

BULLETIN

of the

AMERICAN

ROCK GARDEN SOCIETY

VOL. 25

April, 1967

No. 2

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OUR EMBLEM

The saga of an official emblem for the American Rock Garden Society finally reaches a climax. Or to shift the metaphor, the seed planted many years ago has finally flowered into a *Dodecatheon*, a hybrid species of complex parentage.

In the early days, before the youthful society had its own *Bulletin*, there was a page in the *Gardener's Chronicle* devoted to rock gardening and the affairs of the ARGS. That page was always headed by a symbol, a stylized *Aquilegia*. A rather similar *Aquilegia* design appeared on the Gold Medals of the American Rock Garden Society which were for some years awarded to outstanding rock garden exhibitors at the large flower shows. But at no time had the *Aquilegia* been officially adopted as the emblem of the Society.

About fifteen years ago Secretary Ed Totten had an *Aquilegia* emblem designed by an artist and presented it to the other officers of the Society for possible adoption. It was decided at that time to explore other species of plants, especially those exclusively or primarily American, as a more appropriate emblem. A committee was appointed, suggestions were elicited, but no agreement was reached and no action taken. The whole matter was tabled.

There the matter rested until several years ago when Harry Logan asked at an annual meeting that the question be reopened. Naturally Mr. Logan was appointed to form a committee and to make recommendations. In order to involve the widest possible membership participation, he asked Editor Sutton to invite members to write in their suggestions for the most appropriate flower. For an issue or two the *Bulletin* was alive with these suggestions, many favoring *Dodecatheon*. *Phlox*, *Aquilegia*, *Penstemon* and *Lewisia* also had their adherents.

As a result of this selection campaign, the *Dodecatheon*, a genus strictly American, mostly of western distribution, was chosen. The characteristic shape of all its varied species recommended it as a striking and easily recognized emblem. Again to involve the participation of members, Editor Sutton invited *Bulletin* readers to submit designs of a stylized *Dodecatheon*. A number of drawings were submitted, revealing considerable artistic talent among our membership. These designs were turned over to a committee headed by Harold Epstein.

A group of the most suitable drawings was selected and turned over to an American firm which specializes in the manufacture of pins and buttons for societies and fraternal organizations. This firm combined features from several



Fig. 1



Fig. 2

of the original drawings and came up with a design suitable for an insignia. After minor revisions, suggested by the committee, the firm's design was approved. Unfortunately, it was subsequently discovered that they did not have available enamel colors considered satisfactory by the committee.

Rather than rush the job to completion without thorough satisfaction, the committee agreed to explore the possibility of having pins made in England. After a lengthy correspondence, conferences, submitted drawings, and samples, the final selection was made and pins and lapel buttons ordered.

Herewith is shown (Fig. 2), in solid black and white, the shape and design of the badge, which, of course cannot convey its charm in color. It measures one inch long by a half inch wide. The border is black enamel with the name of the Society in raised silver letters. The salmon-pink flower, green leaves, black stem, and black stamen cluster, all outlined in silver, stand out clearly against the white background supplied by the inner oval.

The badge is offered as a safety clasp pin or a screw-on lapel button. Consignments of badges are being sent to the chairmen of all the Regional groups for sale to members. In this way buyers may view the badge first-hand and select the model they prefer. Members who do not belong to an active Regional group may order a pin or lapel button direct from John P. Osborne, 29 Dogwood Lane, Westport, Conn. 06880. The price for either is \$3. An order blank will be found in the Bulletin Board for this purpose.

The shaded picture (Fig. 1) shows the emblem as it will be used for stationery, awards, and a variety of printed matter.

Thus after years of the rock gardeners' patience, the hybrid seed so long ago planted, and so long nourished has finally burst into bloom.

H.L.F.

PULSATILLA ALBA AND PULSATILLA ALPINA IN EUROPE

ING. FRANTISEK PROCHAZKA AND FRANTISEK KOTEK
Pardubice, Czechoslovakia

In a recent *Bulletin* of the American Rock Garden Society there appeared an article on pulsatillas in which it was stated that *Pulsatilla alpina* was one of the principal species growing in Czechoslovakia. This is a misunderstanding caused by a rather problematic situation as to the nomenclature and taxonomy of this species. In fact, *Pulsatilla alpina* is not a native in CSSR at all. However, *Pulsatilla alba* is.

The original species of *P. alpina* once growing in the mountains of Central Europe went through a separate development in two different branches during a long period of time. The result was two different species; *Pulsatilla alba* and *P. alpina*, which developed on the basis of geographical isolation and also under other ecological conditions. Until recently these two species were considered as only subspecies, but the works of the latest authors (botanists) rate them now as species because of their geographical isolation and good morphological differentiation.

Pulsatilla alpina (L.) DELARBE (syn. *Anemone alpina* L.) grows in the mountains of Central and South Europe—Spain, France, Corsica, Italy, Switzerland, Germany, Austria, and Yugoslavia. Generally the habitat of this species is limited to the Alps and Pyrenees.

Pulsatilla alba REICHENB. (syn. *P. alpina* subsp. *alba* (RCHB.) DOMIN, *Pulsatilla micrantha* SWEET, *Pulsatilla alpina* auct. fl. sudet. et carp., etc.) appears in Central Europe (also found in central France and Yugoslavia) so that it grows in France, Germany (Thuringen), Austria, Czechoslovakia (Krkonoše Mts., Karpaty Mts.), South Poland, Yugoslavia, Roumania, and western parts of USSR. Its habitat is, as you can see, limited to the middle high mountain ranges of Central Europe and to the Carpathians.

To differentiate between *Pulsatilla alba* and *Pulsatilla alpina* is quite easy.

P. alpina: Terminal segments of mature leaves not divided to midrib, lamina distinctly pubescent.

P. alba: Terminal segments of mature leaves divided to midrib, lamina almost or quite glabrous.

Besides these basic distinctions the species differ in other details as may be found in the following descriptions. From the point of view of a grower it is the size of the flower which is the most important.

P. alpina: Basal leaves long-petiolate, distinctly pubescent, 2-pinnate, terminal segments not divided to midrib, lobes often recurved, cauline leaves similar, but with short, broad petioles. Flowers 4-6 cm in diameter, more or less erect, perianth segments ovate, outer purplish, inner white, or all pale yellow, sericeous.

P. alba: Like *P. alpina* but usually smaller, with smaller flowers which are never yellow, terminal segments of mature leaves divided to the midrib, lobes not recurved, lamina almost or quite glabrous, flowers 2.5-4.3 cm in diameter. Usually calcifuge!

P. alpina, growing in the Alps and Pyrenees, divides into two subspecies which are quite distinct with regard to the geological basis and to the colour of the flowers.

P. alpina subsp. *alpina*: Outer perianth segments white or purplish, inner white, achenes cca 5 mm. Usually calcicole. Throughout the range of the species.

P. alpina subsp. *apiifolia* (SCOP.) NYMAN (syn. *P. alpina* subsp. *sulphurea* (DC.) ASCHERS. et GR.):

Perianth segments pale yellow, achenes cca 4 mm, usually calcifuge. Throughout the range of the species.

