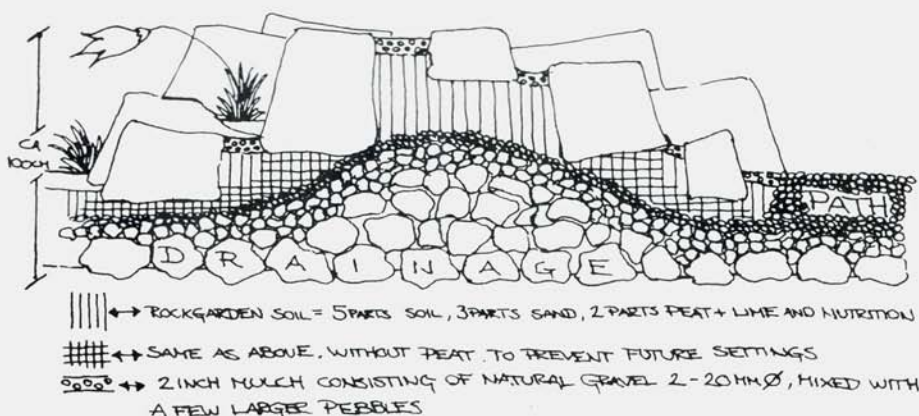


Fig. 2—Schematic drawing of soil and drainage material in Area A of 'America-Gothenburg'.

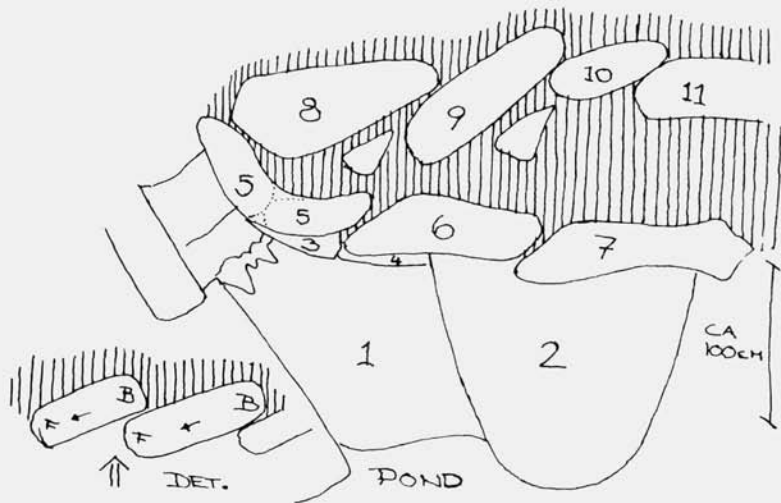


Fig. 3—Diagram of construction detail: I at top right corner of Area A.

As already mentioned, the surrounding hills consisted of red granite, so did most of the rock garden stones. Granite is not considered to be suitable for rock garden construction since it lacks stratification; but, though not stratified, it has a pronounced pattern of splitting, which it is possible to imitate and stylize. The stratification of lime — and sandstone — gives rise to a very compressed splitting pattern, compared to that of granite. This made it impossible to follow the ideas promulgated by Symons-Jeune in *Natural Rock Gardening*, which should be the holy book for every rock garden constructor but is unfortunately written with stratified lime and sandstone in mind. Nevertheless, as granite was the only material available, we had to adapt ourselves to this and find a design which would hold the construction together.

When you create a rock garden you are trying to translate a piece of nature — the natural habitat of the plants you intend to grow. At the same time, you are forced to create a wide range of different environments since the requirements of "alpine" plants are very variable. Thus you are try-

ing to compress a large area of nature into a very limited garden space, which can easily cause your garden to become a chaotic heap of stones. The main task of rock garden construction, as I look upon it, is to stylize nature.

We decided that the prototype for "America" was not to be a mountain, since this is almost impossible to reproduce in a natural way. What we have built is what you might call a rocky meadow, rich in small outcrops. I consider this to be a good way of building, because it decreases the risks of an aesthetic failure due either to a too chaotic or too formal way of arranging the stones. This method also gives one the opportunity to mix rock — and meadow-plants — in the way that they are mixed on an alpine meadow, where the rock-plants have migrated from the mountain cliffs to the outcrops several hundred meters below and have been surrounded by the more vigorous meadow-plants in a most charming way.

Because granite is unstratified we decided to build small, eye-catching outcrops by using the best stones. The outcrops were spread sparsely over the gently



sloping area, but as the slope became steeper, the distance between them was diminished. These outcrops were the details that were united into an entity, partly by their grouping and partly by our use of subordinate stones to tie the outcrops to each other and to the slope.

We started to build in the north-west corner of Area A (Fig. 1, I). The considerable difference in height (2 m.) forced us to construct a small rock-face (Fig. 3). This was built in three layers connected with two huge boulders (Fig. 3, stones 1, 2) which had been buried in clay for fifty years. Stone No. 1 is about half a meter lower than stone No. 2 and is now washed by the water of the stream flowing toward the pond below the stones. Stone No. 2 serves as an ideal seat for contemplating the different states of water. The stones in the upper layers (3 through 11) are all about the same size and shape. What's important about this construction is the way the front (F.) of the stones are put on the outside of the back (B.) of the stone next to it (Fig. 3, detail). This makes the rock face look more natural and gives you

superb fissures to plant in. The stones of this construction were not big enough to withstand frost-lifting. They were therefore rock supported from below and behind by rockwork to insure perfect drainage.

The next detail is a peaceful one (Fig. 4), which marks the end of the secondary ridge (Fig. 1, II). When planted it will appear as one huge stone.

