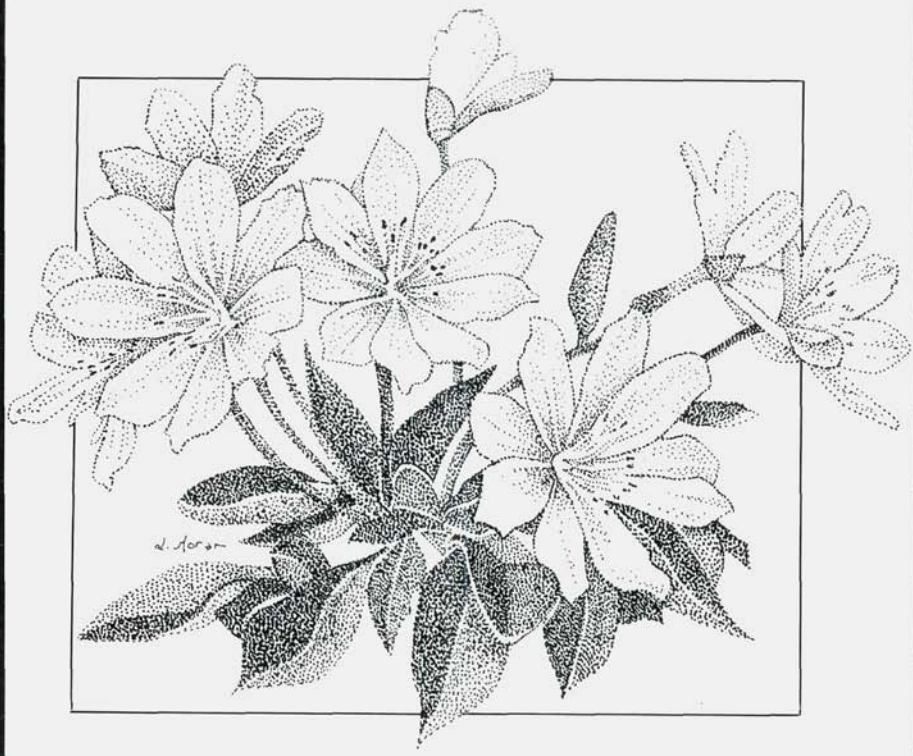
Bulletin of the

American Rock Garden Society



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CALENDAR OF COMING EVENTS

Annual Meeting (Connecticut Chapter)
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Hartford, CT
Eastern Winter Study Weekend (New England Chapter)
Sheraton Tara Hotel . . . . . January 29–31, 1988
Framingham, MA
Western Winter Study Weekend (Western Chapter) 1988
Annual Meeting (Columbia-Willamette) 1988

Cover picture: *Lewisia tweedyi* introduces the delightful work of Lisa Moran of Lauderdale, Minnesota, who has become our first producing volunteer artist.

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Bulletin of the American Rock Garden Society

Plants of the Bucegi Range

Mojmir Pavelka
Novy Jicin, Czechoslovakia

The Carpathians as a mountain system form the backbone of Eastern Europe. They reach in a great sweep from the mountains of Slovakia and Under-Carpathian Ukraine to the eastern part of Romania. The central section, on Romanian soil, often called the Transylvanian Alps, consists of many mountain ranges which host a wealth of interesting plants. Here we find many plant species, known to us from the Alps and Tatras, and it is here a number of alpine plant families have their purely local counterparts—endemics.

The most accessible of the ranges is the Bucegi, formed by a plateau 2000 m high. On the west from north to south are the peaks of Furnica, Piatra Arsa, Jetii Mici and Jetii Mari, and finally Caraiman; to the north the whole range is closed in by the mountain Omul, some 2500 m high. To the west

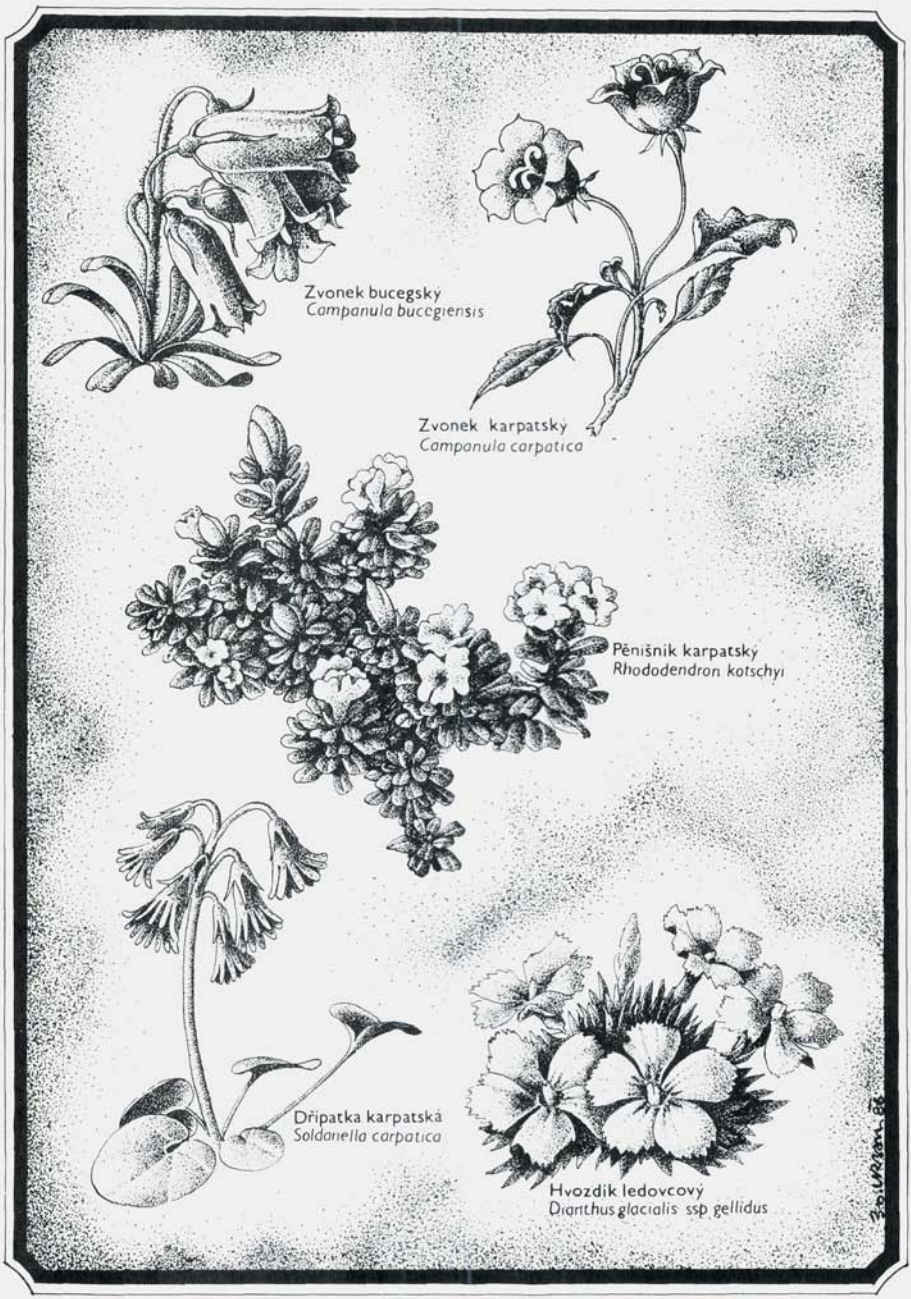
the land rises gently from the plateau but on the east falls in sheer cliffs to the River Prahova. The river bed is followed by a railroad and a highway from Brasova to Plojesti. Our region of exploration is staked out by the Predeal station to the north (situated at the highest elevation of this tract) and Sinaia to the south. Both are express stops. From Sinaia the summit of Furnica can be reached by a cabin lift of Italian construction, and from there the entire plateau is accessible as far as Babele by a decent road, originally constructed for a high mountain sport resort on Piatra Arsa. Geologically it offers a highly diversified formation from a striking triassic white and gray striped limestone on Caraiman and in the valley above the village of Busteni to an acid conglomerate scattered all over the region. This sustains a very colorful vegetation.

The northern area of Bucegi, in the vicinity of Caraiman, is readily accessible from Busteni (both railroad and bus stop) by a new lift built in the late '70s, over the ridge on the southeast side of Caraiman where stands a tourist lodge (Cabana Caraiman) all the way to Babele, a most characteristic mass of solitary conglomerate and the site of yet another lodge.

For us the more interesting ascent is by a tourist trail from Busteni through a gorge following more or less the route of the cable lift. Already at its base in meadows between beech woods we meet masses of *Gentianopsis ciliata* (European counterpart of *G. crinita*), known to us not only from the Czech Stredohori but also from the lime outcrops of Slovakia, and a flood of *Colchicum autumnale.* In moist and shadier wooded areas and clearings along the streams are dominant inulas, related to the robust *Telekia speciosa,* growing up to 150 cm, with large heart-shaped and unevenly serrated leaves and large golden yellow flowers lasting well into late summer, attracting hundreds of Admiral butterflies. Nowhere will you see them in such profusion.

Higher up, the numbers of interesting alpines increase. Common in forests here just as in Czechoslovakia is *Gentiana asclepiadea,* next to the local species of *Spiraea* with its small grayish leaves. On limestone rocks and conglomerate outcrops we frequently see *Campanula carpatica,* mostly in richer purple-blue tones than in our gardens, together with the everpresent *Asplenium ruta-muraria.*

In the woods and at the foot of cliffs and rocks grow *Soldanella carpatica* and a local species, *Hepatica transsylvanica* with its nine-lobed leaves. Among the rocks, with increasing height stand the yellow-green, dense, hairy heads of *Saxifraga luteoviridis.* Not tolerant of full sunlight, it chooses lighter spots in damp crevices in limestone and stabilized grit. It is not difficult to cultivate, does well in tufa, is an eager bloomer, self-seeds in time, and sets seed abundantly. Often we encounter *Saxifraga demisa,* related to the more common alpine, *S. mutata* which also grows in one location in Slovakia. *S. demissa* has flat widespread rosettes of lanceolate green, not silver, leaves.



Zdenek Urban

Flower heads are muddy yellow as in *S. mutata.* It is monocarpic as the *S. longifolia* from the Pyrenees; the mother rosette dies down after bloom and seed formation, making only a few side shoots, yet it sets seed abundantly.

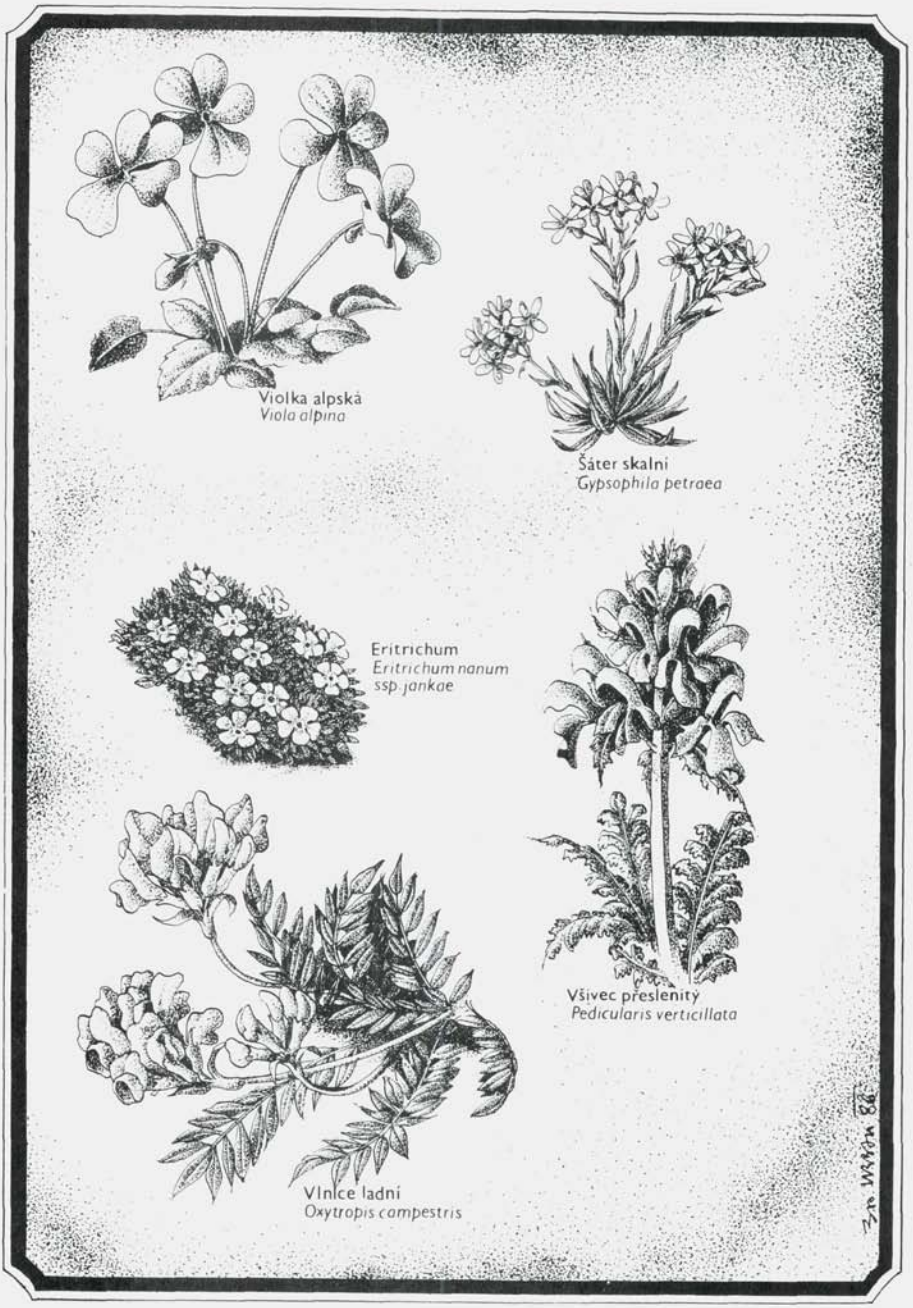
As the road ascends, there are visible traces of avalanches, of trees and shrubs often damaged. Even these become scarce and are finally replaced by *Pinus mugo.* Scattered among their colonies is low turf where in protected places we again encounter soldanellas, and the recurring *Primula halleri (P. longiflora*). From far away we see stems of *Gentiana lutea* up to 150 cm high. Widespread in the Alps, in Czechoslovakia it is replaced by *G. punctata.* All around on scattered rocks is *Saxifraga luteoviridis* in ever increasing profusion.