As it follows from the above analysis it is only *Pulsatilla alba* that appears in Czechoslovakia and that it is well distinct from *Pulsatilla alpina*. Its flowers are only white, only rarely can be found pale yellow individuals among other typical plants. This variation is of little systematic value and is also unimportant from the point of view of a grower because it is not hereditary. It is not possible to propagate it by seed and then, the yellow *Pulsatilla alba* can well be replaced by a similar deep yellow subspecies of *Pulsatilla alpina* subsp. *apiifolia*. Both species are well suitable for a rock garden. The propagation from seeds is easy and some seedlings may flower in the second year. They may be suitable for American rock gardens, not only because of their unusual beauty, but also as a rarity that can create in an American setting an illusion of European mountains!

ROCK GARDEN PLANTS OF THE SOUTHERN ALPS*

GEORGE SCHENK, *Seattle, Washington*

The Alps in this book's title are the Alps of New Zealand, which the author climbed scores of times in the company of a photographer, to gain life knowledge of all the New Zealand plants of rock garden potential. The author, Professor W. R. Philipson of the University of Canterbury, and the photographer, Mr. D. Hearn, have turned out a sparkling book, describing and evaluating some 300 plants and illustrating over 100 of them.

Prof. Philipson's lyrical gift has made this something more than a gardener's manual. He has a naturalist's eye for the total scene, and his descriptions of the moonscapes that gave rise to such things as vegetable sheep, corals and carpets, help give a logic to plants that seem to have none when they are examined out of context. Mr. Hearn's pictures are crystal sharp, technically excellent, and beyond that they capture much of the mystery of alpine plants. There is *Ranunculus haastii* forcing its succulent stems and melting-soft buttercups through a scree like diced marble. *Raoulia eximia*, the vegetable sheep, is shown as a lone, animal-sized hump of white on a mountain of grey, sliding shingle. *Aciphylla scott-thomsonii*, one of a group whose rapier leaves are often "as hard as steel and as sharp as needles", bristles before steely, needley Mt. Sefton.

This book, in words and pictures, shows a harsh land of different beauty. Its life forms are perhaps all a little frightening through unfamiliarity. Prof. Philipson presents such creatures as the clumsy keas flying in the forests of celery pines, *Phyllocladus*, to shear and eat the brilliant red cones with their sickle beaks; such places as New Zealand's fiords, where he joined in the rediscovery of the supposedly extinct *Notornis*, the flightless rail. Above the fiord's sea-arms rise sheer-sided ridges forested with *Nothofagus* trees. Eventually, by the gathering weight of growth, the trees fall, together with masses of root-held

*Published by the Caxton Press, Christchurch, N.Z., 1962, price 47 shillings & sixpence.

stones. The age-old repetition of these slides has choked the narrow valleys below with such a barrier of stones, vegetation and fallen timber that in one day the expedition progressed 400 yards. But the flightless birds were there.

The plants of New Zealand are as detached from the rest of our world as its birds and animals. Above the evergreen forests the alpine zone supports four genera of plants that are almost exclusive to these islands. They are *Aciphylla*, *Raoulia*, *Celmisia* and *Hebe*. The last three have divided into a wealth of species.

Aciphylla, whose forbidding features I have mentioned, has also a stalk of honey-scented flowers. As garden material this genus would make fitting material for a desert collection in, say, Arizona, planted among yuccas. A number of years ago the Arboretum of the University of Washington in Seattle distributed an *Aciphylla* grown from seed. Mine survived two years in the open. I think our winters are a touch too cold and wet for it.

Raoulia contains some extraordinary mounds, the "vegetable sheep", and some mats that I have heard people compare to aluminum paint, mold and sea scum. These were not derogatory comments, but expressions of amazement at seeing plants so unplantlike. I'll quote Prof. Philipson's account of *Raoulia eximia*, beginning with the reactions of the many botanists whom he has led to the plant:

"In every case there have been spontaneous exclamations of wonder. It is sometimes the mere size of the masses that is unexpected, or perhaps their clean whiteness; again it may be the rock-hardness of the surface or its intricate cauliflower-like modelling. The hard rounded surface of *R. eximia*, strong enough to resist the weight of a man and quite unyielding to the touch, is merely a crust enclosing a mass of peaty humus. Branches die away behind as they grow further upwards, leaving behind a mass of their decaying remains through which the young roots penetrate. The mass of peat is always wringing wet, even when hot drying winds have blown for days on end."

The vegetable sheep have not been cultivated with reasonable success in the northern hemisphere, not even in the British Isles, where several thousand gardeners worry and struggle with this sort of plant. The mat-forming raoulias, however, are more amenable. They grow over the ground as a film of minute leaf rosettes, dense and firm to the touch. The composite flowers are in pin-head-scale with the leaves, but they solidly cover the carpets in season, turning them bright yellow or white. We have *Raoulia tenuicaulis*, *R. glabra*, *R. australis* and another species growing in a few Puget Sound gardens, but in the San Francisco Bay region they are much more reliable.

"*Celmisia* is the characteristic genus of New Zealand's alpine scene." There are scores of species of widely differing appearance. What they all have in common are white daisies and "stout-rootstocks which divide either in the peaty soil or creep above it forming extensive mats. In either case the leaves persist for a long time even after they have ceased to function and gradually decompose into a soft water-retentive peat. The plants thus build their own root runs as they go."

"Of all the *Celmisias* those that play the biggest role in our alpine meadows centre around the abundant yet lovely *C. discolor* and *C. du-rietii*." These species have short, broadly spoon-shaped leaves grouped into neat rosettes which in turn are closely packed to form the great grey or almost white masses that spread among the tussocks. The flower heads "are typical daisies with a golden eye surrounded by white rays and though only an inch across, their abundance will whiten a whole mountain side."

Other *celmisias* have spoon-shaped, oblong or strap form leaves, often of noble dimensions. Among the smaller species, six inch *C. gracilentia* has narrow, leathery leaves, rolled at the edges and colored on the upper surface a curious

mottled mixture of brownish, blackish and purplish green, with grey veining. Three species, *C. hectori*, *C. sessiliflora* and *C. argentea*, are alpine cushion plants of perfect proportion in all their parts. The silver leaves are in tight rosettes, and the flowers are short-stemmed to stemless. *C. argentea* is the final reduction of the *celmisias*, a plant so closely hemispherical that it is like a silver *Saxifraga elizabethae*.

The author finds that all types of *celmisias* grow readily in his lowland garden in New Zealand. And in the Northern Hemisphere, Scotland has acclimatized a large number of *Celmisia* species. The Scots give them *Primula* conditions, and Scotland itself provides a protective snow cover in winter.

It would be encouraging if someone could write and tell us of success with these plants in the United States. I've had practically none at Seattle. Eight out of nine species grown from seed froze out here in a mild winter. Only *Celmisia gracilentia* stays on, a strange garden fellow with its shiny, snakeskin leaves. The cupped daisies appear occasionally.

The hebes we know much better. Under the name of *Veronica*, local nurseries offer several hebes, two-foot shrubs of rounded habit, with sprays of blue or white atop upright branches of dense, bluish-grey leaves. With their summer flowering season and distinctive leaf color, these shrubs have considerable garden value, if they are not over-watered and too shaded. After *Hebe*, any name you might wish to call them is as good as another. Their parentage is beyond the science of names.