The third detail (Fig. 5. The heap of gravel is not supposed to be there) is perhaps the most important as it is meant to tempt visitors to have a closer look at "America." For that reason it has been built in a rather dramatic way, with two big eye catching stones placed in an upright position to give an impression of hugeness. To strengthen this impression we have supplemented these with two flat stones placed in front of the others. The two different patterns have been tied together and led into the slope with the help of smaller stones. This construction is the end of the first (and main) ridge (Fig. 1: III).

Between the two ridges there is naturally a minor depression (Fig. 1: IV). This



Fig. 4—End of Secondary Ridge: II on Map.

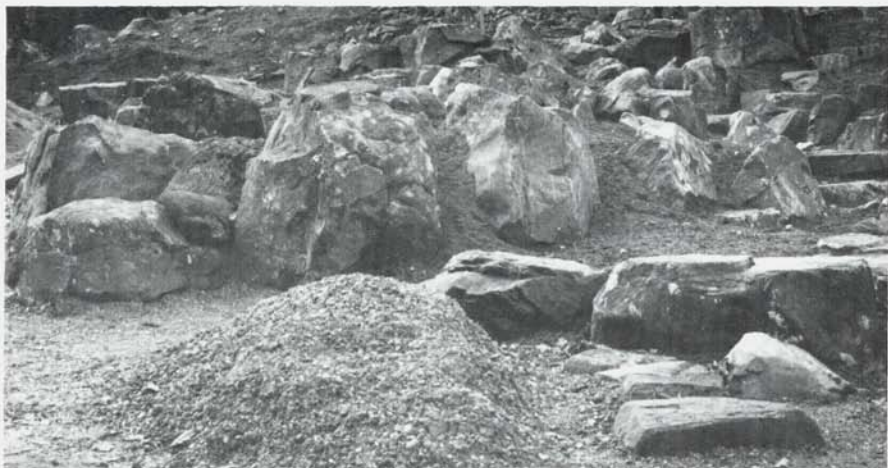


Fig. 5—End of Main Ridge: III on Map.

has been arranged to give the impression of a dried-up brook (Fig. 6). It is mainly composed of flat stones flanked by chunkier ones. The dry brook will serve mainly as a path, although there are going to be plants wherever possible. The path in the brook leads up to the plateau, which is planned to give the spectator a little breathing space before he enters more demanding areas, such as the scree and the moraine. The planting of the plateau



Fig. 6—Dry Streambed between Ridges: IV on Map.

will therefore be serene, containing only a few chosen species.

Further up towards the steeper slope, the calmness will change into what you might first interpret as a chaotic heap of stones: this is the scree (Fig. 7). When you get used to it you may eventually find it beautiful, as I do. The scree is built on the steep slope and rests directly on the bed-rock. First a 40 cm. (16 inch) layer of round stones, useless for rock-work, was placed on the bed-rock (Fig. 8) and the spaces between these stones were filled with sand. Then another 40 cm. layer of scree-soil was put on. This soil consists of five parts of soil, three parts of peat, two parts of sand and ten parts of pebbles.

Next, I built a path winding up through the scree and put in a few larger stones, formally and calmly placed. The area was then handed over to a weird hillbilly from the outskirts of Gothenburg. He wanted it to look real, so he covered the surface with pieces of frost broken red granite from the neighbourhood, which he placed one by one, thousands of them. The result is really pleasing. It does in fact look like a natural scree, except that there is no rockface above it.

Directly connected with the scree, a



Fig. 7—The Scree

moraine has been constructed. It was made in the main by following the sketches and instructions in L. Bacon's *Alpines*, so if it doesn't work we will blame Mr. Bacon. The foundation consists of concrete (Fig. 9). The edges are about 50 cm. (20 inches) high, and on the bottom there is a system of almost transverse elevations which makes the water zigzag as it runs

down, so that the whole area benefits from the underground irrigation. The concrete bottom will be covered by small rocks and pebbles to permit a constant flow of water, and over this will be placed a thin layer of rough peat to prevent the soil from washing away. The soil will be the same as in the scree, and so will the surface-cover.

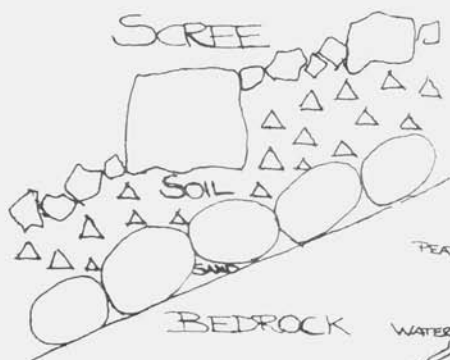


Fig. 8—Schematic drawing of Cross Section of Scree

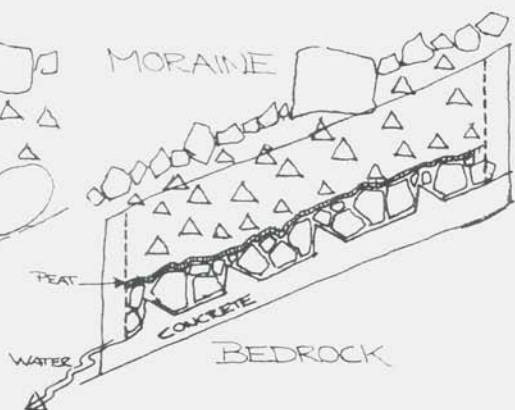


Fig. 9—Schematic drawing of Cross Section of Moraine.

From the moraine the water-system will exit as a spring. As we want to have a great deal of water in the stream, and we are not certain that the moraine can handle all of it, we have, to prevent a future catastrophe, laid a pipe through the moraine. The pipe is connected with the inflow for the moraine in such a way as to make it possible to regulate the stream and the moraine separately.

The last creation I would like to mention is the peat wall (Fig. 10). When the restoration is completed we will have two peat walls, one exposed to sunlight and one in shade. The sun-exposed one is already completed and was planted in Spring 1980.