An endemic which grows in sunny crevices of dry rocks is *Gypsophila petraea* (*G. transsilvanica*) with gray linear leaves and flowers condensed in terminal half-circular heads of white or faint pink. In the garden placement should be similar: lots of light, or it will lose the lovely compact growth and become straggly.

In the immediate vicinity of the chalet, in addition to other noteworthy dwarf shrubs, grows *Rhododendron kotschyi,* a Carpathian endemic and close relative of the alpine *R. hirsutum* and *R. ferrugineum.* These gorgeous shrubs reach 20 cm at the most, on exposed sites more often only 5 to 10 cm. They are literally everywhere, mostly on the northern and eastern slopes. In September many are still covered with reddish-pink flowers, glittering from afar. This plant is not often found in cultivation. Specimens transplanted into gardens are shy to bloom. To grow a mature plant from seed is a slow process. The seedlings are very small the first 2 years and grow at a slow rate thereafter, requiring a cool but very light place, evenly distributed moisture, besides the mandatory acid soil with peat.

The surrounding alpine meadows with their rocky outcrops hold some real treasures. Alongside *R. kotschyi* almost invariably grows *Loiseleuria procumbens,* but it rarely stands alone. It exists in large formations, not more than 5 cm high. Often when in sun the minute leathery leaves have a reddish cast. Almost everywhere are mats of *Silene acaulis.* Frequently on a single plant we can photograph a mass of flowers—and collect seed. On the mountain plain, with vegetation not unlike the northern tundra, we meet our well-known *Primula minima* and catch in time the last flowers of *Geum montanum (Sieversia montana).* Another golden-yellow plant still in flower is the small *Potentilla ternata,* reminiscent of *P. aurea.* It does well in gardens.

In moist places such as rock crevices, as well as on stabilized gravel, we meet the carnivorous *Pinguicula alpina coby.* The whitish flowers with their distinct yellow spots have long since been replaced by seed pods, and these sans seeds.



Zdenek Urban

In low turf frequently occurs *Lloydia serotina*; a local strain of spring gentian, *Gentiana verna* spp. *alata; Oxytropis campestris,* with silvery, tight alternate leaves in compact clumps; *Armeria alpina; Gentiana kochiana,* closely related to the popular, much-cultivated G. acaulis; various forms of pedicularis; the local counterpart of *Campanula alpina,* but of lighter purple; and also the monocarpic *C. bucegiensis. Dianthus glacialis* spp. *gelidus,* a difficult-to-cultivate local endemic, is already past bloom.

It was almost impossible to find seed of any kind, thanks to the grazing sheep. Only on rocks inaccessible to them was it possible to gather *D. glacialis* spp. *gelidus, Androsace chamaejasme, A. villosa,* and *Pedicularis verticillata.* Here also grows the well-known *Salix reticulata.*

The very pretty, ground-hugging *Viola alpina* blooms in spring with unusually large bright purple flowers, happy among rocks and low turf with other alpines, growing most prolifically on Furnica. Undoubtedly it belongs to the best of the genus. In gardens it grows well in travertine or in humus soil rich in grit. Much sought after by snails, a whole plant can be liquidated in one night.

The real treasure of local flora is no doubt *Eritrichium nanum* spp. *jankae,* a local endemic. The typical *E. nanum* is an adornment of the Alps. It grows almost exclusively in crevices and rock cracks in open cool locations exposed to high winds where even in winter the snow is blown away. The dense, tight clumps are low with fine hairy projectiles, the flowers as in forget-me-nots of the brightest blue sky.

Much has been written about the cultivation of, or rather the attempt to cultivate, eritrichium. I cannot claim long years of experience; it has been only in the last 3 years that I have raised eritrichium. In my opinion it is best to plant in tufa. Most suitable for transplanting are 1- to 2-year old seedlings, although older specimens may be worked with. These are planted into small openings drilled about 2 cm wide and 5 cm deep into tufa, preferably into a slanting or vertical wall, the roots firmly packed in and watered until about a month after planting.

The challenge is to make the plant flower. In this I succeeded only once, but in the opinion of a friend, Josef Jurasek from Prague, who has been successfully growing eritrichium for several years, it is an obliging plant if given the right setting. With this I fully concur. Taking the conditions of its natural habitat into consideration, it seems that this plant of cool and dry climate, in order to set flowers, needs a period of dry rest at the end of summer.

Many other distinct and equally beautiful plants grow in the rock crevices: *Dryas octopetala, Saxifraga oppositifolia, S. moschata,* the common *S. paniculata,* and the diminutive *Gentiana orbicularis,* similar to the spring gentian. Just as eritrichium, this gentian never grows in turf in competition

with other plants. It does quite well in gardens in slightly damp soil with coarse sand or tufa.

In moist humid meadows almost at the summit of Caraiman at an altitude of about 2380 m in the low turf around the well-known monumental cross and TV tower grows the lovely local *Senecio capitatus* spp. *leiocarpus*. The rosettes of prostrate, densely white-haired leaves are half hidden in grass, stems rising to only 10 cm, with attractive flower heads of bright orange. It grows well in cultivation, but is yet another snail favorite. *Leontopodium alpinum* is represented here by the local *L. alpinum* spp. *bucegiensis* with leaves greener on top than the alpine varieties and quite narrow, under clusters of silver-gray flowers.

On the steep eastern slopes grow *Oxytropis jacquinii* with gray-green alternate leaves and very clear rich blue-purple flowers. If given good drainage, it grows and flowers well. It is considered often only a subspecies of the slightly more robust *O. montana* from the Alps.

From the peak of Caraiman, from the cross which reigns over the whole wide countryside, there is a splendid view of the surrounding mountain range including Mt. Omul which in itself is another botanically interesting locality.

Fran Lubera

Very recently the society lost one of its old friends with the passing of Fran Lubera. The New England Chapter is especially saddened with the loss of one of its most loyal and enthusiastic members. Those of us who had the good fortune to know and love Fran will remember her willingness to serve at a moment's notice at show and sales tables, her helpfulness in recording various procedures, and her enthusiasm over some remarkable plant she had brought to show and share. We will miss her sense of humor, her eye for the good plant, and the support she gave to one of our important functions, the show bench. In remembering persons such as Fran it occurs to me that she epitomized one of the great pleasures of membership in the society: that of forming new and strengthening old acquaintances whose common bonds are plants and gardens. Her generosity, good will, and helpfulness will be missed by all her friends. Our great sympathy goes to her equally loyal cohort, her husband Ed.

— Kris Fenderson

The Disappearing Varieties of *Saxifraga aizoon*

Rex Murfitt
Cobble Hill, Vancouver Island, British Columbia

The saxifrage family is represented in most rock gardens be they large or small, each one boasting at least two or three of the many kinds readily obtainable. The gray-green rosettes of the encrusted saxifrages are a familiar sight. In favored gardens early spring is greeted by the bright yellow or white of the more durable varieties of the cushion-forming *Kabschia* group. These are followed by mats of red or pink mossy saxifrages that linger, half forgotten in some shady corner.

Saxes, as they are known by most who grow and love them, have been around our gardens for many years, suffering the ups and downs of trend and fashion. Several decades ago British rock gardeners could select mossies from pages of bewildering names and colors. The fashion of the time required they be planted in great sweeps as many-colored carpets. Furthermore there were lists of named hybrids of the *Kabschia*'s silvery mounds describing flowers in many shades of pink, lilac, yellow, rose-apricot, and glistening whites. There were also long lists of encrusted saxes describing species and hybrids of outstanding beauty, some with great silvery rosettes and long arching plumes of pure white flowers. The catalogues always presented the buyer with the choice of many geographic forms as well as other variations of the species. Many of these varieties have gone and probably forever. It is not that they are not desired by gardeners today, but they can be tricky to grow and, if lost, difficult to replace.

Saxifraga aizoon Jacq. (the old name used for many years and employed in this article on older varieties, though it now must be referred to as *S. paniculata* Miller and will be so found in most newer books) usually headed the list with its many forms, sometimes as many as thirty. In the 1940s, when I started my apprenticeship with W. E. Th. Ingwersen, the nursery listed twenty-four varieties; their 1982 catalogue offered only five. What has happened to the others?

Rock gardeners have had plenty to keep them occupied over the last 50 years with the hundreds of new plant introductions to challenge cultural skills. New horticultural products and methods have revolutionized a number of garden activities. Simplifying many of the old time-consuming methods and procedures allows more time for a wider scope—an easy trap for the unwary. At the same time, botanical research advances; reclassification and name changes exert pressure on the older names. With all this happening, something is bound to be overlooked, neglected, even forgotten in the

competition for space within today's smaller garden. When this happens to a particular group of plants, sales dwindle and nurserymen no longer carry large stocks; many may cease to propagate them completely.

One may ask why a few old and probably invalid names describing forms and varieties of a notably variable species could be of any great concern. The fact that many of the plants are irrevocably lost to cultivation may be no great loss to the world of alpine gardening. Many of the newer hybrids between the various silver saxifrage groups may well be more beautiful. Be that as it may, can you honestly say that reading one of Reginald Farrer's books or the journals of the Alpine Garden Society from the 1930s describing how and where a new form was discovered has no effect on you?

To study the detail in the magnificent black and white photographs of a plant which one has never seen, or has seen once in the past but is beyond our reach today, is to me all a part of the romance of alpine gardening. I believe these early rock gardeners and collectors were smart enough to recognize a good form when they saw one. To bring them home, grow them, propagate and distribute them, surely some of them must be worth something to us today. Thanks to the perseverance of a handful of enthusiasts many an old variety is alive and available to those who take the trouble to search for them.

The *Saxifraga aizoon* forms, and to some degree all the silver saxifrages, lost much popularity due to serious misnaming. This state of affairs is readily understandable as many are very similar, at least to the casual observer. The same problem applies to the names themselves; many are so similar in sound and spelling they are easily misunderstood and misspelled. Once into print and then general usage, it is almost impossible to correct errors. Seed exchanges, for all the good work they do, have contributed to the mass of nameless hybrids that bear no resemblance to the name written on the packet. Book descriptions, however good they may be, cannot identify every plant clearly for everyone. Even the growing conditions in different gardens affect the size and color of rosettes. A good photograph will often be more help than a hundred words, but then again there is never a photograph of the one variety you wish to identify.