Prof. Philipson has this to say about the *Hebe* complex:—"One complicating factor is the ease with which many of the species hybridize. The offspring of such crosses are often capable of reproducing themselves or of crossing back with the parent forms. This results in natural populations, which are already puzzlingly alike, giving rise to spontaneous hybrid swarms. This is a situation that becomes aggravated in gardens when many forms are collected together that would never meet naturally. Spontaneous hybrids repeatedly appear in these collections and often they are most desirable plants. Unfortunately many of these hybrids, both of the garden and of the wild, have been given names which complicate an already massive synonymy."

The name *Hebe* 'Pagei', however, can be accurately traced. Hart and Darton, New Zealand gardeners, introduced *Hebe* 'Pagei' more than forty years ago. Their shrub is a sterile cultivar of *Hebe pinguifolia*, which therefore has left no motley offspring to confuse its name.

Hebe pinguifolia 'Pagei' is well established in the gardens of plant collectors in the Puget Sound area. The more sun it receives, the hardier its growth. At its best this is one of the most valuable of all rock garden shrubs, forming flawless mats of year-round, blue-grey foliage, at a growth rate of about one foot annually. The mats are snowed under in June with clusters of white flowers which the bees take to avidly.

We have some other New Zealand hebes, again mostly in the hands of specialists. The famous New Zealand lilac, *Hebe hulkeana*, is rather too tender to be safe in the open here. *Hebe laudiana*, which is like a smaller *H. hulkeana*, has been successfully introduced by the Arboretum. Its constitution proves strong and hardy. Its leaves have a metallic-purple cast, and its flowers (which we hope for) are large and pinkish in flattened clusters. Violet or lilac-flowered *Hebe pimeleoides* is a thyme-like miniature. *Hebe lycopodioides*, one of the "whip-cords", forms tufts of rounded twigs covered with polished, yellow-green scale leaves in very regular rows up the stem. The popular name describes exactly the texture of the plant.

Some of the best fun in this book is meeting familiar plants in the wilds of

New Zealand. We know *Corokia cotoneaster* as a small shrub of fantastically angular twiggy, of dark olive leaves and bark. The habit of the thing makes it a natural bonsai. But we don't get all the plant has to offer. In New Zealand (and in San Francisco, U. S. A.) "*Corokia cotoneaster* forms rounded shrubs of densely interwoven branches which eventually reach a height and spread of about six feet.—In early summer the whole shrub is enveloped in multitudes of small star-shaped sulphur-yellow flowers. These are followed by an abundant crop of orange, red or yellow berries to which the specific name no doubt refers."

"The Manuka, or *Leptospermum scoparium*, is the most abundant shrub throughout New Zealand. It dominates great areas of depleted soils and is a common second growth plant where lowland or montane forests have been burnt off. Normally it is a bush or low tree with a copious display of white potentilla-like flowers. Pink and red variations occur and several fine horticultural forms are in cultivation. Large prostrate forms are excellent for tumbling over crags in larger gardens but there are also very dwarf semi-prostrate forms, either with white or coloured flowers, which must be among the most beautiful of small flowering shrubs."

"The most abundant, and most valuable of the New Zealand conifers, is the Mountain Totara, *Podocarpus nivalis*. The podocarps are mostly forest trees, but this species is a prostrate shrub which trails down, stabilizing mountainsides. It could be that many plants of *P. nivalis* are as large as a forest giant, because they seem to grow indefinitely downhill. The immense patches and stripes of green twigs so common at mid-altitudes may often represent single plants. If you part the thicket of twigs you may find twisted branches several inches thick. Since the stems root as they spread there is no need for the original stems to form thick trunks. The cordlike root systems can be pulled up from the loose detritus for many yards and the finer rootlets on them look like closely set strings of minute beads. These spherical swellings on the roots are nodules caused by a symbiotic fungus."

Podocarps are yew-like conifers of dark green needles and bright red berries. Podocarp berries are edible, while those of yews, if you've ever experimented, are like sweetened glue.

Prof. Philipson recommends plenty of space for *Podocarpus nivalis*, in the garden. But in our climate its growth averages about two inches a year, placing it among the more dwarf of the dwarf conifers. The nodules of fungus appear about the roots just as in New Zealand.

Our skilled growers of small *Ericaceae* may find every one of New Zealand's species growing in their gardens. *Gaultheria rupestris*, *G. depressa*, and *G. antipoda*, *Pernettya nana* and *P. macrostigma*, are all the heaths in this heath-impoverished land. *Ericaceae* seems to have been crowded out of living space in Australia and New Zealand by the *Epacridaceae*, plants of heath-like habit and habitat and botanically close to the *Ericaceae*.

The wiry mats of *Cyathodes colensoi*, *C. empetrifolia* and *C. fraseri*, are widespread in the rough grasslands at moderate altitude. Two of these epacridaceous heaths, *C. colensoi* and *C. fraseri*, have been growing in Seattle for more than a decade. They usually pass our winters safely and our summers vigorously. One gardener at Pine Lake has to tear up patches of the latter to keep it from getting out of hand.

We might wish that a great many more of New Zealand's plants would grow for us with this same exuberance. More often we find them on one side or the other of garden possibility. But they are worth the risk of disappointment. The beauty they possess is that of extremity, of the unlooked-for, of uniqueness in our world.

PORTRAIT OF AN ALPINE PINE

Joel W. Spingarn, *Baldwin, N. Y.*



Pinus aristata - Growing normally with ascending branches and pyramidal outline

After my article, Dwarf and Pygmy Conifers, appeared in the April, 1966, *Bulletin* of the American Rock Garden Society, I received numerous letters questioning me as to why this conifer or that conifer had not been included in the article. Of course, we all have favorites that may show off in our own particular climatic environment. Dwarf forms of *Tsuga canadensis* thrive along the eastern seaboard, but the lush healthy appearance seems to fade somewhat when seen growing south of Washington, D.C. *Abies balsamea* 'Nana' and *Abies balsamea* 'Hudsonia', when planted in areas cold enough to simulate their natural surroundings, grow very slowly, but extremely luxuriant with rich, dark green, closely packed needles. The temperate climate of Long Island seems to be the border line for growing these dwarf firs; the colder areas producing the better grown plants. Many of the variegated dwarf conifers, on the other hand, tend to fare better where the biting, below zero temperatures are infrequent. There are very few, or no dwarf conifers that luxuriate no matter where they are grown, however *Pinus aristata* seems to be able to take most of nature's whims in stride. The habit of growth is directly affected with varying climates but this denizen of the high mountain ranges seems always to maintain a handsome appearance.