A remarkable thing about this peat wall is its integration with the rockwork. To a peat garden enthusiast this might seem a bit out of place, since peat-purists mostly look upon peat-gardening as a purely organic matter. But if you are walking in a

high-mountain area you will often come across sections of landscape that give the impression of peat walls with rocks in them. It might be a stream-bank, a sheep-track, or any place where the turf has been worn off so that the often impressive humus deposits lie exposed. This naked soil becomes colonized by a wide range of plant species which can't compete with the more vigorous flora of the turf.

What remains to be done in "America" is a very little rockwork. As you can see on the map (Fig. 1), the rest of this area will be dominated by shrubberies. We intend to unite the woodland, which now ends abruptly, with the rockery in a more harmonic way. This is to be done by creating a verge where the height of the vegetation gradually diminishes.

Two more ponds are also planned in the north-eastern corner (Fig. 1). The pond edges will be surrounded by boggy areas, one rich and one poor.



Fig. 10—Peat Wall abutting Ponds. Shown at far right center of Map.

As you will have seen from this article we have created (and will create) such a wide range of plant environments that it should be possible for us to cultivate almost any hardy American plant. Our big problem is that the real America is situated quite a distance from the "America" of the botanic garden of Gothenburg, therefore it is our hope that this article will inspire plant enthusiasts from Alaska to Newfoundland, and from Franklin District, Northwest Territories to Tierra del Fuego to give contributions of plant material to "America-Gothenburg."

We will appreciate plants or seeds of any choice (your opinion) species, any good selection and any superb form of an American species. We will do our very best to maintain it and propagate it, so

that the day you decide to visit our garden we shall be able to show you your particular plant.

Any contribution will be welcomed but just to inspire you I have made a short list of what comes to my mind at this moment: plants of Pyrolaceae, Orchidaceae, Lycopodiaceae and Botrychium; seeds or plants of *Boykinia richardsonii*; primulas, especially *P. tschuktschorum* and *P. cusickiana*; alpine dodecatheons, douglasias, *Dicentra uniflora* and *D. pauciflora*, phloxes, violas, lewisias, lilies, trilliums, hesperochirons, suksdorfias and so forth; . . . and if there is a Patagonian among you, calceolarias, ourisias and violas etc. I could continue for several pages, but I guess it's time to stop.

Welcome to Gothenburg!

*Those who wish to contribute plants to "America-Gothenburg" should send them to: Botanic Garden, Att. H. Zetterlund, J. Persson, S-41319 Gothenburg, Sweden. Living plants should be packed (not necessarily bare root) in a plastic bag with semi-moist peat or sphagnum moss around the roots and sent in a small package, first class airmail. It is also possible to send bare-rooted plants completely sealed in a plastic bag with no added moisture. Seeds are also acceptable. Packages should be clearly marked: Botanic Specimen, Scientific Use, No Commercial Value.*

## Acid Rain, A Benefit?

Many articles have been printed recently on the deleterious effects of acid rain. Rain becomes acidified when it picks up airborne oxides of nitrogen and sulphur dioxide, among the many pollutants we are pouring into our atmosphere these days, and combines with them to form nitric and sulphuric acids.

Acid rain has not only acidified some Adirondack lakes to the point where fish can no longer survive in them, but greatly increases the incidence of "stone disease", which hastens the disintegration of marble sculpture, cement, limestone buildings, and, we assume, mountains. Acid rain, however, may be of considerable benefit to farmers and gardeners, according to some authorities, as sulphur is not only a constituent of fertilizer, it is also an excellent fungicide. Have you noticed whether or not your alpine plants are suffering less from the "mugs" now that they are being watered with a dilute solution of sulphuric acid?

# The Propagation Of Alpine Plants

DORIS PAGE

Victoria, British Columbia

My thirty year experience propagating alpine plants has been in a commercial nursery (Lohbrunner gardens in Victoria B.C.) as my home garden is mainly planted with shade-loving and woodland plants. Because of this I realize that many amateurs may find it difficult, as I do at home, to provide what is referred to as a "buoyant atmosphere" in the frame or greenhouse. To me this means adequate light and air, never too dry, never too moist.

The big greenhouse at the nursery has more length and height than most home greenhouses. Another feature of nursery growing is that there is usually someone to look over the plants several times a day, especially if more than one person is concerned with the care of the place. Thus signs of insects, mildew or dryness are quickly noted and dealt with and rooted cuttings are potted on and seedlings pricked out before they become drawn. There is also adequate bench space in a nursery greenhouse for the growing on of the young plants before they are transferred to the outdoor cold frames.

The only heat we use at Lohbrunner's is that in the hotwater pipes beneath the benches in the house where we have the propagating bench. Here the thermostat is set so that heat only comes on when the temperature goes down to freezing. Shading is very important, but must not be overdone. Most important of all: *the cuttings must never dry out*. We do not use mist or artificial lighting, but if you have had good results with such aids, by all means continue to use them.

The cutting bench is constructed of planks laid on ledges between two cement walls (one the outer wall of the house) so

that the top of the front wall rises a little above the boards to make a narrow sill across the front of the bench. This also means that there is open space beneath the planks. Drainage is important, so if a sheet of plastic is laid over the planks one should be sure to make enough holes in it. A layer of sand is laid on top of this and three inch *clay* pots are set out closely upon it, along with some four inch *clay* pans in case these may also be needed. The surface of the pots should be on a level with the top of the inner wall and as near as possible to the bottom edge of the glass above the outer wall. Fine sand is then spread over the whole, filling the pots and the spaces between them. This is well watered and firmed, making sure all is level on the surface. Then as you prepare a pot of cuttings, you need only remove one of the pots of sand and set the pot of cuttings in the hole.