Saxifraga aizoon in the wild occurs throughout the mountains of Europe up into Norway and the arctic regions and across onto the North American continent. It can be expected that any plant found over such a vast area and experiencing so many climatic and geographical conditions will show many variations. In addition, when closely allied species grow together with *S. aizoon* and its variations, natural hybrids will result. Walter Irving, one of the early saxifrage experts, wrote in *The New Flora and Sylva,* 1928, "Geographic forms show great similarity of habit and colour . . . . There is a tendency to name variations." Naming for subtle differences is not much

value to the gardener, but when a significantly different form is found, it should be named. However, once named and introduced into gardens, it should be considered as a clone and propagated only vegetatively.

The flowers of *S. aizoon* are often listed and described as white; while this is true to a degree, off-white or creamy-white would be more accurate. In some forms the petals are spotted with tiny red dots, some so heavily that the flowers are nearly red. It must be said that in some cases the flowers do not justify garden space, but if the rosette shows good silver encrustation or is a pleasing green and of attractive shape, grow it regardless of the flowers. Good snow-white flowers carried on gracefully arching red stems or pure yellow and red flowers are such a pleasure they should be grown regardless of the rosette.

So much for generalities. What is *S. aizoon* or *S. paniculata?* Where does it fit in with the other saxifrages? What is its value? Why would anyone find it interesting?

First, let us take a moment and clear up the botanical standing. The genus *Saxifraga* is divided into fifteen sections. Each section contains a number of species with close botanical characteristics. Mr. Winton Harding in his valuable monograph *Saxifrages,* an Alpine Garden Society publication of 1970, simplifies a long list of sections for non-botanist rock gardeners by courageously saying, "horticulturally only three sections are outstandingly important." These three contain most of our rock garden favorites: *Dactyloides,* the mossy saxifrages; *Kabschia,* the dwarf cushions; *Euaizoonia,* the silver encrusted rosette-forming saxifrages.

The *Euaizoonia* section is exemplified by *S. paniculata (S. aizoon)* with its rosettes of fleshy green leaves, usually beaded with encrustation, and its saw-toothed leaf margins. Branching stems arise from the center of adult rosettes bearing panicles of flowers just after the initial flush of flowers in the rock garden.

Saxifraga aizoon shares the section with many other species and forms that are equally important and in some cases far more attractive, for example, the lovely silver rosettes of gracefully curving leaves and bold pyramidal spikes of glistening white flowers of *S. longifolia, S. callosa,* and *S. cochlearis* and its forms. I grow and enjoy as many of these as I can obtain, but there is always the challenge of collecting and sorting out the jumbled mass of *S. aizoon.* Old names readily spring to mind: 'Lagraveana,' 'Correvoniana,' 'Balcana,' 'Orientalis.' Hours of reading and study fail to name some of these varieties satisfactorily. The only way I can attempt to help readers come to grips with the task is by first taking the easier ones, those that are quite distinct and easier to describe.

I have paid lip service to correct botanical nomenclature by acknowledging the name change to *S. paniculata;* however, since all the literature predates

this change I will continue calling it by the older name.

Let us start off with *S. aizoon* 'Minutifolia.' Its tiny rosettes put it in a class by itself. It is not slow growing, soon making a silvery mat of tightly compressed rosettes that do not swamp neighbors, and so is safe among select company. A rosette of flowering size never exceeds a quarter of an inch across. The flower stems are about 2 inches high and maintain scale. The individual flowers are termed white (sometimes catalogues flatter it by understatement), creamy-white might be more apt. It is a fine subject for pan culture, or sinks and troughs, and stays a silvery mat on tufa rock. This is a choice little plant worthy of inclusion in any collection.

The name *Minutifolia* is a good descriptive epithet and is now generally accepted in place of the synonym *S. aizoon* var. *baldensis* which is the name much used in older books. Clarence Elliott in his book *Rock Garden Plants,* 1935, mentions collecting the plant on Monte Baldo beside Lake Garda with Farrer as his companion.

There are two forms easily identified by the color of the flowers, one pink and the other yellow, both colors uncommon among the encrusted saxifrages. *Saxifraga aizoon* 'Rosea' has rosettes that measure over an inch across, averaging between 1 and 1½ inches, depending upon age and cultural conditions. One's first sight of a happy plant of *S. aizoon* 'Rosea' is a pleasant one. The individual rosettes are a blend of silver, green, and red. Uniformly symmetrical and harmonious, the leaves curve outward giving an open look to each rosette. Leaf margins are strongly toothed and edged with silver. Leaf bases blotched with red on the upper and lower surfaces give each rosette a bold red center. Strong stems up to 9 inches long carry the rose-red flowers, each with a noticeable yellow eye. Many writers simply state this form is of garden origin, but Mr. Harding suggests it may well originate in the mountains of Bulgaria where it still may be seen as a wildling.

Saxifraga aizoon 'Lutea' is a lovely form with flowers of delicate sulphur-yellow, also carried on 9-inch stems. Several writers have remarked on what a lovely display the pink and yellow make when planted together. I will always remember how effectively Mr. Ingwersen exploited this combination at the Chelsea Flower Show. The rosettes are quite easy to spot among other forms because they are pale green, dare I say yellowish, not that they are unhealthy as a good one will grow up to 2 inches across. The leaves are distinct, narrow, and strap-like. Silvery encrustation is restricted to a narrow margin along the strongly toothed leaf edges. I do not know the origin of this form but prefer to believe it is a wild collected color form rather than a garden hybrid. The evidence is fairly strong for this belief as many of the whites lean heavily toward creamy shades which is getting close to yellow. I have read of a pale straw-colored form named *S. aizoon flavescens* but have never seen it or heard of anyone growing it.

To help with these notes, I gathered together a 4–inch pot of every aizoon form I had. Among the shades of silver and gray one variety stood alone, not because it was silver, but because it was green, a solid rosette of overlapping broad leaves with prominent truncated toothing along the margins. What little silvering it had was limited to the leaf tips. It came to me from England under the name *S. aizoon* 'Hirsuta.' I have some trouble justifying the name as the only hairs are at the bases of the leaves where they join the rosettes. Young rosettes are produced on strong red–stemmed stolons where this basal hairiness is very prominent. The 6–inch flower stems are slightly hairy, flowers are creamy–white with scattered red spots on each petal. The scant hairiness worries me. If it has to be studied with a hand lens to find, how then can it have the name 'Hirsuta'? The description I have given sounds closer to *S. aizoon* 'Tyrrhenica,' an old synonym for 'Hirsuta.' In this plant, the hairiness is mentioned only in passing and then only on the flower stems. It mentions the particular redness of the outer rosette leaves during the winter months. This is true of my so–called 'Hirsuta.'

While we are in the Tyrrhenican area let me introduce you to another very pleasing variety, one of light silvery–green rosettes, each leaf edged prominently in silver. Each leaf is clothed with minute downy hair on both surfaces, giving credence to the name *S. aizoon* var *hirtella.* Both Mr. Royton E. Heath and Mr. R. C. C. Clay in their books list it as a Corsican variety under the name *S. aizoon* var. *tyrrhenica hirtella.* As with so many choice plants it is not always so easy to manage. I have imported it from England three times, only to have it gradually brown off and fade away. It did not look too happy in some of the nurseries in England when I stop to think about it. Could it be this "hairy Corsican" is not partial to English or Vancouver Island winters? Next winter he goes in the alpine house.

Saxifraga aizoon var. *venetia* from the Venetian Alps is quite distinct and seldom is misnamed. Farrer classes it among the miniatures as it does have small and closely conjested rosettes. The eye is quickly drawn to the mat of dull green leaves with their prominent deep red reverse. Encrustation is limited to the toothing along leaf edges giving to the naked eye the beading effect. Countless young rosettes thrust upward through the compact cushion displaying their red undersides. While this profusion is characteristic of the variety and is part of its appeal, it does tend to obscure mature rosettes. The flowers are a good white and are borne on 2–inch stems, keeping the whole plant in scale. I find, as the flowers fade, if the stems are pulled carefully from the plant, they will bring with them the rosette. The vacant space is rapidly filled with the new rosette, keeping the plant fresh with bright young growth.

The variety *S. aizoon* 'Balcana' is found in many gardens and nursery lists although the chances are that in many cases it will be a hybrid seedling

and not the true plant. Very often the plant grown under this name will have rosettes slightly above average size with dark green leaves and minimal silvering along the leaf margins. Credible descriptions say the true 'Balcana' has small rosettes, pale green with noticeable sharply-toothed edges. Above all it should be heavily covered with encrustation. The individual rosettes are dish shaped, low in the center and higher toward the outer leaves. This is caused by the outer series of leaves being longer and strongly incurving. This tempting description may well account for the popularity of this form. To those who grow for the flowers, the heavily crimson-spotted white petals furnish variety. The name suggests it might have originated in the Balkan Mountains, but the consensus is it is of garden origin.

On the other hand, *S. aizoon* 'Rex,' is one of Reginald Farrer's own collections from the Dossenhorn in 1903. We may read Farrer's own recollections in his book *English Rock Garden* where he describes this silvery find. The true variety is often available today which speaks highly for its durability to have survived in cultivation for over 81 years. The symmetrical and uniform rosettes are of small to medium size, never large. The leaves are heavily toothed and pitted, so much so that the whole plant is noticeably silver overall. Well-branched mahogany-red flower stems rise to 8 inches or so bearing large creamy-white blooms. Farrer claimed it to be a good clear color. It is critical that no red spots whatsoever be present on the petals. It is one of the choice varieties retaining its silvery appearance even under the wet and messy West Coast winter.

Saxifraga aizoon 'Correvoniana' and *S. aizoon* 'Lagraveana' are two old names appearing in saxifrage literature regularly. Some of the authors refer to them as miniatures, classing them in the same size bracket as 'Baldensis,' 'Minutifolia,' and 'Venetia.' To rate this title the rosette may be no larger than ½ an inch across and grow into tight hummocks. I obtained plants of these two from England recently. They are growing well enough but have not flowered to date. If they are to prove themselves to be true to the names, the rosettes must soon stop increasing in size because they are fast approaching the ½-inch mark. I hope they do remain dwarfs as they should make excellent subjects for trough and other miniature planting.

Saxifraga aizoon 'Correvoniana' is named for Dr. Henry Correvon, the Swiss alpine nurseryman who pioneered the cultivation of mountain plants. As long ago as 1885 he listed over 130 different saxifrages in his collection. I am unable to find any details of the origin of this plant. *Saxifraga aizoon* 'Lagraveana' also has its ancestry clouded by the passage of time. It is sometimes mentioned in association with La Grave near Lauteret in the Hautes Alpes; perhaps it was collected nearby.

Reginald Farrer makes several references to the existence of miniature forms, listing a dozen or so. It is an appealing idea to speculate on how many

of them are still in cultivation and whether or not it would be possible to reintroduce them. Take *S. aizoon labradorica* for example, a North American form that came to his attention many years ago. Are there any good forms from this continent grown today?

The forms of *S. aizoon* are all quite easy to grow and are hardy in most parts of the country. An understanding that, despite what we may read, they are not succulents will go a long way in their satisfactory cultivation. They are not sedums or sempervivums and do not relish the hot dry bank so often suggested as the ideal spot. True, in the softer, milder climates survival will occur, but we are not looking for just survival but healthy thriving clumps producing masses of flowers in early summer. No, they are mountain plants of the crevices and ledges, true saxatile plants found growing vertically or nearly so where moisture is quickly shed from the foliage and soil drainage perfect yet with always that deep reservoir beneath. Certainly they will grow in a pocket of soil on a sunny slope in the rock garden where drainage is good and deep root penetration possible. A generous dressing of chips spread under and around the clumps will guarantee protection from heat and drought and prevent unpleasant mud splashing from marring silvery foliage. The ideal location would be in vertical crevices between the rocks that make up the rock garden. Failing these, any crevice is better than none. Here they will find all the conditions favorable and present that real alpine quality to the rock garden.

A good deal has been made of the need to add large quantities of lime to soil mixtures for successful saxifrage culture. Many growers believe generous application intensifies the attractive lime encrustation emitted from the leaf stomata. There are species and hybrids within the *Euaizoonia* and *Kabschia* sections that do demand some lime added to the soil, but *S. aizoon* forms will flourish with or without it. It is generally agreed among growers that the more naturally silvery kinds accept greater amounts of lime. I tend to follow this theory, particularly with pot grown specimens where the addition of ground limestone keeps the soil sweet if it does not increase silvering appreciably.