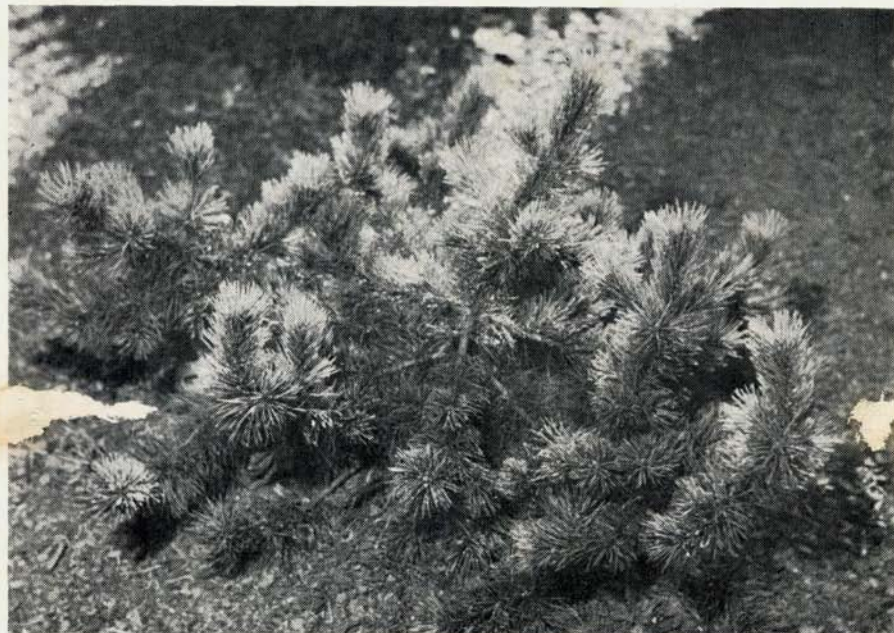
Pinus aristata is a true alpine species sometimes known as the bristle-cone, foxtail, or hickory pine and is endemic to the Rocky Mountains from Colorado

west to southern Utah and southern Nevada and northern Arizona into southeastern California. In its natural habitat, on sheltered slopes at elevations between 9000 and 10,000 feet it can reach to forty feet or more with a trunk girth up to six feet. It endures an elevation of 10,000 to 12,000 feet as a bush or prostrate creeping shrub.

In our gardens, *Pinus aristata* is hardy from fifty degrees below zero to one hundred degrees above and will grow from sea level to 12,000 feet in a humidity range as low as 3%. It does require full sun and good drainage but will thrive in poor soil. A well established plant will grow from two to four inches each year. My best specimen is about fifteen years old, 28 inches through in one direction, 35 inches through its widest section and 15 inches high. The terminal bud of the plant shown in the photograph was removed when the plant was about five years old, causing it to grow laterally. It will normally grow with ascending branches, pyramidal in outline, but is easily trained to any outline by disbudding. Its brush-like branchlets are very crowded with short, glaucous green leaves in bundles of five that are sprinkled conspicuously with dots of white resin. These leaves persist for twenty years and it is the only conifer other than *Picea breweriana* that retains its leaves for more than six or seven years.

In addition to all its attributes for gardening purposes, the bristlecone pine is known to be one of the oldest living plants. The remains of fossilized trees indicate that it existed around 2600 B. C. which predates the giant sequoias by fifteen centuries.

For some unaccountable reason, Murray Hornibrook, in his work, *Dwarf and Slow Growing Conifers*, excluded *Pinus aristata*, although it was introduced into England about 1870. Mr. H. J. Welch in his book, *Dwarf Conifers*, just published, although quite a comprehensive work, showed only a photograph of the bristlecone pine but neglected to give any description. In my opinion there is more to say about this "aristocrat" than many plants included in the text.



Pinus aristata - The terminal bud was removed when plant was 5 years old. At 15 years it stands 15" high and 28" to 33" through

DRABA TALK

A FEW DRABAS I HAVE MET

BETTY JANE HAYWARD, *Scarborough, Maine*

The genus *Draba* is large and varied, with annuals, biennials, and perennials; some tall, some short, and some in low dense cushions in the finest alpine character. Distribution ranges from latitudes of the Mediterranean region to far north within the Arctic Circle. Most are reliably hardy plants.

The relatively few kinds grown in rock gardens in America come from the mountains of Europe and Asia Minor. Doubtless there are worthy kinds native to the mountains of North America that we would welcome were they introduced.

My first experience was with the one most commonly grown, *Draba aizoon*, or one of its varieties, a plant not too distinguished, with a cushion of rosettes of pointed leaves and yellow blossoms atop stems several inches tall. It brings the first glow of yellow to the spring garden.

Then came a choice sort, *Draba olympica* var. *bruniifolia*, a true cushion plant made up of half-inch rosettes of very short leaves, obscured in spring with flowers so numerous they transform it into a perfect tuft of pure gold.

Nearby is another draba, without identity. The individual sections of the rosettes are tiny, together making a head of less than a half inch. These splay out on pedicels from the base, rather loosely, and in time of bloom display flowers of a lovely pale yellow. This is a fine companion for the golden one mentioned above.

Draba polytricha is very dwarf and grows in a tight, round tuft covered with soft white tomenta. Flowers are the typical yellow. Drainage and chips about the plant are recommended.

Draba bryoides var. *imbricata* is so tiny and compressed in form that it could be classed with other alpine alpins. It forms little close domes pressed among the chips, with tiny flowers resting on the foliage.

Draba dedeana is perhaps the best beloved. It was hard to come by. The fine hearty plants seem to have no caprice and present no difficulty. The pure white blossoms above the gray-green mats are a continuing joy.

CONTRASTING SITUATIONS

ELIZABETH PETERSON, *Seattle, Washington*

After a certain amount of experience, I have come to a conclusion about where drabas are happiest. Witness the following contrast:

On a steepish slope of sandy loam and braced with rocks to keep them from sliding down into the pool are *Draba olympica*, *D. aizoides* and *D. alpina mawii*. These plants face south and receive only bright morning sun, for in the afternoon they lie in the shadow of the house. All receive a splash or two of fish fertilizer during the summer and as much pea gravel as they can hang on to. The tiny rosettes of *D. olympica* bloom well and are seeding *in situ*, but some rosettes are pale and the clumps become bare in patches. *Draba aizoides*, with about one-quarter inch leaves, from 1964 seed has produced a few side growths, but its leaves, too, are yellowish. A gift received as *D. alpina mawii* bloomed and has produced one side growth, however its face is turning red.

In a warm area between house and fence, overhung by deciduous trees, is a different picture. The plants here are in pea gravel overlying the usual sandy-

peaty mixture overlying pure humus, on a somewhat flat site receiving filtered afternoon sun. A gift of *D. alpina demissorum*, decidedly lanceolate-leaved and blooming four inches high, is producing several side growths. *D. bertolonii* dumped in a clump from their 1964 seed pot have been scratched by the pussycats and upended by the birds. These sturdy tufts of lanceolate-ciliate leaves one third inch long have bloomed magnificently in four-inch high racemes, and are producing numerous side growths. Even my new, minute, delicate *D. bryoides imbricata* has condescended to produce a one-half inch-stem with a sulphur flower one-eighth inch across. It gives an indication of browning off in the middle, however, and will require careful watching.

Although drabas are scree plants in full sun on the mountain, it appears to me that they want a lot of gravel and partial shade and a nourishing root run in our lowland. A small piece of hardware cloth over them helps, too. *D. olympica* has been divided innumerable times, indicating vigor in its previous location. However I am looking forward with interest to see how it will react to its new environment in what has now become the "Draba Bed."