My tools for taking cuttings are a razor blade, a nail, a block of wood and a watering can with a fine rose. I use three inch *clay* pots or four inch *clay* pans, filled with fine sand. These are watered before inserting the cuttings as well as afterwards.

I think it is important not to take too many cuttings at once. The quicker you can trim them and insert them and water them in, the better. I like to use the razor blade to cut the shoots off the plant, rather than using secateurs, which may be easier for woody things, but a clean cut with a sharp knife should be the final preparation if the stem is too hard for a razor blade. Seradix or Rootone are the only rooting compounds I have used. If there are only a few cuttings set them

right against the edge of the pot. A nail or fine stick like a matchstick should be used to make the holes and the whole potful should be watered in and gently tapped on the bench to settle the sand and prevent any airpockets once the cuttings are set.

It seems to be a well established fact that cuttings generally root better round the edge of a clay pot, but in commercial work we fill the pots with as many as we can cram in.

The cutting bench should be regularly checked and any dead leaves or developing flowers removed. In hot weather they must be carefully watched for drying out and when necessary sprayed gently so as to water thoroughly but not wash them out of the sand.

To see if the cuttings are rooted, the rim of the pot can be gently tapped on the edge of the bench while holding it upside down. This must be done carefully so as not to spill everything out if they are not rooted. In some cases, a few may have rooted, especially with conifers, so we have prepared another pot of sand in which to re-set the unrooted ones. The rooted ones are potted on. Plants that are slow growing go into two inch plastic pots, set close together; more vigorous ones go into three inch plastic or clay. The clay pots are placed in a bench or frame where they are sunk in a bed of sand. Our basic potting mix is equal parts of coarse sand and a mineral type of soil from the forest put through a quarter inch sieve. No fertilizer is added, but the plants are fed with a solution of 20-20-20 about three times during the growing season. Shading is provided with lath screens over the frames. In summer every fourth pane of glass is removed from the side of the greenhouse where the young plants are grown on, but not from the propagating house, which has top ventilation and open doors at both ends.

If asked *when* to take cuttings, I should

say, "When the wood is just right", and no doubt this takes some time to learn by experience. Material is usually "just right" when the cutting will bend but not break. At certain times of year there seems to be so much vigor in a plant that cuttings will root rapidly.

Some common things like aubrieta and helianthemum can be most reluctant to root. I find the best cuttings of such plants are those made from the shoots that appear when the parent plants have been cut back after flowering and fed. Then comes the new young growth, which makes the best cuttings and root quickly. Later harder cuttings may take several months to root.

Ericaceous plants such as gaultherias, cassiopes, tsusiophyllum, etc. root very well from cuttings taken here in Victoria in August, but these may not be ready for potting up until March. Dwarf conifer cuttings seem to do well if taken in December, but some may take two years to root. Many people have trouble with dwarf hemlocks, probably because they try to root them in heat. I take cuttings of daphne any time that there is what I consider good young tips, which are not too soft. It does not seem to matter if there is a flower bud included. *Helichrysum coraloides* has to have the bottom scales removed, but *Helichrysum selago* should be left as it is. *Lithospermum* 'Grace Ward' should have the whole tip of the shoot, leaves to the base and all, inserted in the sand. July seems to be when good material is available.

I do not, on the whole, take cuttings with a "heel" as many English books advise, but with most of the conifers I use the razor blade, if possible, to make the cut where the current year's growth joins that of the previous year. Then all I do in further preparation is to remove some of the lower needles.

Haberleas and ramondas can be divided, but it is also possible to take a whole

leaf, petiole and all, and insert it in sand; a new plant will grow from the base of the leaf. African violet fans will be familiar with this method.

Morisia is a good example of root cuttings. Just slice across the top of a piece of root and make a slanting cut at the lower end and set these pieces in sand with the flat end just at the surface.

Lewisias, erodiums and geraniums can be awkward things to work with. Because of the short, thick, chunky bits of rootstock at the base, they are very apt to be knocked out of the cutting pot when you are removing the ubiquitous liverwort from around them.

*Tunica saxifraga*, coming from a central rootstock, is sometimes reluctant to supply good cuttings, but keep an eye open for the young shoots appearing round the crown in the fall or spring. Dryas I have also found difficult. They provide nice tips which are not the easiest things either to root or to grow on in pots, however they can be pulled apart and the rooted pieces treated as cuttings.

Dianthus come quite easily from the tips of the shoots pulled from the plant. Pull off just the end of the shoot which will not disintegrate, losing all its leaves. These are called pipings and in very floriferous plants suitable material is not always plentiful. *Dianthus simulans* comes very easily from tiny pipings, but I find *D.* 'Little Joe' so busy flowering that there are never enough cuttings on it.

The usual mistakes made by beginners seem to be those of taking either too big a cutting, or growth that is too hard or too soft; or being impatient (some things can take two years); letting the cuttings dry out (once is once too often); or giving too much heat.

My experience has been in Victoria, where the summers are dry, but not too hot and the winters are mild and wet, the methods I have described may not work elsewhere. I think, however, that the important thing is to experiment *and* have a place ready, so that when you do find suitable propagating material on your plants you can get the cuttings in without delay.

## THE AMIABLE SEMPERVIVUMS

Sempervivums are of the easiest culture and seldom bothered by insects. The rosettes vary in color as the weather changes and vary in size from species to species; many grow rosettes of considerable size, while others, such as the *S. arachnoideum* types are very small. As alpine plants in the wild, they are very suitable for the rock garden, but need careful placement to look their best.

I have tried them in a number of sites, in some with great success. It is easy to pull them out of any spot where one decides they do not look well.