A word of warning—root weevils will find the root systems, especially in pot grown specimens, eating their way up into the root crown of each rosette. Should this happen to one of your prize specimens, all is not lost. Quickly insert the pieces as cuttings in sand. Root weevils are the scourge of many pot grown alpines. Even *Kabschia* saxifrages are not immune. As a precaution, add Diazinon granules to the soil at the time of planting. Periodic drenching with dilute Diazinon or similar products is well worth the time if the danger of weevils is present.

Germinating Seeds Cold and Hot

Norman C. Deno
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Most seeds germinate at temperatures above 50° (all temperatures in Fahrenheit), but there are some that germinate below 50°. This was forcibly demonstrated in a recent experience with seed of *Iris magnifica.* Seed was obtained from Jim and Jenny Archibald. It was placed on moist paper towels in a sealed polyethylene bag and refrigerated at 41°. On examining the seed 6 months later, it was found that 30% had germinated. Only one was rescued, the others having exhausted themselves in a search for light.

Three other sets of Archibald seed were found to be germinating after 6 months at 41°. Germination with *Lilium albanicum* was 100%, and it appeared that the seed had germinated recently, probably in the sixth month. All were potted in surface sterilized soil (ref. 1), and the cotyledons developed in excellent condition. The germination was of the epigeal type with the cotyledon emerging directly from the soil as a functioning leaf. (Only about half of the genus *Lilium* germinates in this way.) *Douglasia laevigata* had germinated 100% and *Pulsatilla alpina* 30%. Many were too far gone, but about half survived and are in good condition. Germination of the pulsatilla continued on further exposure to 41°. While the above procedure (with more frequent examinations) many not be optimum for the four species, it works and will suffice until more detailed studies are made.

Seeds of the iris, douglasia, and pulsatilla had been obtained in the past with only a rare seed germinating and the rare seedlings were weak and soon died. However, the seeds have never before been subjected to such long chilling periods. The question is whether previous seed might have germinated if given the long chill, and it raises the more general question of complex germinating cycles.

There are three recent books that summarize the large literature on germination (refs. 2–4). Most of the work has been done on food crops, but the general principles arising from these studies apply to the problem of raising rock and alpine plants from seed. Three subjects are of particular importance and these are delay mechanisms for germination, breaking dormancies, and longevity and storage of seeds. Each of these subjects is now briefly summarized.

Delay Mechanisms in Germination

All seeds have some kind of delay mechanism to insure that the seed germinates at times and under conditions favorable to growth. The problem

starts in the seed capsule where there is moisture, but where germination before dispersal would be unfavorable. There are four basic mechanisms which plants use to prevent the seed sprouting before dispersal.

Probably the most common involves the presence of inhibitors which disappear when the seed capsule and enclosed seeds reduce their moisture content and become relatively dry. Thus the inhibitors disappear *before dispersal.* This type of seed is stored dry (orthodox seed) and generally will germinate on contact with moisture. But complexities arise even here. It has been shown in many cereal grains and legumes that germination will not take place unless the moisture content of the seed first drops below a certain level (ref. 2, p. 71). Sometimes the seed must be stored for a time in a dry state. This period is a few weeks with barley but 60 months with *Rumex crispus* (ref. 2, p. 201). There is also the problem of temperature ranges above and below which germination drops sharply. *Allium porrum* germinates at 43 to 68° whereas *Lychnis flos-cuculi* germinates at 68 to 86° and *Cucumis sativa* germinates at temperatures as high as 118° (ref. 2, p. 232). Sometimes fluctuating temperatures give best results as with *Oenothera biennis* (ref. 2, p. 35).

A second mechanism (characteristic of the buttercup, fumitory, and magnolia families) is to have the seed embryo immature at the time of dispersal. This type of seed must be kept moist during storage and is termed recalcitrant seed. The embryo eventually matures under moist conditions and the seed germinates. This type of seed usually germinates erratically over a period of time. It is convenient with this type of seed to wrap it in moist paper towels, place in polyethylene bags, and examine frequently. As the germination proceeds, each seed can be potted up as it germinates. This procedure reduces the space occupied by immature seeds and insures that the seed is kept moist. There is still the question of determining the optimum temperature for germination and of knowing any complex dormancy cycles.

The third mechanism is the formation of a hard seed coat. This usually acts by inhibiting transport of moisture or oxygen, but in some cases it acts as a physical barrier to germination by stopping expansion of the embryo. Germination can be induced by filing notches in the seed coat, scarifying by grinding with sand, or chemical treatment with sulfuric acid. This type of mechanism is found in legumes and some nuts and is not apt to be found in most alpine plants.

The fourth mechanism involves chemical inhibitors that remain in or with the seed *after dispersal.* This type is said to exhibit dormancy, and the inhibitors must be destroyed or removed before germination can occur. The inhibitors may be present in different parts of the seed as demonstrated by experiments in which the seed is dissected. This type is common in alpine plants.

Some seeds combine two or more of the four mechanisms. Others have separate dormancies for the seed, the radicle (root), the cotyledon, and the first true leaf. Some species can produce two or more kinds of seed. In the cocklebur, the two kinds are of different size and shape. The upper seed has a seed coat that restricts oxygen and requires aerobic conditions for germination, whereas the lower seed can germinate in partly anaerobic conditions (ref. 3, p. 55; ref. 4, p. 30). *Chenopodium album* produces four types of seeds, each different in appearance (ref. 2, p. 176). Even in seeds that are similar in outward appearance, half can exhibit immediate germination and half single dormancy as observed in *Primula pamirica.*

Breaking Dormancy

Dormancies may be broken by temperature cycles, biodegradation, light, and chemical treatments. The most common situation is to require 1 month with moisture at 50 to 70°, 3 months at 32 to 42°, and a return to 50 to 70°. This duplicates the effects of fall, winter, and spring and is obviously a survival mechanism for temperate zone plants. The cycle enables the seed to germinate at the start of a growing season. The chilling is sometimes termed vernalization or stratification in reference to horticultural practices used to break this type of dormancy. Although three months at 32 to 42° is generally sufficient. *Crataegus mollis* requires 6 months (ref. 2, p. 202) so that in nature the seed may require two winters to break dormancy. Generally it is a matter of accumulating time at 32 to 42°; time above or below this range does not count. More complex temperature cycles are sometimes required as in *Rumex obtusifolius* (ref. 2, p. 202). Apple seeds have been much studied because different parts of the seed require different amounts of chilling (ref. 4, p. 194). Many rock and alpine plants have the above single dormancy cycle and nearly all temperate zone trees and shrubs have it.

Some temperate zone plants germinate in the fall and overwinter as seedlings. Typical is the English bluebell which requires several weeks at 80 to 87° after which it germinates at 52° (ref. 2, pp. 206, 244). *Lilium philadelphicum* germinates in the fall and the tiny cotyledon overwinters as an evergreen leaf. There are a number of winter annuals such as *Sedum pulchellum* and *Campanula ramossisima* that germinate in the fall.

Peonies, trilliums, and about half of the genus *Lilium* have a complex cycle termed double dormancy. The seed goes through a moist warm cycle in the fall, a chilling cycle in winter, a warm cycle in which the root emerges and forms a tiny bulb, a second chilling cycle, and a warm cycle in which a true leaf emerges from the ground. The cotyledon never leaves the seed case and aborts. Seedlings of this type will usually produce only a single true leaf each year until enough strength is built up to form a stem. Flowering usually occurs the year following a stem. It is no wonder that such species

may take 7 to 10 years to flower. I have observed *Lilium canadense* in shady woodland send up a single leaf each May for decades. Incidentally, the failure of the cotyledon to become a functioning leaf is called hypogeal germination. Although double dormancy is rare in dicotyledons, *Actaea erythrocarpa* was observed to form a root after the first chilling, but the two cotyledons did not appear until after a second chilling.

With seeds exhibiting double dormancy, the time required to produce a plant can be reduced by putting the seed in moist paper towels for a month at 70°, chilling for 3 months at 40° in the refrigerator, holding at 50 to 70° for 3 months to allow the root and bulb to form, chilling for 3 months at 40°, and planting the tiny bulb and root at 50 to 70° when they will quickly form their first true leaf. In this way several years can be compressed into one year.

All fleshy fruits contain inhibitors in the pulp. In nature the pulp is removed by digestion in the gut of a bird or animal or more slowly by decay on the ground. The grower should crush the fruit, remove most of the pulp (usually pulp floats and seed sinks), remove the remaining adhering pulp by allowing it to ferment in water, then follow by a good washing. Such seeds usually exhibit single dormancy in addition to the inhibitors in the pulp.

Dormancies can be broken by heat, but this is more characteristic of tropical plants. Heating seeds of *Mimosa pudica,* the sensitive plant, for 20 minutes at 140° gives seed that readily germinates. A spectacular example is *Albizia lophantha* in which the strophiolar plug is audibly ejected as high temperature is reached (ref. 2, p. 215; ref. 3, p. 53). Moisture can then reach the embryo and germination take place.

Numerous studies have been made on the effect of light on germination and the breaking of dormancies. For most purposes, it is enough to know that some seeds require light to germinate *(Primula obconica)* and others require dark *(Primula spectabilis, Phacelia tanacetifolia).* If a species fails to germinate in subdued light, try dark or intense light.

Dormancies can be broken by excising embryos, chemical treatments, and other exotic methods. These are beyond the scope of most growers and are not necessary since more prosaic methods work.

Longevity and Storage of Seeds

Sensational accounts of the germination of grains from Egyptian tombs, seed encased in arctic ice, and ancient lotus are probably all false (ref. 2, p. 89). However, there are reliable experiments showing that seeds 50 to 150 years old still have high percentages of healthy seedlings. Such examples are largely restricted to legumes. Of more importance to ARGS members are recalcitrant seeds that must be kept moist and which will sprout erratically when kept moist. Perhaps the seed exchange could store these in polyethylene bags, but should moisture be added and would refrigeration

help? These are questions that need study.

Conclusions

(1) The present handling of seed by the ARGS seed exchange is satisfactory for orthodox seed, but members should be aware of the possibility of special requirements for germination such as light or dark, lengthy storage periods, and specific temperatures.

(2) The present handling of recalcitrant and short-lived seed is not satisfactory and much of such seed is distributed DOD (dead on delivery). Not much improvement is possible until storage regimes have been tested and germination behaviors are known in more detail. The Archibalds have been placing seed in plastic boxes with silica gel (for drying) and storing just below freezing, but as they point out, the efficacy of this has not been tested for the vast majority of species.

(3) Much of the seed that has complex dormancy cycles or germinates at cold temperatures does not germinate because of failure to know and understand such requirements. A worthy ARGS project would be for members to choose species which abundantly seed for them and to study storage and germination behavior of such seed in detail.

Additional Literature

In the book *Rocky Mountain Alpines* (ref. 5), Chapter 26 by J. Borland, Chapter 27 by R. D. Arpin, Chapter 28 by J. Cobb-Colley and B. Mineo, and Chapter 30 by Margery Edgren give useful information on germinating seeds. Chapter 26 gives specific information on four hundred species and Chapter 27 gives specific information on forty-three species. The information largely deals with whether or not chilling (stratification) or scarification is needed or beneficial. The problem of seeds that germinate in the cold, double dormancies, recalcitrant seeds, and other complex cycles were not considered.

References

1. Deno, N. Surface Sterilization Method. *The Bulletin of the American Rock Garden Society.* Spring 1986.
2. Bewley, J. D.; Black, M. *Seeds.* New York: Plenum Press; 1985.
3. Mayer, A. M.; Poljakoff-Mayber, A. *The Germination of Seeds.* 3rd ed. New York: Pergamon Press; 1982.
4. Kahn, A. A., editor. *Physiology and Biochemistry of Seed Dormancy and Germination.* New York: Elsevier Publishing Company; 1977.
5. Williams, Jean, editor. *Rocky Mountain Alpines.* Portland, Oregon: Timber Press; 1986.

Alpines '86 Review — 2

Colorado '86

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This personal impression of the Second Interim International Rock Garden Plant Conference really begins with Alpines '81. For me a first plant conference, a first international get-together that gave very little indication how addicting the process would become.

The first trickle of American visitors to Cumbria initiated the next phase. An outdated passport was reprocessed and visaed and a first trip to Colorado via Washington State was under way.

Prior to visiting the United States in 1982, pragmatism had been the name of the game. If plants flourished in Cumbria, who cared where they came from; I didn't. A few days in North America cured that: the Cascades, Wenatchees, Olympics, and the Colorado Rockies were overwhelming. By this short time suitably brainwashed, the resolution at the annual meeting of the ARGS in Boulder in 1982 to hold the Interim Conference there in 1986 was echoed by a personal determination to return. Only a cataclysmic decline in pound and dollar ratio could alter that.