TRAMPING IN FIORDLAND

PHYLLIS WARREN, *Dunedin, New Zealand*

Fiordland is the largest of New Zealand's nine National Parks, comprising over three million acres of magnificent mountain country in the southwestern area of the South Island. The Park contains much of the most rugged and spectacular scenery in the whole of New Zealand, and one tiny corner of it (adjoining the Lower Hollyford Valley, near its northern limit) has provided us with stimulating holidays for the past five years.

The Lower Hollyford Valley is still a remote and isolated area by modern standards, though there is a single motor-road through to the Hollyford Camp where we stay. The camp was, until two years ago, virtually at the end of the road; in fact it was established originally as a road-builders' camp while the road was under construction. Previously access was only by foot or on horseback; these conditions still existed when my husband was a university student thirty years ago.

The camp consists of nine or ten wooden, iron-roofed cabins, containing basic needs in the form of bunks with mattresses, a wood-burning stove for cooking and heating, and a cupboard, table and chairs. There are communal shower rooms with an unlimited supply of hot water. What more could one ask? We take our own bedding—sleeping bags and rugs—and most of our food, but tinned food and dehydrated packaged meat and soup are available. Sometimes fresh fruit, vegetables, and bread are brought in from the nearest settlement at Te Anau, roughly 70 miles away. The nearest telephone is at the Cascade Creek Hostel 20 miles back. The proximity of many mountain peaks—the highest being over 9000 feet—renders transistor radios useless, and the only electricity (for lighting) is produced at the camp by a generator. This is a recent addition to the amenities, such as they are—kerosene lanterns were brought round to the cabins at dusk when we first stayed there—but they are not enough to attract the average holiday-maker. Hence one finds in the Hollyford Valley the beauty and silence of the world of Nature, so seldom to be found anywhere in the civilized world today; and this within eight hours motoring of Dunedin.

From this base we have tramped many tracks, and often had the grandeur of river, lake, and mountain to ourselves. One of the perfect places of this

world, unchanged by the hand of man, is Lake Marion, only two or three hours walk from the road, through the forest of mountain beech. The track rises steeply in places, and is occasionally blocked by the huge trunks of long-since fallen trees which must be climbed over, but it is not really difficult. Suddenly one emerges from the lichen-draped trees and catches the first glimpse of the vivid yet limpid waters of the lake. I have seen it the colour of indigo, but sometimes the colour of aquamarine. The lake is deep and cold and has no apparent outlet, though it is known to have one underground, and indeed the gurgling sound of the escaping water can be heard in the all-pervading silence of this beautiful place. Mountain screes rise steeply from the far end of the lake; at the near end, where the track brings us out, is a natural rock garden, carpeted with vast tracts of *Pratia angulata*. It is like walking on a thick, green, flower-studded carpet when the pratia is in bloom in the summer.

My husband climbed several of the mountains in this area in his younger days, and knows and loves this corner of New Zealand well. Our sons are gradually acquiring the same love and knowledge; for myself, the search for alpine plants spurs me on to greater efforts in middle age than I'd have once thought possible, although mountains and forests have always had a tremendous fascination.

Every trip in these mountains makes a reality of plants previously known only through books, but even the best illustrations fall far short of the beauty of the living plant. Nevertheless one is infinitely grateful to first rate books and photographs for making identification possible. An outstanding book for this purpose being *Rock Garden Plants of the Southern Alps*, by W. R. Philipson and D. Hearn.

Among the most exciting alpine plants I have seen was *Raoulia buchananii*, which we found growing on a vertical rock face just below the Homer Saddle. "The Homer cirque"—to quote from another book on mountain flowers recently published in New Zealand—"seems almost enclosed by precipices, from which avalanches have strewn masses of rock debris across the valley floor. Between huge rocks that are often covered with mosses and lichens, or stained red with algae, shelter the shrubs and herbs."

This day, early in January, 1963, was the first of our holiday that summer. We had walked through the beech and fern forest to High Falls that morning; by midday the weather was still brilliantly sunny, and since in the Fiordland mountains with their annual rainfall of over 200 inches the weather is most uncertain, even in mid-summer, we suddenly decided to climb to the Homer Saddle that afternoon. We took the car as far as the famous Homer Tunnel, nearly a mile long, blasted through a mountain of solid rock and completed only about ten years ago after many years of effort. Work on it was interrupted by the Second World War, and marred by tragedy in 1937 when engineer and overseer were killed by avalanche.

From the tunnel entrance a track of sorts is said to go up the side of the mountain to the saddle, but we did not know at that time that a track existed, and certainly it must have been far from obvious. The boys shot off up the scree and we followed. It was not difficult at first, but as we got higher and the grade became steeper, that vast wilderness of rock on all sides and towering above became oppressive, at least to me, and fatigue mounted.

Apart from *Myrsine nummularia*, with its unusual violet-blue berries, we had up to this point seen nothing new in the way of plants. There were celmisias, mountain flax, various hebes and coprosmas in the sub-alpine vegetation near the road, even some ourisias and the lovely *Ranunculus lyallii*, though this was already in seed. But the scree revealed none of its rarer beauties until we

had almost reached the saddle. Suddenly then we came across shining mats of *Ourisia caespitosa* in flower, single clumps of the exquisite *Geum uniflorum*, the fascinating *Haastia sinclairii* with leaves that seem to be made of grey-green felt, and finally there was the triumphant moment when one of the boys—always a lap ahead—called out, "What's this?" in a tone of some excitement. I was very nearly exhausted, but clambered as quickly as might be up a few more feet of the endless grey rock to see glowing greenly above my head the incredibly velvet cushion of *Raoulia buchananii*. Eventually I reached it. It not only looked but felt like velvet. I wanted to photograph it, but it was impossible to step back, the scree fell away so steeply. Soon, however, my husband wedged an ice-axe (which I use to steady myself in the steeper places) in below me, and I was able to rest one foot on the blade and so take a photo. It is cherished the more as the years go on because three times since then we have returned in mid-summer to climb again this vast scree and discover what further delights it may hold, but on each visit the weather has been dreadful, with snow down to road level, and no hope of venturing on the mountain. My only consolation is that we saw such a plant even once, for I have since spoken to people who have climbed to the Homer Saddle on more than one occasion and failed to find the elusive *Raoulia buchananii* at all. Our unconventional route to the top was perhaps a lucky chance after all.

The weather held in an almost unprecedented way that summer. The following day we made an easy all-day expedition to Lake Howden, eating our lunch beside the lake, gazing on an idyllic picture-postcard scene, thankful for the shade of some ancient beeches. Seldom have I felt so hot in Fiordland where, as I have said, it is not uncommon to have snow in mid-summer. The following year when we again visited Lake Howden progress along the track was in places like making one's way up a waterfall; and how incredibly different was the scene when we arrived—a slate-grey lake backed by snow-capped peaks and a lowering grey sky, instead of the blue and golden scene we enjoyed in 1963.