I have *S.* 'Cherry Frost' growing in a crevice just above the dwarf iris 'Cherry Spots' and these two plants compliment

each other when the iris is in bloom. At the top of my wall garden I have a piece of drift wood and several rocks. Here I have planted my *S. arachnoideum* types along with sedums and saxifrages and this makes a very attractive combination. *S. arachnoideum* 'Stanfieldii' is such a pretty red in spring — a real accent. The carved buttons of *Sedum pilosum* look so like the rosettes of a sempervivum that it is frequently mistaken for a semp. Sempervivums also blend well with cacti.

I have used sempervivums in crevices where they help hold a wall in place as securely as would a rock. One can tuck them in the seams between rocks to make several small rocks look like a large one.



Sempervivums are also nice along the outside edges of steps and by using those that have different color tones and textures, one can create attractive patterns. I have *S. ciliosum* planted around a hollowed rock sunk in the rock garden for a bird bath.

Sempervivums are also frequently planted in cement blocks, strawberry jars and old shoes. This is not for a rock garden.

At one of our plant shows I made a design of the letters "A.R.G.S." using sempervivums planted in a pan of grits. I have tried other designs but they keep sending out rosettes and it takes too much time to keep them in place.

I had seventy-five labeled sempervivum

clones at one time but to keep them all correctly labeled gave my garden the look of a nursery, rather than a natural planting, so I lost interest in keeping them all labeled. Though I have consequently lost track of some, I know my favorites by name. They have increased so much by making new rosettes that I am forced to give many away.

There must be others who grow sempervivums in their rock gardens. Articles on how to grow sempervivums in a natural setting would help all who are interested in these lovely plants.

—Madalene Modic  
Sewickley, Pennsylvania



### ALPINES OF THE AMERICAS

The report of the First Interim International Rock Garden Plant Conference, 335 pages of text and 37 pages of Index, 92 color photographs on 30 pages, 12 black and white photographs, 5 line drawings. Edited by Sharon (Sherry) F. Sutton, Northwestern Chapter, ARGS, \$15.95 plus postage (soft cover). Copies available from Mrs. John S. Kistler, 1421 Ship Road, West Chester, Pennsylvania, 19380.

This compilation of the papers presented at the First Interim International Rock Garden Plant Conference, jointly sponsored by the ARGS and the Alpine Garden Club of British Columbia, provides an invaluable summary of the state of the

alpine gardener's knowledge and cultural capabilities in 1976 as they relate to the alpines and woodland plants endemic to the Americas. It contains information not available elsewhere on many of the primarily American alpine genera and it is presented, as was the case with the conference, with the comprehensiveness that the subject deserves. It was worth waiting for.

Sherry Sutton has done a fine job of editing and, where necessary, combining the written papers presented by the speakers and their tape recorded talks so that the maximum of information is available to the reader.

The contents can be broken down into

several main categories: A review of selected North American genera; a look at South American plants; a summary of certain uniquely American edaphic situations (i.e. special soil and climatic conditions); American rock garden hybrids; American plants of tectonic (i.e. structural) appeal; American plants in cultivation throughout the world.

In addition to these broad topics, each of which covers a number of individual papers, the report contains the key lectures and conference proceedings that were interspersed throughout the eight day session including a description of many of the superb displays, a summation of the visits to private gardens and a pot pourri of many individuals' reactions to the mid-conference field trip to Mount Rainier. For added seasoning a smattering of individual comments have been dispersed throughout the volume that should convey to the reader who was not an attendee a bit of the flavor of the event.

The report does not contain any description of the pre and post Conference tours nor of the material already published in the Conference program booklet and Plant List. While the limitations of space can be appreciated it is a shame that the talks by Dr. Julian D. Barksdale on Washington State's Geology and of Jean G. Witt on the Floral Diversity of Washington's Life Zones could not be included in the Report since they were both highly relevant to the conference.

Some of the outstanding papers presented in this report are: Sorting out the Fine Phloxes — H. Lincoln Foster; Uncomplicating the Penstemons — B. Leroy Davidson; Collector's Ericaceae — Sallie D. Allen; Liliaceous Bulbs — Wayne Rodrick; All the Rest — Robert Woodward; Bulbs of South America — Robert Woodward; To Have and To Have Not — John M. Watson; Plant Hybrids: A Botanical View — Arthur R. Kurckeberg; Alpine Botany: Just for the Walk — B. LeRoy

Davidson; The Alpine Plant Communities of the Southern Rocky Mountains — Ann H. Zwinger; American Plants for the Woodland Garden — H. Lincoln Foster; Terrestrial Orchid Culture — Frederick W. Case, Jr.

And there are many, many others of interest: a group of papers outlining the cultural *raison d'être* for the plants that grow on barrens (pine, shale and limestone) and on tundra, pumice craters and prairie; a symposium on the superb trough plantings where individual troughs displayed choice plants endemic to each of the Beartooths and Big Horns, Wenatchees, Cascades, Siskiyou, Olympics, Northern and Southern Andes and other ranges.

The color photographs are outstanding and of the highest quality and the Index is most useful. In fact the only weak portion of the report is the section devoted to Garden Visits where the descriptions are quite unevenly presented; some gardens receiving detailed and well-done assessments and others the most casual of treatment — clearly not up to the standard of the rest of the report. The space devoted to Garden Visits could well have been used to better advantage, given the peripheral nature they played in the Conference.

The report is a must for any serious rock gardener who will undoubtedly wish to give it the closest scrutiny and who will find many rewards in it, not the least of which is the engaging prose of Panayoti Callas whose reactions to the Conference salt the report. There are many apt comments in the book. Two that caught my attention were:

"As a free-lancing collector, I feel somewhat vulnerable to a *modification* of Oscar Wilde's famous and wicked epigram of fox hunting — in my case the *unemployable* in search of the *ungrowable*." — John Watson on the more difficult Andean alpinists.