And so in 1986, Stapleton airport looked welcoming and familiar. The University buildings in Boulder likewise, and the faces — here were the same plant fanatics that appeared in Nottingham, in Colorado in 1982 and now in 1986. The chatter of reaquaintance was deafening. The superlative book prepared for the Conference was stunning. The multi-authors were later staked out under the trees beside the campus lake to sign, sign, and sign their works for the queue winding round the tables with the patience a British queue normally shows!

The silvers and desert plants, meticulously labelled in the demonstration show troughs kept their cool, while Boulder shimmered in the heat. The plant sales were a temptation for the British contingent, despite phytosanitary certificates, but the real lures were the field trips.

Five hundred people can be a blot on the landscape. Divided horticulturally into aquilegia, dodecatheon, erythronium et al. and labelled efficiently, conferees hopped in and out of floral buses and were whisked quite unobtrusively to assorted destinations.

Too readily one forgets that Denver is the Mile High City and the urge

to explore the high peaks needs caution. The first days of the Conference led gradually into the mountain ranges. Roxborough State Park formed a transition zone where the plains met the mountains. First impressions were overwhelmingly of the stupendous red sandstone formations which had formed a hospitable area for settlers from 5000 B.C. onwards. Elevations between 5800 and 7200 feet provided plant life ranging from yucca to aspen, wet meadows and dry grassland. *Monarda fistulosa, Calochortus gunnisonii,* argemone, and *Physalis heterophylla* were in flower. Routes through the park were graded for the energy of the visitors. Finding a willing Ranger to accompany me on a personal safari, we were brought to a halt by another ARGS member, knee deep in grass, gazing with interest into the scrub and murmuring, "I wonder what that snake was." Memories are made of this!

Golden Gate Canyon State Park, 8000 to 10,000 feet, took us a little higher. Buses vanished into the park through different gates, ours to the Old Barn area. *Frasera speciosa,* a brilliant orange *Erysimum asperum, Oxytropis lambertii,* and *Scutellaria brittonii* brightened the drier slopes. The wet valley bottom had a superb island clump of *Dodecatheon pulchellum* enjoying its clump of earnest photographers oblivious of wet feet, vibrating mosquitoes, or the black thunderclouds piling up above. The rains came down with vehemence, the roll call of wet ARGS members in the waiting bus showed one missing, just like the nursery rhyme. Rangers scattered in all directions, but again all turned out well. Here too for some of us was our first sighting of *Aquilegia caerulea,* Colorado's state flower. Little Valley Nursery showed plants in captivity, almost an anomaly in a state so rich in endemics.

This Interim Conference concentrated on field trips, so all the slide shows were held in the far–from–cool of the evening. From the low temperatures and the high rainfall of Northwest England, summer evenings in Boulder require acclimitization and also air conditioning! "The Rockies — Backbone of a Continent" being the Conference theme, Jack Elliott reported on growing American plants in England, Geoffrey Charlesworth on Western plants in the East, Norman Deno on cultivation in sand, Olafur Gudmundsson on Rocky Mountain plants in Iceland. The theme continued over the days with American plants in Japan by Atsushi Kuyama and Otakar Vydra with cultivation in Czechoslovakia where rocks were transported over snow by skiing friends, neatly blackmailed into landscaping, producing an ABC of every high alpine that has caused heartburning to any cultivator.

By this stage enthusiasm for the higher elevations was reaching literally fever temperatures. Oh, for the sight of snow! Boulder boiled, the ducks on the campus pond were too hot even to relish the taco crisps and brownie crumbs. Only the magpies greeted the warmish dawn with enthusiasm and shrill cries as ARGS members fell into showers and the excellent breakfast provided by the University canteen for their short time guests burdened as

they were with packs and cameras and floras. Buses stretched over the campus as far as eyes could see and then round the corner. Afterwards all magically vanished into the mountains, giving no hint of the five hundred ARGS members, a mini-miracle of organization.

Mount Evans. How can one ever put on paper the fantastic day on the tundra around Summit Lake? In 1982 it had been good, but this visit was superlative. The sun shone; the ice on the lake, melting a little on the fringes, sparkled in the sun. *Eritrichium aretioides* in both blue and white was everywhere; *Ranunculus adoneus* glittered as bravely as any common buttercup; great clumps of *Claytonia megarhiza;* silky spikey *Phacelia sericea;* blue *Mertensia viridis* and polemoniums, the list went on and on. Film cartidges flicked in and out of cameras, then the creamy-white goats appeared, five of them and a baby. "M" on hands and hunkers, intent on eritrichium, didn't see them come. Father goat eyed the tempting target, head on side. Forgetting this could be a photographic scoop, all in earshot called a warning and we never will have that action shot for a cover of the Bulletin! Those goats were *never* wild. They posed in ones and twos against the rocks, against the horizon, nibbling eritrichium, and while the shutters clicked Mother took no notice of the small kid bleating pathetically on a ledge. The sun shone on and on; the rocks warmed for dawdling. How difficult to imagine night as cold as the ice on the lake with the bleached and ancient bristlecone pines passing the centuries under a bitter moon. This was a magic day in a magic place with prosaic evidence from Kodak to prove that these moments were not just mirages from the mind's eye.

Back in the warm Boulder evenings the home team came in to bat. Erwin Evert previewed the Post Conference Tour with "Unusual Plants of the Yellowstone Area," Elizabeth Neese showed lovely slides of the Great Basin and western slopes, Robert Heapes followed the plant hunters who opened up the Colorado Rockies, while Fred and Roberta Case presented "The Plants of the Beartooth Plateau."

Trail Ridge in Rocky Mountain National Park was the easy winter route for the squaws and children of the Ute nation, the braves taking a more macho route. The 20th century followers in the ubiquitous bus found a macadam track with "Do Not Leave the Path" notices, but over the hill were ptarmigan in halfway plumage, partly mottled with white; eritrichium with 1-inch stalks; fabulous lichens, and an eagle eye's panorama. Down the trail were mule deer, marmots, and lodge roofs weighted down with rocks against winter winds. At Poudre Lake the snow melt soaked feet, *Caltha leptosepala,* and *Trollius laxus.* The plants loved it, the feet didn't, but what are wet feet when round the next conifer are stands of *Erythronium grandiflorum!*

Bear Lake Trail revealed *Cypripedium fasciculatum, Listera cordata, Calypso bulbosa* and *Goodyera oblongifolia,* a peanut-stealing jay and

glittering water, all by a paved way and neat parking.

Rocky Mountain National Park and further surprises, man made: western music and a dude ranch supper. Rank on rank of buses with a concentration of five hundred ARGS stalwarts gathered under a Colorado sky at dusk while Longs Peak darkened against a gray–blue back cloth.

Don't think I have forgotten Denver Botanic Gardens, I haven't. I first saw them in 1982 with Panayoti Kelaidis. The sun was burning then and the gardens still shimmered with heat on the return visit. The massive rocks were interspersed with a representative collection of Rocky Mountain flowers. *Phlox mesoleuca* and *P.* 'Mary Maslin' were flowering, a remembrance of the late Professor Paul Maslin, a friend from Alpines '81 who was sadly missed. His garden, cared for by his wife Mary, was one of several visited during the Conference.

Merle M. Moore, Executive Director of Denver Botanic Gardens, opened the Conference which was chaired by Andrew Pierce, Assistant Director. Panayoti and others from the staff, together with the members of the Rocky Mountain Chapter under their chairman Stan Metsker, put together a magnificent presentation of the plants of the Rockies. This was a great conference. Evenings saw many friendships made or renewed. The paved garden of the University residence halls served for evening ad hoc slide shows, for the barbecue, and for welcome hospitality with baths of ice cooling the refreshments so appreciated after days in the sun.

If the finale was the Dinner and Awards presentation when Kenneth Love handed on the chairmanship of the ARGS to Lee Raden, then this individual appraisal of the meeting was epitomised by the stunning visual presentation by Loraine Yeatts. Caltha, kalmia, calypso, claytonia, pinus, waterfall, ptarmigan, marmot, fellfield, tundra . . . THE ROCKIES!

Innocence Abroad:

Lessons Learned in Buying Mail-order Alpine Plants from England

Jack Ferreri
Verona, Wisconsin

I suppose I'm not the only member of the American Rock Garden Society who's wanted to order plants from England. The catalogues were tempting, their reputation was legendary, and the prices (once the pound–to–dollar computations were puzzled out) seemed good. So on July 10, 1986, I ordered eighty different alpine plants, with twenty–five substitutes, from an English nursery advertising in the *Bulletin*. No, I'm *not* in the commercial side of the business. Yes, I *know* eighty different plants is shamefully excessive. But there was a minimum order amount of £80. And raising things from seed is, after all, a slow process. And they had lots of neat things. You understand. I went into this exceedingly ignorant of what was involved, and a subsequent look through back issues of the *Bulletin* shows little to be found there on this matter. I thought readers might find my experience useful.

To send the money overseas, I went to a local bank. After a bit of uncertainty and some shuffling through pages of "Procedures," they figured out what I needed. I gave them cash and received an International Bankers Draft drawn on Barclay's Bank in London. The plants and shipping cost $145.50. The check cost $12.00, for a total of $157.50—I mean £93.88. When the clerk asked me what I was ordering from England, I answered with a mix of embarrassment and pride, "Special plants."

The order was, of course, for fall delivery. The nursery's catalogue mentioned that fall delivery meant October. Here in southern Wisconsin (which is much colder than far northern just about everywhere else), waiting until October to put plants in the ground to winter over is a bit risky, but since I had grand plans to build a serious cold frame—not to be confused with the cold frame I built last year—I judged it worth the gamble. I placed the order, anxiously explained the bitter cold of Wisconsin winters (–25°F not uncommon), and begged them to send my order as quickly as possible so the plants could settle in before deep frost. I awaited the fall with green dreams.

July and August passed, and I was busy enough not to spend a lot of time thinking about my overseas order. I have some natural limestone outcroppings on my 2–acre country lot, and I spent a good part of the summer excavating them for planting in the spring. If those plants came a little early—

say in mid-September—I might even get some of them into permanent positions before winter set in. In September, I started inquiring about packages when I called my wife from the office. I asked weekly at the start of September; by month's end, it had become a daily ritual. They *must* have seen my plea for an early shipment—*surely* the shipment must be coming any day now. Like most gardeners, I'm not short on patience. But I sure did want to see a box on my front steps.

October arrived. Temperatures were fairly mild; nighttime lows stayed up in the forties. I started thinking of the previous winter in this part of the country, when snow fell in the second week of November and stayed until April. Every cheap garden hose and two-buck trowel for hundreds of miles spent the winter entombed, to be found ruined in spring. What if my plants were lost or seriously delayed? What would I do? Winter them over in my basement? Put them in my root cellar? Use them in a salad? Should I change my order to a spring shipment?

My concern for late delivery was fueled by my knowledge that I'd ordered a few plants that no Wisconsinite in his right mind would order: *Helichrysum bellidioides, Lithodora diffusa* 'Heavenly Blue,' *Pratia pedunculata, Helianthemum appeninum,* and a few others. Long shots at best in this part of the country. But I'd figured they'd be established in my cold frame for a protected winter, and then I'd do some division next summer as insurance if I lost them out in the garden the following winter. But if they were very late in arriving, well, they were going to be nothing but cannon fodder for Old Man Winter.

By mid-October, I started envisioning my plants slowly freezing solid on a loading dock in Chicago. I decided to call England—one of my first trans-Atlantic calls. After a few minutes revealing my ignorance of British geography to the overseas operator, the line clicked. In the excitement of the moment, I didn't catch the woman's pronunciation of the name of the nursery (of which I hadn't and still don't have the slightest idea), so I stammered, "Is this the nursery?" "Yes," she said patiently. I asked about my order, and she said the overseas orders were to be going out the next week. I had wanted to ask how long the shipping would take, where I would pick it up, a thousand other questions. But I settled for knowing the plants would be on the way to me next week. My wife noticed I began to take a more-than-usual interest in the local weather lady on the evening news. I dreamed that, upon arrival in frigid weather, the plants would stalwartly refuse to come out of the box, "There's no way me and my chums are going outside in *that*."

At the close of the following week, there appeared in my mailbox—a postcard:

> Dear Mr. Ferreri, Thank you for your order for plants which we are at present preparing for dispatch. We require your import

permit with number from the USDA in order to show to our plant inspector and also to facilitate entry in your country (yellow and green label). We will send by Air Mail Parcel as the order is not large enough to warrant expense on air freight, where the minimum charge is about 60 pounds. We will send you an invoice after dispatch for packing and export charges plus postage less an allowance for the UK V.A.T. and your prepayment on account. If you can let us have this document by return post I would be grateful as your plants are being inspected this coming Thursday. Yours sincerely.