After this restful day when I was content to see only the flax and ferns growing by the lakeside (though we have found many interesting plants in the area on other occasions), I felt able to undertake another more strenuous expedition the following day. This was a climb to the Gertrude Saddle, originally planned to be the highlight of our holiday, and this it proved to be in many ways, though the alpine plants provided no thrills equal to the discovery of the *Raoulia buchananii*. To quote once more from the book mentioned before (*Mountain Flowers in New Zealand*, by Nancy M. Adams): "The Gertrude Saddle (5000 feet) . . . lies between two high mountains whose smooth granite slopes run steeply down to a tarn lying in a rocky basin. In crannies and runnels in this ice-worn rock some beautiful high alpine plants flower in the short season when the saddle is free of ice and snow. White-flowered senecios border a stream that flows from the snowfield above; ranunculus, haastia, pratia and forget-me-not grow with celmisias and edelweiss in cracks or amongst the rock debris above the tarn."

All these plants we saw, the *Senecio scorzoneroides* being the finest we had seen anywhere in the mountains. The "edelweiss" is, of course, the native *Leucogenes grandiceps*, and the forget-me-not the white-flowered *Myosotis lylalii*. They were all delightful to see, and the climb itself up that "ice-worn rock" provided thrills a-plenty. The so-called "tarn" is known as Black Lake, and to my way of thinking "tarn" is far too gentle a word for the sinister-looking and aptly-named Black Lake. I have no fear of heights as a rule, but found I could not stand without a shudder on the rock ledge which dropped sheer into the still waters of this forbidding lake.

We had started off in the early morning sunshine, but it was cold and wind-swept at this level. The wind was in fact reaching gale force and my husband considered that, despite our alpine clothing, it would be foolhardy to go on the further short distance to the saddle, since the rest of us were certainly inexperienced in such conditions. It was a bitter disappointment to us all, for the view from the saddle on a clear day is famous; the climber can see from there across many miles of mountain country to Milford Sound and the West Coast.

But once it was decided, I was more than ready to descend to the gentle herb fields which stretched for a considerable distance between the foot of the mountain and the road. Utter weariness almost overcame me again at the end of that wonderful day as we trudged on through the million daisies of *Helichrysum bellidioides*, and my one wish was that I had lived in this country and known these mountains twenty years earlier.

UNDERSTANDING OUR SOIL STRUCTURE

JOHN P. OSBORNE, *Westport, Conn.*

The first few years of a rock gardener's life is an exciting but more often than not frustrating experience. He not only has to familiarize himself with the names of the plants, but also the various soils and conditions under which they will grow.

Somewhere along the line after he has his garden built and some plants established he will become curious and want to know a little bit more about the soil.

He has heard of nitrogen, phosphorous, and potassium that are necessary for plant life, but he is aware that there is much more in the soil than these three elements.

His first bout with a book on soil science is another harrowing experience and he is soon bogged down in a mass of technical terms that become unintelligible. To get past the first few chapters requires a persistence that few of us are willing to devote to it.

I have waded through many of them and come away with a headache and a rather vague understanding of what it was all about. If you have no background in this sort of thing, it takes a lot of reading and rereading before the "why" of things begins to sink in.

To try to explain the exceedingly complex chemistry of the soil briefly and be at all meaningful is quite beyond me, but I believe that the basic concept of the structure of the soil which is of so much importance to the gardener may be explained rather simply and be of some value.

Soil consists of solid particles, water, air and a teeming population of minute plant and animal life. The solid particles are both mineral and organic. The mineral particles, mostly derived from the basic rock from which the soil was formed, are classified according to size into gravel, sand, silt, and clay. The organic matter consists of plant and animal residues. The areas between these two are filled with water and air.

Of the solid particles, only clay and organic matter are of major importance in the nutrition of plants since they are chemically active. Gravel, sand, and silt are largely inert and for the most part form the skeleton of the soil.

Clay is often thought of as simply a smaller particle than sand but it is very much more than that, for while sand and silt are roughly round and mostly composed of silicates, clays are plastic, plate-shaped particles containing minerals, water, gas, and dissolved substances. Many of the basic elements are tightly

absorbed by clay (the so-called "exchange complex"), and may be exchanged against other cations in the soil solution. The clay particles tend to cling together, however, making a solid, impervious soil. Thus sand and organic matter must be added so that water and air may penetrate and micro-organisms may do their work.

The organic substances, living and dead, include plant roots, plant and animal residues, humus, and microbes. Combining them with the mineral particles makes a tough clay soil mellow, or a loose, sandy soil cohesive. The soil's water holding capacity is thereby increased. But above all the home of the untold billions of microbes, whose action in its decomposition causes the chemical changes that make the various plant foods available, is in the organic substances. So you can visualize the soil as a skeleton of gravel, sand, and silt held together by clay and organic matter with the pores filled with water and air and the whole mass teeming with life.

The activity in the soil is almost unbelievable—more, of course, in summer than in winter, but it never stops. There is this constant working of the millions of microbes in each ounce of fertile soil.

The electrical activity of ion exchange that permits particles to move about following the attraction of opposite poles, and the never ending chemical changes brought about by these activities in the various elements make the soil a living, bustling, busy place.

Soil is in good tilth when it has a nice combination of mineral and organic matter porous enough to permit the entrance of large amounts of water and air. This would be a soil containing 10-20 per cent of clay with silt and sand in approximately equal amounts, and a fair amount of organic matter.

Does the soil in our gardens need fertilizing? It most certainly does! Visitors in my garden often ask me what fertilizer I use, and I tell them that I do not use any, but this is not strictly true. I top dress parts of my garden each year with leaf mold and sand.

Under undisturbed natural conditions elements that are taken up by the plants are returned to the soil when the plants and animals die and decompose. But in our gardens we often cut back various plants, and their tops are discarded. Plants die and are removed and in the spring we clean up our gardens and the debris is taken away so that year after year something is taken from our soil, and unless replaced, the store of nutrients is diminished to such an extent that plant growth suffers. However, if the soil you started with was reasonably good it contained all the elements to sustain plant growth, and this top dressing is all the fertilizing you will need.

Our gardens are not subjected to the conditions that are found on farm lands where crop after crop is grown and taken from the land with the resulting serious depletion of many of the basic elements that need to be replaced by more or less heavy fertilizing so that the natural balance is restored to the soil.

I believe, as gardeners, our attention has been focused too much on the need for fertilization and we have lost sight of the importance of the soil structure and how it may be manipulated for the good of the plants. Besides, inorganic fertilizers strewn upon the surface of the soil are largely wasted. To be of value they should be mixed in the soil and in a planted garden this is not good practice. The surface of the soil should be left undisturbed. Cultivation disturbs the roots of many plants and brings about the death of great numbers of microbes because of the violent environmental changes it causes.

I believe that if these basic facts of our soil structure are understood we can go about our gardening in a more intelligent way and better adjust our soils to the requirements of our plants.

LOOK AGAIN AT THE GROUND PHLOX

H. LINCOLN FOSTER, *Falls Village, Conn.*

A catchy or stirring tune, if played over and over again, soon becomes trite and annoying; so with some plants. By repetition in garden after garden even the most exciting flower may soon begin to tumble into banality and out of fashion. Moreover, there is in most keen gardeners a touch of the snob. Not for them is the ordinary and easy, lovely as it may be in its own right. And again is proved the old adage that beauty is in the eye of the beholder.