"The First Interim International Rock

Garden Plant Conference was an experiment whose time had come. It was well worth the effort. We urge that there be other interim conferences and hope that the first will set a precedent for the future. We also urge that they be held somewhere else, at least for a while." — Joseph A. Witt, Co-Chairman for the Conference.

Mr. Witt and his colleagues deserve our grateful thanks for the excellence reflected throughout the conference and embodied in this handsome publication. For those who were there, the report will evoke many memories both of the conference and the alpine in the Cascades and Olympics. For those who did not attend the report will not only transport them to that special corner of North America but will edify and entertain them as well. F.H.C.

## HANDBOOK ON ROCK GARDENING

Brooklyn Botanic Garden Record, *Plants & Gardens*, Vol. 36, No. 2, Summer 1980 76 pp. Brooklyn Botanic Garden, Brooklyn, N.Y. \$2.25 plus .60¢ postage. Also available from your ARGS store.

When *The Rock Gardening Handbook* of 1965 went out of print a couple of years ago, it became necessary to replace it so that the Society would have some work to which to refer the aspiring neophyte. That this replacement appears as an issue of *Plants & Gardens*, the much admired and widely read periodical of the Brooklyn Botanic Gardens, can only be a gain for us, — at least if we want our society to grow.

The editor and associate editor for the BBC were Frederick McGourty and Margaret E. B. Joyner. The guest editor was our own Marnie Flook, who clearly set the tone for the whole enterprise. She wrote, or collaborated in, three of the main articles, and supplied many "fillers" — all

useful and interesting.

The Handbook of 1965 was an anthology of articles written for the *Bulletin* during the previous two decades. They were all solid pieces such as studies of a *genus*, e.g., "Penstemons suitable for the Rock Garden," or guides to the culture of an ecological group, e.g., "Bog-gardening." It was no doubt valuable to beginners, but it was also a valuable reference book for more advanced gardeners, and I think we all came to know its contents very well.

The Handbook of 1980 consists of pieces commissioned from twenty-five of our more distinguished members to serve a firm editorial purpose. That purpose was to meet the needs of the beginner. I first understood this when I thought about Marnie's comments on *Lewisia cotyledon*. She seems to apologize for including it because it is more difficult than the other plants she lists. Clearly her purpose is to set her readers on a course where failure is virtually impossible. It is important that this be understood. Otherwise, the more advanced reader may ask himself what kind of Handbook is this that doesn't even mention *Gentiana verna* or *Dryas octopetala* or a host of other favorite plants.

Perhaps the title is misleading. Should it not read "Introduction to Rock Gardening?" "Handbook" suggests a reference book. Be that as it may, once its purpose is understood, the most advanced gardener will read this work with delight and profit as he follows the elegant design from introduction to site-preparation to lucid advice on planting and care, and on propagation. The mid-section lists plants for sun, plants for shade, low shrubs, annuals and bulbs. The final twenty pages or so introduce the reader to what must be a delightful city backyard rock garden, to raised beds and troughs, to a tufa garden and scree, to Alpine and pit houses, and to the bulb frame.

By the time our neophyte has built his

alpine house, made his raised beds, planted his scree, and learned how to manage his bulb frames, he will have far outgrown a plant list in which *Lewisia cotyledon* is too advanced. By now he will be growing the new Asiatic androsaces and pursuing the fabulous colored Himalayan diaspensias.

To read this book is to hear dear friends again and to be introduced to new ones. It is a delight. —H.P.

## ROCK GARDENS

by Jerry S. Stites and Robert G. Mower. Information Bulletin #159, Extension Publication of N.Y. State Coll. of Agriculture and Life Sciences. Cornell Univ., Ithaca, N.Y. 29 pp. \$3.00.

A surprising amount of no-nonsense in-

formation is contained in these 30 pages. It is good to have it available and should be useful to many. I do not, however, think it necessary for such of our members as possess a minimal horticultural library to buy it.

Sixteen of the pages are devoted to a list of fifty common rock garden plants. There is a small color photograph, sometimes with an even smaller enlargement to show detail, of each. They are excellent.

I have two complaints, both involving the saxifrages: 1) the quite illegitimate popular name "Rockfoil" is used, and 2) the illustrations for the mossy and encrusted Rockfoils (ugh!) have been transposed. Otherwise this is an attractive publication, well-written and well-presented.

—H.P.

## NOTES FROM ALASKA

HELEN A. WHITE  
Anchorage, Alaska

### BACKBONE OF THE ROCK GARDEN

Someone has called saxifrage "the backbone of the rock garden." If that is true, Alaska has a backbone of considerable extent. *Saxifraga* in the north is varied and one species or another covers the arctic and alpine regions of the state. We have some two dozen species which make their home in Alaska — more counting the several subspecies. Colors are white, creamy, yellow or red-violet. Some kinds are matted or tufted and others are loose-leaved. The height may be anywhere from half an inch to one foot, depending on the species and the locality in which they are found. The foliage of some sorts is edible and was used extensively by the Eskimos at one time; those living in remote places still do. They are a good source of green stuff during the winter if preserved in seal oil.



*S. bronchialis*

My favorite saxifrage, perhaps, is *S. bronchialis*. Both subspecies are neat matted plants. The creamy flowers, liberally dotted, rise about four to six inches above the densely packed, hairy-edged leaves. *Ssp. funstonii* ranges over much of Alaska and neighboring Siberia, while *ssp. cherklerioides* is more limited in both Alaska and Siberia. In Alaska it is found mostly in the south central part of the state and in the westernmost Aleutian Islands. The

Spotted Saxifrage is a good subject for the home rock garden though portions of the spreading mat have a tendency to die out at times and pruning must then be ruthless. This saxifrage does not grow well in calcareous soil.

Following are listed *Saxifraga* that find Alaska to their liking. Those starred are the more wide-ranging and several are circumboreal.