Import permit? USDA? Yellow and green label?

I live outside Madison, the capital of Wisconsin, so in flushed panic, I called the local office of the United States Department of Agriculture. They were helpful, but explained they were familiar with only cash crops, I'd have to talk to their main office in the Federal Building, Hyattsville, Maryland. I finally spoke with a gentleman in Maryland named Bill Forster whose title is—are you ready?

Head Permit Unit
Regulatory Services Staff
National Program Planning Staff
Plant Protection and Quarantine (PPQ)
Animal and Plant Health Inspection Service (APHIS) !
United States Department of Agriculture (USDA)

Despite all this, he was eager to assist me. I'd need a PPQ 587 (Application for Permit to Import Plants or Plant Products). Once I filled it out and returned it to his office, he'd send the required permit and number, along with, yes, the special yellow and green labels that tell the Customs officials on the coasts exactly where to send the packages for the required USDA inspection. Simple, right? Nothing to this plant import business.

Armed with this information, I managed to locate a PPQ 587 at another USDA office in Madison. It was easy. I filled in who I was, what country the plants were coming from, and attached a copy of my original ordering letter listing the plants. I then dispatched this (on October 27) to Mr. Forster at the USDA Maryland office. To save time, I enclosed a few dollars in cash and implored him to forward the labels and permits directly to the nursery in England.

Well, that's taken care of, I thought. Mr. Forster called me a few days later. "It's not that simple," he said. "You have to look at these materials and make a few decisions."

"What materials? What decisions?" I asked.

"Like which plants are prohibited from entry . . . and whether you want Federal inspectors to come and visit your garden."

I sighed and said, "Send me the materials."

Winter drew closer. Were those snow clouds on the horizon? A few days later, I tore open a large manila USDA envelope, and my desk was buried in a flurry of forms and pamphlets.

The first thing I noticed was a carefully typed PPQ 597 (Import Permit for Plants and Plant Products), along with several of the by-now priceless green and yellow labels. The forms included my Permit Number and a few paragraphs of instruction that, in essence, told me to take a careful look through all the other things sent along in the USDA envelope. At least the permit was taken care of. In addition, Mr. Forster had typed on the form the following caution:

> *Chrysanthemum* spp. and *Dianthus* spp. plants are subject to post-entry quarantine restrictions. Briefly, this means that such materials must be grown in detention on land owned or controlled by the importer for a minimum of two years to provide for the necessary field inspections to ascertain freedom from disease. If you wish to import plants under these conditions, please complete the enclosed PPQ Form 546 and forward copies following instructions on the form.

I had ordered *Chrysanthemum weyrichii* as well as *Dianthus carthusianorum* 'Atrorubens' and *D.* 'Nyewood's Creme.' I wasn't about to pursue the question of whether a hybrid was to be treated any differently than a species. I decided to change my order to include less controversial plants.

The packet of materials contained much else. I was delighted to see that none of it meant any further bad news for my order. There was a long list of "Common Plant Genera Not Prohibited or Subject to Postentry Quarantine Under Quarantine 37." This list of about five hundred genera included the vast majority of alpine plants—*Gentiana, Campanula, Primula, Saxifraga, Androsace*, etc. One could spend a lifetime rich in rock gardening without wandering from this list.

The USDA packet included lots of other interesting things:

• A list of Endangered or Threatened Plants (all but one an American native) along with some arcane language that suggested these plants were not to be imported by anyone without a lawyer in the immediate family.

• Another list included plants subject to CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) regulations. This went on for pages and included a large number of American cactus species, as well as a few species familiar to at least this rock gardener: *Saussurea lappa, Shortia galacifolia, Euphorbia* (non-succulent spp.), *Meconopsis regia, Lewisia cotyledon, L. maguirei, L. serrata, L. tweedyi, Cyclamen* spp. These plants are to be treated differently from regularly

imported plants and need an additional permit from the Acting Chief, Wildlife Permit Office, US Fish and Wildlife Services, US Department of the Interior, 100 N. Glebe Road, Arlington, VA 22203. Again, much legal talk. I suspect if you want to import these plants, you'd better have a United States Senator or Cabinet member in your family or go have a chat with a knowledgeable nurseryman about the approval process.

• A list of plants prohibited entry into the United States under the Federal Noxious Weed Act. About a hundred species, none of them listed in Ingwersen's *Manual of Alpine Plants.* These appear to be plants that, indeed, no one can love, not even alpine enthusiasts.

• Another list of plants, mostly food or exotic types, with reason for their not being allowed in the country. The list of pests and diseases some of these plants harbor makes them prime candidates for a made-for-TV movie: Cadang-cadang disease, Datura distortion or enation mosaic virus, Lethal yellowing disease, etc.

• Agreement for Postentry Quarantine—State Screening Notice (PPQ 546). Had I wanted to go ahead and order the chrysanthemum and dianthus, I'd have filled this out. I would be agreeing to a whole range of conditions: Federal or State officials would be given access to my garden during business hours, plants separated from others of the same genus by 3 meters, no cuttings given out until quarantine is over, etc. The chrysanthemum quarantine lasts 6 months after importation, the dianthus for 12 months.

After sorting through all this material, it was time to act. On November 2, I sent off the Import Permit (PPQ 597), a few labels, and a note to replace the dianthus and chrysanthemum with some of my substitutions. Of course, I put in another urgent request for speed.

Within a week, I received a call at the office from the nursery. Did I want them to ship Air Mail Parcel or Air Freight? The difference was simple: Air Mail Parcel meant $45 and perhaps 2 weeks or so, Air Freight means $120 and perhaps a week to a week and a half. Things were starting to get a bit costly. Since the time difference between the two options was not great (and the dollars were), and since temperatures were still relatively mild, I took the Air Mail Parcel route.

On November 25, I found a notice from the Post Office in my mailbox telling me that a package of "bulbs" had arrived from England. Within 24 hours, the plants were retrieved and potted up in 4-inch pots. They were in good condition. Of the eighty different plants I received, seventy-nine looked none the worse for their travels. We'll see how that eightieth one does after the winter. Within a week, I finished the cold frame and plunged the pots up to the neck in sand. I backed the cold frame up against one of my cellar windows so that heat leakage through the window would, maybe, cut the severity of the cold. The adventure was over.

One irony of this entire saga is weather. Here in Wisconsin, we had the warmest early winter in many years. As a matter of fact, I had to give the pots some water between Christmas and New Year's Day. Temperatures didn't really get cold until the middle of January, when it started to dip down to −10°F at night. This winter in England and throughout the rest of Europe was a terror. I had been lucky. And so had the plants. Our New World weather proved more accommodating. I'm looking forward to a floriferous spring.

Some general recommendations based on my experience: 1) Depending on your location in the U.S., be wary about English standards of hardiness. I know this is old news, but it's easy to get caught up in catalogue copy even when you know better. 2) Don't order for fall delivery unless you live in a warmer part of the country. 3) When you order your plants, contact the USDA and get started on the paperwork for your import permit. If you can get a PPQ 587 from a USDA office in your area, you'll save yourself some time. Just fill it in and send it out. If you can't lay your hands on one locally, you'll have to get one from the folks below.

The address for permits and mailing labels is

Permit Unit
USDA, APHIS, PPQ
Room 638, Federal Building
6505 Belcrest Road
Hyattsville, Maryland 20782

Omphalodes — This seems to be one genus of the family that has only refined members, with the usual elegant flowers so utterly simple while minus the zillions of invisible little needles that make so many borages such unexciting garden plants. In England last summer we were introduced to an annual species new to most of us; *Omphalodes linifolia 'Alba'* is rather a gray-leaved foot-high plant for lightly shaded or cooler sunny spots, for example, where bulbs have gone to rest. There is a normal blue form too with pleasantly pale or watery blue flowers, every bit as pretty as blue-eyed Mary (*O. verna*) but without the rich green leafage. Farrer carried on about this having been Marie Antoinette's favorite flower.

B.L.D.

About Winter Aconites and Things

Dear Mr. Bixley:

We can read a lot of varied opinions on such matters as were brought up in the discussion of a search for truth in the literature of the winter aconites, although a thorough understanding of it all would require the impossible—not only words but also living material as it was being discussed. We have here a wide-ranging population found and brought back from different places and in the manner of wild flowers, varying within these several collections. At the time of their horticultural acquisitions they were accorded more than a single name. We now have the situation as discussed, with the many options as quoted. Because the name *Eranthis hyemalis* was the earliest one (and if we are to concede that several other described populations are to be considered as minor variations of the same species) then we take that name to be the correct one, by the botanist's rule of priority.

We are here dealing with plants in cultivation. Populations in the wild may display a deal of variability within geographically narrow regions or between widely separated colonies. We might gather early and late, large and small, brightest and palest, the most or least feathery ones. Over the years of cultivation each selection can be increased to great numbers and dispersed to gardens over the globe by whatever name. But looking at what we have in cultivation does not tell us the true story of their origins. Therefore, should we seek the answers to such questions as discussed we need consider such ramifications as definitions of terms. For example, the horticultural approach is inclined to take the splitter's view of such problems, merely in that we value in cultivation the small differences (distinctions) whereas to the botanist who deals in populations rather than fractions thereof, the opinion might better approach that of the lumper, or at least so if the approach taken is in the vein of systematics. In recent years the systematists seem to be winning in popularity over the antagonists, their splitter brethren.

For one thing, in comparing these writers' opinions we should feel assured that each was in possession of correctly identified material, not an easy matter.

For another thing, we need to understand that *synonymous* as here used is not to be equated with *identical.* In horticulture we are accustomed to expect all the plants under one label to be exactly alike, but this is just not the way it is in nature's wildflower populations.

As to weighing the opinion of one authority against that of contemporaries, Mr. Ingwersen is self-acknowledged as a mere "dedicated plantsman" although as we all know, he is at the same time a professional nurseryman.

Mr. Mathew in addition to having trained under Mr. Ingwersen in that field (and just as dedicatedly) is acknowledged as a taxonomic botanist with one of the finest institutions of its sort anywhere. They just *might* be expressing comparable opinions but in quite different terminology. We could, I am sure, expect that Mr. Mathew has had a broader exposure to developing a base on which to stake an opinion.

As for myself (neither a taxonomist nor specialist in winter aconites) were I pressed to selecting a BEST (and I rather suspect that is what we all hope to learn from these discussions) it would be 'Guinea Gold' and I quote yet another experience, that of Paul Christian, a specialist grower in Wales who says of it, "the finest, with large bright golden flowers on long stems very early in the year." I also reason that were it not superior it would not be laboriously grown by division, as it is if you want the TRUE stock.

In summation may I suggest that the run-down on Eranthis might go something like this:

E. cilicica . . . . . Botanically a form of *E. hyemalis* from Turkey, best called *E. hyemalis* var. *cilicica.* Leaf segments narrower; flower a bit larger, buttery yellow.

E. hyemalis . . . . . Western Europe. Earlier form with slightly smaller lemon flower, the plant with no tinge of bronze.

E. sibirica . . . . . Probably not in cultivation; a published name however for a smaller Siberian form, *E. hyemalis* var. *sibirica.*

E. x *tubergenii* 'Guinea Gold' . . . . . The cross of *E. cilica* with *E. hyemalis* made in Holland in 1923 and from which the clone 'Guinea Gold' was selected as superior to all others. In spite of words written to the contrary, this is fully fertile and seedlings are sometimes sold by the name, perfectly acceptable if it is seedlings you want.

In addition there is the Japanese species *E. pinnatifida,* also sometimes called *E. keiskii;* a separate genus *Shibateranthis* has also been proposed for this small whitish relative of the yellow winter aconite. Setsubun-so in the Japanese language.

B.L.D.

The Hypothetical Convention of Southeast Arizona

Sally Walker
Portal, Arizona

Introduction

The book *Rocky Mountain Alpines* includes a chapter on the White Mountains of Arizona as a southern limit of the range. I believe the reader is left to assume that the end of the Rockies is the end of the mountains in Arizona, and there is nothing but desert to the Mexican border. But in southeast Arizona there are a number of mountain ranges separated from one another by wide, flat desert valleys, 2000 to 4000 feet high, ranging from desert vegetation to prairie.