I have actually heard people say, "I hate ground phlox," or "I loathe moss pinks." What they probably mean is that *Phlox subulata* is so commonly used and so badly used that they cannot think how they could tolerate it in their gardens because of the unpleasant associations with which it is mixed in their minds. And it must be admitted that it does have some tawdry associations.

For years and years a rather dirty form of *P. subulata*, a rabid magenta which fades to a soiled raspberry, was the common form. It hung faded and limp over the edges of strawberry baskets at every wayside flower stand like a rather messy, unlaced bodice. Even today, that same tired form is being chopped up and passed around instead of being erased from the earth to make way for the finer color forms of *P. subulata* and its hybrids.

Moreover, these same glaring forms were planted in the most unnatural settings. They made unkempt rugs on untended graves, or were spotted higgledy-piggledy amidst lumpish cobblestones on those awkward embankments between the sidewalk and the house in city lots. Despite the trampling of dogs and children, the litter of paper, and the competition of dandelions and grass, the ground phlox persisted year after year with a spattering of blossoms; a monument to its vigorous determination, but a sorry travesty of its beauty.

In nature, *Phlox subulata* grows on open, rocky, gravelly and sandy slopes, generally in rather sterile soils. It ranges throughout Pennsylvania to eastern Ohio and lower Michigan, and up into western New York, and spottily in New Jersey. Acres of serpentine barrens in southeastern Pennsylvania are sheeted with blossoms in late April, a dazzling sight and in no way garish. Here there is a subtle blending of purples, pinks, and whites; rarely a harsh magenta or dirty pink. Many delicious colors have been selected by discriminating eyes both in nature and from self-sown seedlings in cultivation. Some of these, especially among the latter, are probably hybrids with some other species: *PP. nivalis*, *bifida*, and the western creeping phlox species.

During the last twenty-five years, amateur gardeners and nurserymen have selected and named hundreds of forms, based principally on flower color and size. There is also wide variation in growth habit and leaf character. It would be almost impossible to list and describe the various named clones, and it would be invidious to try to select the best. There are clones of soft lavender-blue, many of pale pink, with or without darker eye-markings, deep pinks, red-purples (with 'Scarlet Flame' almost a pure red), also some fine pure whites; these last sometimes with eye-markings of various colors. That all of these have been easy to perpetuate by simple division or cuttings means that they pass from garden to garden and from nursery to nursery with consequent confusion in names, or loss of names, and rechristenings.

Starting with a selection of named sorts with a range of color it is possible to reproduce from seed just about any color variation that has already been

named, and many that have not. After raising several thousand seedlings I have found that just about the whole range of color possibilities has been exhausted, without the introduction of new genetic material from other species.

For ease of culture, ease of propagation, and for flower display there are very few plants superior to *Phlox subulata*. It may be used as a single brilliant splash in the rock garden, as a tapestry of various shades on a steep bank, or as a carpet draped over a soil-banked retaining wall. It has the added advantage of forming a dense evergreen turf when out of flower.

If used in the rock garden it should be so placed that it does not over-run frailer, smaller plants; yet it may be restrained as vigorously as you wish by clipping back the mat after flowering. Moreover, there does seem to be a maximum limit to the spread of a single plant even if permitted to root down along the ground-hugging stems. Maximum size may be up to three feet in diameter, but generally less, and in some forms not more than one foot.

Plants with dense, restrained growth habit, with bright, clear-colored blossoms, and with full, rounded petals are still the ideal. Though there are forms that approach these qualifications, there are still many possibilities open to those who wish to explore further the genetic variations in this species. Of even greater potential is to work toward hybridizing a phlox which combines the ease of cultivation of *P. subulata* with the tight bun habit of the phloxes of western United States.

Two sub-species of true *P. subulata* are found south of the species range; *P. subulata australis* and *P. s. brittonii*. The former differs little from the species except in technical details in the glandularity of the inflorescence. The latter has come into gardens as *Phlox brittonii rosea*, and a very charming plant it is. It forms close, rather hard cushions, with the short needle-like leaves tight upon the radiating stems. The flowers of pale pink are somewhat starry in effect with each of the five petals conspicuously notched.

It is possible that the cushion phloxes which have been developed in England and named "Douglasii hybrids" contain some genetic material from *P. subulata*, but this is uncertain. They do have a tight cushion growth similar to some of the western phlox, such as *P. douglasii*, but they do root down along the stem and are easily propagated by division. This characteristic is a feature of *P. subulata*, but not generally of the westerners, which tend to spring from a single taproot.

There are, however, two definite hybrids of *P. subulata*, both choice plants for the garden. One is a cross with *Phlox bifida*, the Prairie or Ten-Point Phlox, a native to the country south of Lake Michigan. This species has long, pointed leaves on the rather erect stems which grow from a central root-stock. The tall cushion of the plant is a solid mound of color as the blossoms open in early May, each petal so deeply cleft as to appear like two. In nature this species is generally white-flowered, but there are occasionally good light blues with no taint of purple. A hybrid of a good blue clone of *P. bifida* crossed with *P. subulata* has produced *P. x 'Millstream Jupiter.'* This is a prostrate plant, rooting sparingly along the stems, like *P. subulata*, but with long and relatively broad, pointed leaves. The flowers are a strong lavender-blue, large and deeply notched.

A plant known for many years in the nursery trade as *Phlox amoena* is really a hybrid of *P. subulata* and *P. stolonifera*, and should be called *P. x procumbens*. There is a true *P. amoena* of quite different habit and probably not in cultivation. The hybrid, which has been grown for many years, carries cluster-like heads of *P. stolonifera* on clumpy, non-stoloniferous plants, with flowers of purple-pink. This same cross has recently been repeated, using light-colored *P. stolonifera* with the result that the flowers are a clear, true pink. This clone is

known as *P. x procumbens* 'Millstream.' It forms an open mat of rooting runners with leaves combining the features of the two parents. It has a long blooming season through the month of May and will grow in either full sun or light shade.

Since this cross between *P. subulata* and *P. stolonifera* has occurred more than once, it is to be hoped that eventually *P. subulata* may be crossed with *P. adsurgens*. Because *P. adsurgens* belongs in the same section as *P. stolonifera* this should not be an impossible hybrid, and has great potential. The hardness and ease of *P. subulata* combined with the habit, flower size and flower color of *P. adsurgens* would be something very desirable.

When Reginald Farrar wrote in *The English Rock Garden*, "The day that saw the introduction, more than a century ago, of *Ph. subulata*, ought indeed be kept as a horticultural festival," it is a real accolade from a man who had little praise for most American plants. How much more would *P. subulata* merit his acclaim today, since the introduction of superior forms and hybrids which in 1919 he could not have known.

BOOK REVIEWS

FLOWERS IN THE WINTER GARDEN, by M. M. Graff. 203 pp. and 8 colored and 8 uncolored illustrations Doubleday & Co., Garden City, New York, 1966. \$4.95.