*S. adscendens*  
*aleutica*  
*bracteata*  
*bronchialis* (2 ssp.)  
*caespitosa*\*  
*cernua*\*  
*davurica*  
*eschschoitzia*

*exilis*  
*ferruginea*  
*flagellaris* (2 ssp.)\*  
*foliolosa*\*  
*hieracifolia*\*  
*hirculus*\*  
*lyallii*  
*mertensiana*  
*nivalis*\*  
*nudicaulis*  
*oppositifolia* (2 ssp.)\*  
*punctata* (5 ssp.)  
*reflexa*  
*rivularis*\*  
*serpyllifolia*  
*spicata*  
*tricuspidata*\*  
*unalaschensis*

## Those Tantalizing White Forms — An Update

ROY DAVIDSON  
Seattle, Washington

Reminiscences of some white flowered plants (Bulletin, Vol. 36, p. 12) really calls for a sequel in order that the reader-gardener be brought up to date. Mrs. Sherard stated (1940) she had no knowledge of white flowered *Penstemon rupicola* nor any white *Synthyris*. While not exactly common today, we do have two distinct forms of the latter, while the former is now a well regarded commercial plant known far and wide.

Almost any blue or purple or rose flowered species can occasionally give forms that are colorless or nearly so, as too may some of the red flowered ones; Mrs. Sherard mentioned *Gilia aggregata*. We also have white (or ivory) *Zauschneria*, white or ivory (or palest carrot-orange?) *Penste-*

*mon neuberryi* and probably others in this category.

Not only is there the over-large *Penstemon cardwellii* called 'John Bacher' but also the newer and far tidier albino found by David Every on Washington's Mount St. Helens pumice and there is Lohbrunner's *P. fruticosus* ssp. *scouleri* 'Alba' found in British Columbia and possibly the finest of all white forms in the genus. "Precarious" forms of *P. davidsonii* and its subspecies *menziesii* are known to a few specialists skillful enough to keep them and even clever enough to flower them. It is likely that over-feeding and frequent propagation might eventually allow a seed strain among these shrubby albino penstemons with inherent hybrid vigor,

and Bruce Meyer is working toward that end.

The striking little white spikes of *Synthyris stellata* 'Alba' have been found once in the Columbia Gorge and the plant is among the easy ones, while quite a number of reports of white *S. reniformis* establish that entity as fairly frequent in nature. Each spring several seedlings of it appear on my sheltered bank.

In addition to white *douglasiana* and *tenax* among Irises — the latter rather commonplace if ten in one day can be sighted by keen albinist searchers — there is the snowy *I. innominata* 'Star-bright', found by Izetta Renton and from which she has raised improved forms with better shape and broader segments, thus showing the advisability of self-pollinating these rare white finds, not only to increase their numbers, but to improve the quality. White *I. missouriensis* may, however, be the most beautiful of all the western irises; my own discovery named 'White Canary' has given very good white seedlings.

White lupines are mostly too large to be considered for the rock garden. Mrs. Sherrard spoke of *L. lyallii*, now known as *L. lepidus* ssp. *lobbii*, and a white form of the subspecies *aridus* is of recent record. It may be expected to be an easier one to grow; it hails from the arid Blue Mountains of Oregon-Washington.

Dr. Ownbey recorded growing no less than three separate *Dicentra eximia* albinos, one of which was, of course, the well known 'Sweetheart'. (Currently considered a white form of the western *D. formosa* — Ed.) This one appears to be subject to diminished vigor after so many years (perhaps thirty-five or forty?) of cultivation from division. Another vigorous clone needs to replace it unless it can be induced to give white seedlings, which it apparently never has done. Although seemingly most hearty when first known, this decline of vigor is typical and

is frequently considered a serious shortcoming of the albino condition in general among plants. (Perhaps *D. eximia* 'Snow-drift' will serve as a replacement. This clone did produce a number of white seedlings when planted near a typical plant. These seedlings were segregated and now invariably produce white flowered plants when intercrossed. See p. 15, Vol. 36. — Ed.)

Some few years ago it was my pleasure to record a number of these albino occurrences under the collective title "The Rare White Form" in the bulletin of the Alpine Garden Club of British Columbia, including some of their biographies. To this our late editor, Merle Sutton, responded with some of his own experiences, adding to the list *Veronica cusickii* and *Douglasia laevigata*. I am not aware if either has been established in cultivation.

Since that time I have made other "discoveries" of albinos. Although having been party to a rediscovery of the aforementioned lupine, another two have been less personal experiences. There have been several exciting finds of white *Lewisia cotyledon* in its various subspecies, and from them have developed seed strains of superior merit. In the Scottish nursery still to be known by the founder's name, Jack Drake's, I was overwhelmed in 1974 by a stock of pure white *L. tweedyi*, and a plant came back with me. Now white *tweedyi* has been recorded in prior times, but from this importation it has become at last well established in American horticulture. The original Drake plant was raised from seed supplied by Charlie Thurman from garden grown plants derived from a few rooted cuttings coaxed over a period of years to yield quantities of seed; yet this was the only albino recorded from that source. Thurman's advice to remove all side growths as cuttings and to maintain a single crown as being the sure way to

keep it growing (beneath a big flat rock) is worth passing on here. Yes, the gorgeous peach *tweedyi* is lovely, and so is the cool lemon; I can't say as much for the rose ones, and perhaps only a nut would want them *no* color. (The albino is very beautiful, however, even though the petals are thin, seeming to radiate a moth-wing iridescence.)

Discovered in my own garden was an unsuspected and unremembered white *Dodecatheon* — how could this be? Inquiry disclosed that Dale Douglas (who

lived on the property while a student on a nearby campus) had brought it, and it has now been grown to a small colony and identified as an albino *D. jeffreyi*; though it should be fertile, no seed has resulted to date. *D. meadia alba* will not stay with me; perhaps this will.