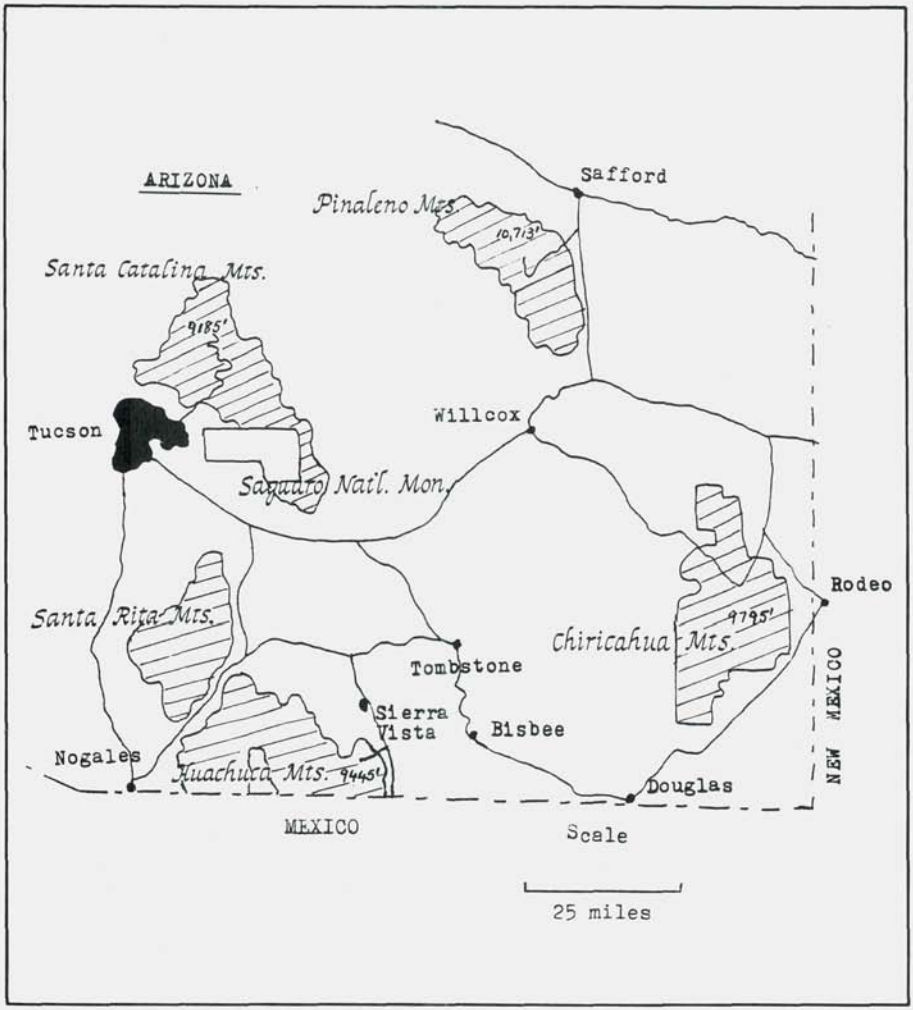
We could start the annual flower season in Arizona in November. That is usually when the winter storms begin, and they are necessary for a good spring wildflower display. The ajo lily, *Hesperocallis undulata,* usually flowers in early March, but the main flowering season is about 2 weeks later. Some of the showiest flowers are *Anemone tuberosa, Baileya multiradiata, Calochortus kennedyi, Delphinium scaposum, Dichelostemma pulchellum, Eschscholtzia mexicana, Lupinus sparsiflorus, Orthocarpus purpureus, Penstemon parryi, Platystemon californicum, Rafinesquia neomexicana,* and *Salvia columbariae.* Most of the desert wildflower season is over by the first of May.

But it is the mountain flowers in which we are interested, and so it has been decided to hold a fictitious conference to show these flowers to the conferees.

Day 1

It is now June 25, 1987 and the Committee welcomes you to 'Alpines '87.' Our headquarters is in Tucson. Today we head toward Sierra Vista which is about a 2-hour drive southeast. (One of the problems the Committee had to overcome was transportation. None of the mountain ranges can be negotiated by large buses, so we had to arrange for the large buses to take us to the base of the mountains, and then for a series of shuttle buses to take us to the end of the road.) The Committee apologizes for the dried up appearance of the countryside, but that is to be expected as it hasn't rained for over 2 months. Unfortunately, the two plants we are going to see today bloom at the hottest and driest time of the year.

From Sierra Vista we head south on Route 92 on the east side of the


ARIZONA
Safford
Pinaleno Mts.
10,713'
Santa Catalina Mts.
9185'
Tucson
Willcox
Saguaro Natl. Mon.
Santa Rita Mts.
Rodeo
9795'
Chiricahua Mts.
Tombstone
Sierra Vista
Bisbee
Nogales
Huachuca Mts. 9445'
Douglas
NEW MEXICO
MEXICO
Scale
25 miles

Huachuca Mountains until we see the sign for Ramsey Canyon. We take the dirt road here to the Nature Conservancy Preserve. Along this road at about 5500 feet we will see a flash of brilliant vermilion. These are the flowers of the coral bean *Erythrina flabelliformis.* These spiny, leafless bushes are about 3 feet high with the flowers at the ends. The aspen–like leaves will appear after the rains start next month and turn yellow before being shed in October. In autumn erythrina also produces pods opening and displaying orange–red beans separated by a white stopper. For the rest of the year it is just a bunch of dried sticks.

At the end of the road we hike. The Committee apologizes for the gnats. It is really just a short time of the year that they are with us, and the 95 to 100°F. temperatures, but at least you are unlikely to see any rattlesnakes as they don't like this weather either. At 6500 feet right in the creek bed we will find the whole purpose of this trip, *Lilium parryi.* There isn't much of it, so it is fortunate that it is a protected plant in Arizona. It grows in sheltered areas near the creek under the shade of conifers, but there are other seemingly suitable places devoid of the lilies. They are about 3 feet tall. The lowermost leaves are in whorls up to 6 inches long. Higher up the stem, the leaves are scattered and become reduced in size. The six pale yellow perianth segments are reflexed and have a few dark brown spots. The anthers are orange–brown and the flower is scented.

After our first day's field trip, the Committee came up with a serious problem: what to do with 600 people until the rainy season is underway and we can show them some more plants. We decided to send everyone home and continue the conference in a month.

Day 2

It is now July 25, 1987 and the Committee welcomes you to the second day of the pseudo–conference. The rains have been coming steadily in the form of afternoon thunder showers for 2 weeks now. We have to drive to the east end of Tucson and then we need no longer apologize for the scenery. It is amazing how everything has greened up since we were last here. We see the sign to Mt. Lemmon which is in the Santa Catalina Mountains. The road is paved to the summit, but it is not suitable for large vehicles. We are still in the desert with the saguaro cactus *Carnegia gigantea* and may see some attractive flowers such as the yellow–flowered shrub *Tecoma stans,* the lavender *Ipomoea laptotoma* and the yellow mallow *Hibiscus biseptus.*

We proceed to the evergreen oak zone at about 5000 feet. There may still be some white flowers on the Arizona rosewood, *Vauquelinia californica,* a small evergreen tree in the rose family which isn't even listed in Munz *A California Flora.* For understory, two members of Onagraceae are prominent:

the well-known *Oenothera caespitosa* and the August-flowering orange-red *Zauschneria latifolia.* Two labiates, the purple and white *Trichostema arizonicum* and the red *Stachys coccinea;* the taller mallow, *Sphaeralcea fendleri venusta;* and *Penstemon pseudospectabilis* should be flowering at this time. We may find the capsules of *Zephyranthes longifolia* opening to expose their flat black seeds.

Stopping at 7000 feet we may see the sub-shrub *Bouvardia glaberrima* with its bright orange-red flowers. The orange-red color is seen frequently in this area, often denoting hummingbird-pollinated flowers. *Heuchera sanguinea* and *Tagetes lemmoni* may also be found at this elevation as well as the endemic *Penstemon discolor.* It is a sub-shrub with pale pink flowers.

At 8500 feet we find another endemic, a subspecies of the well-known *Gilia aggregata, G. aggregata* var. *macrosiphon.* It has a longer tube than the red form, but it is pink with purple spots. In the more shaded areas we find *Disporum trachycarpum, Smilacina racemosa,* and *S. stellata* and in more exposed areas *Penstemon barbatus.* At the end of the road we find too much civilization, with radio towers, a ski lift, and a restaurant. This 9000 foot level also includes the rather uncommon shrub *Sorbus dumosa* and the yellow *Aquilegia chrysantha,* the latter also found at lower elevations.

We return to Tucson for the night.

Day 3

July 26, the third day of our trip, we head east on Interstate 10 to just past Willcox where we follow Route 666 to Safford, but before arriving at this town we take Route 366 up into the high country of the Pinalenos, which is also known as Mt. Graham. The desert country at the base of the mountain is Chihuahuan and lacks the saguaro cactus. Since we have already been on the road for 2 hours, we will head straight up to Ladybug Saddle which is at about 8500 feet. The road levels out here and continues north between 8500 and 9000 feet. We have a good view to the west and drier side.

There are rock outcrops here in which we see brilliant blue flowers of *Salvia arizonica* and the deep coppery-orange flowers of *Erysimum wheeleri.* On the slopes, *Gilia aggregata* grows. The main attraction of the area is *Dodecatheon ellisiae.* This white shooting star is rather shy flowering. Some of the plants are riparian and are therefore not dependent on the summer rains to start blooming and may begin flowering as early as late June. However, the same species often blooms in thick patches under the Douglas firs in August, and consequently their seeds ripen later too.

Along the creek *Mimulus cardinalis, Mertensia franciscana* and *Polemonium filicinum* are found. Continuing 5 miles from the end of the pavement we arrive at an alpine meadow where *Gentianopsis detonsa elegans* and *Dodecatheon radicatum* bloom.

After descending from the mountain, we head for Safford to spend the night in order to be ready for the next day's trip which is also in the extreme southeastern part of Arizona.

Day 4

On the fourth day, July 27, we drive back to I–10 then head east to San Simeon where we leave the interstate highway and head for Rustler Park, which is at 8400 feet in the Chiricahua Mountains. The park is an amphitheater with a meadow of *Iris missouriensis,* now past flowering, surrounded by tall pines and firs. Shorter trips can be arranged to observe many of the plants, but in order to see all the plants it is necessary to walk 18 miles round trip.

We start off through the conifers on the south side of the amphitheater to the base of an enormous north–facing cliff called Suicide Rocks where we find the red and yellow *Aquilegia triternata* and the pale yellow *Polemonium pauciflorum,* which is known only from these mountains (apart from Nuevo Leon in Mexico). We also see *Heuchera versicolor* and maybe one or two plants of *Primula rusbyi.* Away from the cliffs we find the red–purple *Salvia lemmoni.* This trail comes out on a very steep and rough stretch of road which continues to Long Park which is 2 miles from Rustler Park at 9000 feet. We pass *Thermopsis pinetorum* on this road and there is a large stand of *Delphinium andesicola* at the end. From here the trail is fairly level and we enter the wilderness area.

The first stop in about 2½ miles is Round Park where the yellow–orange *Sisyrinchium arizonicum* grows in the meadow with *Iris missouriensis.* It is 2 more miles to Junction Saddle and we take the right fork to Monte Vista Peak. It is along this part of the trail that we find a large colony of *Primula rusbyi* growing in a north–facing rock slide. *Chimaphila umbellata* and *Pyrola virens* grow in shaded areas, whereas the red–orange *Silene laciniata* chooses sunnier spots. On rocky outcrops we see flowers of the well–known *Penstemon pinifolius.* Where the trail skirts some large rhyolite cliffs, we see the green mats of the recently described *Erigeron scopulinum* in crevices. This plant flowers in early June and bears tiny white daisies on a 1–inch stem.

Returning from this long hike, it is late. We drive over the west side of the Chiricahua Mountains and after 50 miles we join Interstate 10 at Willcox and go back to Tucson where we terminate the conference.

Conclusion

Many of the plants mentioned occur in more than one mountain range. I hope you have enjoyed being introduced to some new plants as well as seeing some old favorites in the wild and can appreciate that Arizona is not just one big desert.

Thoughts and Trials of a Tenderfoot

John W. Smith
Grand Rapids, Michigan

My gardening experiences span a period of over 35 years. I have raised all the usual run of perennials, annuals, bulbs, and wildflowers, plus many unusual varieties, but my knowledge of true alpine flowers was totally lacking. Oh, I'd heard about and read reference to "alpine" wildflowers, but simply dismissed these as plants that were native to the European Alps and wouldn't be available to Americans and couldn't be grown in flat–land gardens anyway. But 3 years ago, while my wife and I were spending the winter down south, I picked up a book at the local library regarding alpine flowers which opened up to me a whole new field of flower raising. All those captivating color photos and glowing accounts of exquisite alpines fanned my desire to grow these beauties, completely oblivious to the pitfalls and heartaches that awaited me. But where could these alpines be obtained? Fortunately the address of the ARGS was given in the book I had read, so I promptly wrote to join. As a result of joining ARGS, I saw ads in the *Bulletin* giving sources for alpine plants. I couldn't wait to get home to start the adventure.

The building of a new garage on our city lot necessitated a rearrangement of our backyard flower borders. It seemed like a good time to attempt a rock garden. However, the restraints of a small backyard (65 by 132 feet) made it difficult to find room for alpines without sacrificing many of my beloved iris, hemerocallis, astilbes, liliums, and other perennials. Something had to give. My wife and I decided that a vegetable garden we had had for many years was expendable. At the same time I widened some of the existing borders. These two moves opened up room for an alpine garden, allowed me to retain my perennials, and in fact allowed me to add many new varieties.

Our rock garden might be frowned upon by those people who have unlimited space for a beautiful "natural" garden with lovely vistas, winding paths, pools, and running water. Those are luxuries not available to me, but my appetite to grow alpines is no less intense. I had to settle for a raised bed measuring 4 feet deep by 30 feet long in front of a wood fence across the back of our property, with two arms at the ends measuring 3 by 18 feet and 4 by 10 feet. The construction of the rock garden spanned 8 weeks and would have been even longer had it not been for the wonderful assistance of my wife Anita and a very good friend who in the process also caught alpine fever. I chose a basic scree mixture (three parts ½–inch crushed stone, two parts builders sand, and one part sphagnum peat) which was spread 6 to 8 inches deep over a 6–inch layer of 3–inch crushed stone which had been

applied over a 4– to 6–inch layer of broken concrete and medium–size stones. For those plants requiring peat or leaf mold in liberal quantities, the scree mixture was altered accordingly. Attractive field stones were obtained by scouring roadsides, farmers' fields and orchards (with permission), and abandoned gravel pits.

The first alpines, numbering about one hundred plants, purchased from three well–known nurseries, were planted in early September 1985, together with dwarf conifers, dwarf daffodils, species crocus and tulips, dwarf allium, *Anemone blanda,* and winter aconite. I had read in the books that one should expect to lose some plants, but I was not emotionally prepared for the losses my garden suffered over the winter of 1985–86. One third of the original alpines were dead by April 1. This was a devastating jolt to my ego because over 35 years of flower raising, my losses have been virtually nil.

I immediately placed another order for additional alpines, avoiding species I had lost over winter, to fill the void. I'm happy to report that this spring and summer many plants of easy culture such as aquilegia, arabis, campanula, dianthus, geranium, helianthemum and *Pulsatilla vulgaris* flowered. Of particular joy to me was *Adonis amurensis* 'Fukujakai' with its very early, glowing yellow blossoms. Other plants such as *Anacyclus depressus, Androsace lanuginosa, A. sarmentosa, A. sempervivoides, Draba dedeana, D. x salamonii, Erinus oliverus, Gentiana lagodechiana, Penstemon rupicola* are alive and growing, if slowly. *Antennaria dioica* 'Nyewoods,' *Callianthemum miyabeanum, Daphne cneorum* 'Ruby Glow,' *Genista pilosa* 'Procumbens,' *Talinum spinescens,* and *Tofieldia coccinea kondoi* are doing poorly. So, in spite of losses, there is some hope for optimism.

After talking to rock gardeners at the Second Interim International Rock Garden Plant Conference this past summer, it was evident that other gardeners, even the experts, suffer losses. As one experienced member of our Great Lakes Chapter remarked to me, "I have the biggest compost pile you ever saw made from plants that have died one me." While that helped to mollify my injured ego, there still remained the feeling that I had made glaring mistakes and there had to be valid reasons for those mistakes. So, back to the books, but this time books with not just pretty pictures but with real meat, books with detailed cultural requirements of alpines.

Over the past 8 months I have read every alpine flower book I could purchase locally, or borrow from our local libraries and the ARGS–Pennsylvania Horticultural Society Library Service. I have read the same books not just once, but many times, trying to find the cultural needs for alpines, sifting through the conflicting opinions from one author to another. I prefer books written by American authors who have experienced American weather. While books written by gardeners in England are very interesting, English gardeners are not aware of the wild extremes in weather we have to contend with here.

In Michigan our winters can get well below zero, and our days can reach 80° starting as early as April or May. Two books that have been very helpful to me are *Rock Gardening* by H. Lincoln Foster, and *All About Rock Gardens and Plants* by Walter Kolaga. Both are excellent. Kolaga is the only writer I have found, thus far, who is specific about the pH range of various species.

In reviewing my plant failures, it was evident that my rock garden venture had been undertaken with too little knowledge of the exact requirements of each plant. I made the fatal mistake of being impressed by pretty pictures in books and in relying on incomplete data in those books and in nursery catalogues. Some nursery catalogues give no cultural information whatsoever, some are very sketchy, a few do a much better job, but even they fail to specify whether their plants want alkaline or acid conditions, or specify the pH range.

Alpine nurseries, I feel, have an obligation to furnish full cultural requirements for the plants they sell. This isn't asking too much. After all, when I purchase a camera, I receive a brochure giving me all the features of that camera. Automobile manufacturers and dealers also fill me with facts and figures. Not so in the case of many alpine nurserymen, and perennial nurserymen as well. Too often we get, "give well-drained soil in full sun" when we need to know more detailed facts about best soil, site, exposure, pH range, hardiness, and other factors affecting a plant's success. Or we get "very floriferous" when the truth is that the plant is so invasive that it overruns everything else in the garden. Some nurseries go part way in supplying plant information, but all too often fail to give some one important requirement that means the difference between success and failure. I'm mindful of the fact that more detailed catalogues will be costlier for nurseries to prepare, but I for one would gladly pay for a good detailed cataglogue rather than have to wade through a dozen books trying to find the cultural data I need. Alpine gardeners with many years experience may not need a detailed catalogue, but those of us who are new at this game need all the help we can get.

As I write this article my desk is awash with five books plus fifteen plant and seed catalogues all of which are referred to in my quest for attractive plants and the best method of growing and propagating. There is so much information, and so many conflicting opinions on successful alpine plant culture that a beginner can't possibly store it all for future use without a photographic memory, or the aid of a computer. Since I have neither, it occurred to me that a card file for various genera and species, with a number of pre-printed cultural requirements which can simply be checked off on each card, could be invaluable in storing information for future use. Accordingly, I've had index cards printed on which I can record a wealth of information about soil requirements, pH range, exposure, and so on, plus space for listing

species which sound interesting. Thus far my card file consists of over 165 genera of alpines, plants only, no bulbs or conifers included, and with species listings of many times that number. This card system may not be original with me, but it is something other ARGS members might want to try if they have the time, patience, and persistence to delve through stacks of books and catalogues. Long–time alpine growers have learned through experience. But I'd like to speed up that learning process, if possible, for us beginners. Perhaps this card system can offer some help.

I realize that after all the reading, and all the gathering of data, there still is no assurance of success. Alpines are, by nature, temperamental prima donnas who may, or may not, condescend to share some of their beauty with us and favor us with some slight reward for our amorous attentions.

In spite of failures in the past, and undoubtedly more to come, I intend to forge ahead, eternally optimistic that some day I too will have a beautiful alpine garden. In the back of my mind are plans for tearing out some more lawn to make room for another rock garden. It's an insane game—but fun!

Book Review

A Guide to Hardy Ferns by Richard Rush, Special Publication No. 1, The British Pteridological Society, *c/o* The British Natural History Museum, Cromwell Road, London SW7 5BD, England.

It is a very rare gardener who's devotion to plants is not almost equalled by a passion for reference books. The sources of information range from annual catalogues with their enticing descriptions to expensive coffee table pictorials, all adding enrichment and knowledge to the basic source of pleasure—one's favorite plants. Thus it is always a delight to find a work that in response to a need expands on currently available information, is interesting, accurate, and comprehensive, or, most exciting of all, exceeds expectations for all of the above. For the fern enthusiast, such a publication is Richard Rush's *A Guide to Hardy Ferns.* Whether you grow one or two token background greens or every available species as the focal point of the garden, here is an affordable book steeped in solid horticultural information on the ornamental value and potential hardiness of the world's selection of ferns.

With the exception of Reginald Kaye's excellent book, *Hardy Ferns,* most

contemporary fern literature is devoted to a defined geographical area. Chris Page's *The Ferns of Great Britain and Ireland* and John Mickel's *How to Know the Ferns and Fern Allies* (North America) are outstanding examples of such complete and valuable references.

Rush's book is different. As the author notes in his introduction, "...too few species have as yet been certainly tried as hardy. If this might account for the limited coverage in cultivation books, this relative neglect has, in its turn, done little to encourage gardeners to try further species. It therefore seemed to me that what was required was a guide which, as well as listing species already tried, suggested species which might be worth trying ...." So, the book has no keys nor illustrations, but rather is an international directory listing with descriptive notes some 581 hardy and potentially hardy species, depending on your clime or deliberately composed eco-niche. In addition he notes the most significant of the cultivars. The book is also extremely well cross-referenced, an important contribution considering the tendency for fern names to change seemingly annually.

The information presented has been gathered from some fifty-nine references including growers from assorted climates in Europe, the United States, and Japan as well as from research in his very extensive fern library. The commentary is tempered by the author's observations on the health and ornamental performance of most of the species in his own garden in Essex, England.

For the most significant genera, Rush gives an introduction. For the individual species he details the specifics of countries of origin, soil preferences, height, evergreen/deciduous characteristics, ornamental appeal, and quirks. Furthermore, the guide offers a healthy dose of encouragement to augment a fern collection with adventure and an unfamiliar specimen. He is completely honest and the information is as useful to the layman as it is to the professional. His research also reflects a sincere effort to clarify material that has been confused in literature and consequently (and regrettably) in the trade. The strength of the book, however, is in the extent of his international coverage and his efforts to select the hardy fern from the thousands of tender ones.

Rush is fully aware that it is one thing for a plant to survive and quite another for it to look attractive in the landscape. He is also sensitive to the distinction between the collector (who dreams of having both) and the non-specialist who is basically interested in consistent quality. Consequently he gives performance analyses of such diverse species as the difficult *Grammitis billardieri,* the rare and tempting *Dryopteris lepidopoda* as well as the species common and frequent in cultivation, *Dryopteris erythrosora* et al. His comments, recommendations, and precautions would be unavailable without an extensive library; however, for further research all the references are listed.

Whether reading a catalogue, a spore list, or flushing out the botanical information from a key, I find that I habitually reach for certain references and Rush's book has quickly become one of my top choices. From there I am able to expand my research as necessary. Rush has produced a volume that is universally useful and I recommend it without reservation. As the author is also an artist, I hope too that the British Pteridological Society will someday commission him to illustrate a second edition of his fine guide.

— Sue Olsen
Bellevue, Washington

Omnium-Gatherum

Corrections — Two major errors got past a sleeping and now remorseful editor in the Winter issue. Cries of distress rightly came from Vaughn Aiello for a manglement of feet and inches in his article "The Fires of Winter." Page 34, second paragraph: *The 6-inch one* should have been *the 6-foot one,* then four lines later there is a 12–inch instead of a 12–foot Stewartia! Nicholas Klise suffered the indignity of having two of his three pictures (pp. 26 and 27) and their proper captions parted in some way as yet unknown.

Seed Germination — Norman Deno's suggestion, "A worthy project would be for ARGS members to choose species which abundantly seed for them and to study storage and germination behavior of such seed in detail" has much merit. The next step is to share that information; the pages of the *Bulletin* are offered for that purpose until a better vehicle is suggested or until the *Bulletin* is overwhelmed.

References — An interest in sources of material for further research has been expressed. If there are books you have found particularly helpful or inspiring, will you share them with other readers? A short note giving the bibliographic particulars and a word or two about the book to pique readers' interest is all that is really necessary. Short reference lists may be included with articles and will be used when appropriate space is available.

Shortcut for Beginners — Does one exist? I doubt it. Nothing worthwhile ever seems to be easy. Nursery owners, experienced gardeners, other beginners, you are invited to respond to Jack Smith's frustrations shared by many, maybe most, beginners. Where do you think the responsibility lies? If Mr. Smith is reaching for the unreachable, where and why? What can we reasonably do to help? What helped you?

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