At long last I have found a true albino *Calypso*. Because the land was being logged, it was carefully taken and given to the care of a superb plantsman, one far more likely to succeed with it, but it survives only in its superb portrait.

## WHY DO WE DO IT?

FRANCIS H. CABOT  
Cold Spring, New York

Goethe reflected that the gardener has a two-fold relation to nature: he is at once her master and her slave. He is her slave "in-as-much as he must work with earthly things in order to be understood; but he is her master, in-as-much as he subjects these earthly means to his higher intentions and renders them subservient." Had Goethe been an alpine plant enthusiast he would have undoubtedly used the phrase, "tries to render them subservient."

Taylor Whittle in his book *Ancient Gentlemen*, lays it on the line by stating that the moment we become gardeners we make a robot which will ultimately control us. Why do we do it? There are many theories.

I like to think that we as rock gardeners have always known instinctively the importance of what behavioral psychologists and sociologists are discovering and calling, in the ghastly jargon of their profession, the non-physical plant-people imperatives.

Charles Lewis tells us that some scien-

tists explain aesthetic preferences for landscape in terms of its ability to provide "refuge, a place where one cannot be seen, or in terms of its prospect, a place where one can view the surrounding area." In other words that which enchants us is merely an evolutionary reflex from the one hundred million years during which we found places where we could elude the charging mammoth or entrap it and survive. Nature, in an optimum human environment then, is not a decorative amenity but an essential biological need. Is that why we build and labor in our rock gardens? Is that why we feel exhilarated as we sit high on an alpine meadow or scree and drink in the unfettered space and sights around us?

Or is Taylor Whittle right? He has a theory that gardening is such a highly personal art that it is irresistible to egocentrics — an interesting thought. The word is used in its broadest, most correct sense and is not to be confused with egotist. It includes not only those of us who are normally and naturally self-centered

but also those of us who have been made self-centered by circumstances — those of us who are lonely, timid, shy; those of us who have a crying need to express ourselves in some art form or other; and especially, those of us who are ostriches, who are only truly happy when we escape from the bewilderments of daily life by burying our heads in an interesting, well-ordered, preferably beautiful and, *most importantly*, well drained piece of gritty sand into which a modicum of humus or

leaf mold has been incorporated — ostriches, who use their garden as a refuge — much as a painter uses canvas — as an area to be decorated according to their aesthetic taste.

Well, mammoth hunters and egocentrics all, we are what we are and there is not much we can do about it, so let us, despite the whys and wherefores, get on with the enjoyable business of cultivating our gardens.

## . . . of Cabbages and Kings . . .

An artist friend, for whose wife we were building a rock garden, after watching us from his studio window as we carefully placed and replaced each rock and deliberated over the position of each plant, came out to tell us that he had not realized how similar was the building of a rock garden to the painting of a picture.

"Perhaps," we replied, "but unlike your pictures, ours will change. We can only hope that it will eventually become what we now see in our mind's eye."

"Doesn't it upset you to know that all your hard work and meticulous planning will change in ways you can't control? It would certainly bother me to know that the lines I draw will probably wander off on their own and the colors slither to some other spot on the canvas the moment my back is turned."

This is, of course, one of the challenges and frustrations of designing a garden. Though one may try, as one builds and plants, to see the garden not as it is but as it will become, there is no assurance that this hope will be fulfilled. Yet for one who lives with a garden, this has its compensations; one of the true joys of a garden is its dynamic dimension. Unlike that of a

painting, the aspect of a garden is never static. It varies every hour as the shadows ebb and flow across it and the sun's rays highlight first one group of plants and then another; the very quality of the light from moment to moment will alter its appearance. As each week passes the color combinations shift as new flowers come into bloom and others fade. Each season displays a new mutation, from the tentative greening of spring to the swelling flood of verdure and blossom in summer, from the climax of saturated brilliance in fall to the gradual softening of hues as the foliage shreds away to reveal the stark patterns of winter. And as the years pass, the patina of age brings to a well cared for landscape a rich beauty that a newly made garden, no matter how carefully laid out, can never have: a more subtle blending of texture and color as mosses and lichens soften the harshness of stone, as trees and shrubs outgrow their gawky adolescence and fit their shapes to each other and their surround and flowering plants spread among their neighbors and self-sow into combinations more delightful and appropriate to their character than man can devise.



But this very insistence on growth and proliferation, which plays such a large part in this kaleidoscopic loveliness, can also dramatically change the effect originally intended for the worse as well as for the better if left uncontrolled.

Though planning for future growth (the first commandment promulgated to every would-be garden designer) is probably advisable, it is certainly not the complete answer. Plants are living things and seldom cooperate in fulfilling completely the design one hopes to achieve. They not only get larger as they age, they frequently lose their shape. Stems and branches may unexpectedly shoot out at unseemly angles; indeed, a shrub or tree, treasured as a focal point, may be smashed out of all recognition by a single storm. Though some plants may burgeon with unwonted vigor, others pindle. Thin spots appear in textured sweeps of ground covers; the carved contours of crowding saxifrage rosettes, so tightly wedged and humped in their fissures as to almost resemble the stone itself, develop brown spots that spread and crumble away, leaving unsightly gaps in the perfectly mounded cushions. Some plants inevitably die. And gradually the design loses its integrity.



Science tells us that without plants we would soon find we could no longer breathe for lack of oxygen. Weeds and gentians may equally refresh our lungs, but gentians also refresh the soul.

## GREER GARDENS

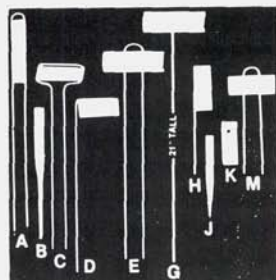
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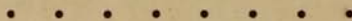
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