Why should a book with such a title be reviewed in this *Bulletin*? Actually, most of the flowers discussed in it are "rock garden plants," and in Chapter 1, "Starting from Scratch," there are many helpful recommendations as to rock garden construction and maintenance. Mrs. Graff's felicity of expression and delightful sense of humor which pervade the book are well illustrated by her advice on page 5 that when using "small rocks, it is essential to keep strictly to one color and type. A common mistake is to combine weathered boulders, freshly blasted rock, pink granite, pepper-and-salt aggregate, and stone glinting with mica. Instead of suggesting a natural rock formation, the result is a dump."

The plants discussed were grown by the author during a period of over 20 years in the New York region, and bloomed during the cold third of the year; the genus *Crocus* receives most attention, but *Galanthus*, *Iris*, *Narcissus*, etc., as well as shrublets and herbaceous perennials are also well covered. The importance of buying these under their technical names is emphasized. Throughout the book the greatest care has been used to have the nomenclature authentic, with conspicuous success.

As usual, the reviewer promptly looked in the index—in which, by the way, alphabetization is sensibly by nouns rather than by the adjectives favored by too many horticultural writers—for *Phlox*, and found it appropriately in the chapter on "Summer Dress for Winter Bulbs." The widespread, doleful, faded, magenta *Phlox subulata* is dubbed "Gas Station Pink . . . one of the blights perpetuated not by seed, but by handouts, like unwanted kittens." However, its owners "liven it up with taxicab yellow *Alyssum saxatile* and scarlet tulips," hailing the result as a "Riot of color, a term non-gardeners consider complimentary."

The sparsity of illustrations is regrettable, but is partially made up for by the apt descriptions of hundreds of little-known species and cultivars. When the author likes one of these there is no doubt about it, thus: "*Narcissus triandrus albus* is a meltingly lovely flower, frail-looking, feminine . . ." But on the facing

page a dislike is manifest: "The Lent Lily of the poets may have beauty when seen by the meadowful, but it is a bedraggled thing on close inspection. With drooping neck and a lank perianth hanging in its eyes, it looks as if it had been caught hatless in a cloudburst."

This book, then, should be in the library of every rock gardener. If they are located too far north to accomplish much of the blossoming described, the charming characterizations in it read during the cold season will serve as consolation. But if in milder climes, the cultural and other directions given will prove of real benefit.

EDGAR T. WHERRY

THE OXFORD BOOK OF FLOWERLESS PLANTS. By Frank H. Brightman. 208 pp., 688 plants illustrated in color by B. E. Nicholson. Published by Oxford University Press, Ely House, London, England, 1966. Price \$10.00.

Books previously written on flowerless plants have been highly technical, written for the scholar rather than for people who find pleasure in identifying the living things around them. *The Oxford Book of Flowerless Plants* fulfills the need for such a non-technical work, yet retains a scientific excellence. Each species described is beautifully illustrated by detailed color drawings. The brief descriptive paragraphs are arranged opposite the color plates for ease of identification.

The following five groups of plants are included: fern and fern allies, mosses and liverworts, fungi, lichens, and seaweeds. They are grouped together in an ecological manner including the Seashore, Grasslands, Uplands, Wet Places, and Woodlands. Anyone finding himself anywhere in the countryside in Great Britain can easily identify the members of these plant communities and learn the relationship of one to another. Although this book is written for the layman in Great Britain, many species illustrated and described may be found elsewhere in the world.

There are in the book brief discussions on the classification of flowerless plants, and on associations between these plants, and a bibliography of suggested reading for those who wish to study the subject further.

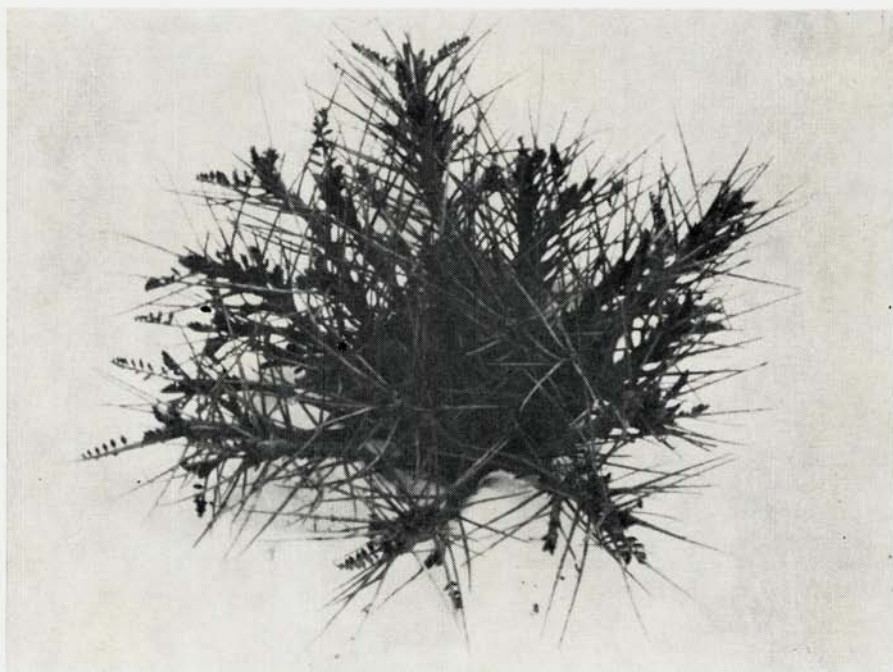
For the rock gardener, only the ferns and club mosses would be applicable in terms of horticulture, however for those who wish to enhance their knowledge of the plant life around them, this is an invaluable book. The exquisite illustrations tend to open one's eyes to the tiny living things that might otherwise go unnoticed, and to deepen one's appreciation of the intricate make-up of all living things. This book would be a valuable reference for field trips and a handsome and useful addition to any home library.

SALLIE B. ALLEN



SOME SHRUBLETS OF THE GENUS *ASTRAGALUS*

VLADIMIR VASAK, *Pruhonice, Czechoslovakia*



Astragalus angustifolius in early spring showing distinct spiny petioles

In the literature of gardening we often meet with the assertion that various species of the genus *Astragalus* are so difficult in the garden that the fact that they are nice, unusual, quite rare and have decorative value does not compensate for the trouble it takes to grow them. Perhaps only the experienced gardener will be attracted to the astragali because of this difficulty.

These plants, about which I'll write, are most often seen in Europe in rock gardens of various Botanic Gardens. One is *Astragalus angustifolius* Lam. (syn.: *A. leucophyllus*). At Dresden in DDR is the wide, very old clump of *Astragalus angustifolius*, used as the center, the main point of the whole alpinum. In bloom it is very showy; its white flowers shining on the base of the bristly and spiny cushions.

This plant is interesting and decorative even in the early spring, when amidst last year's bristled, spiny petioles are shown the new leaves, narrow and pinnate, of a lovely vivid color. During the whole year this beautiful plant shows us how attractive are its habits.

Although I grow it in very deep and good soil, the habit of this plant is not less nice than in its natural condition. Three year old plants grow into hemispheric, cushion-like clumps and bloom. The clumps are about 50 cm across and 15-20 cm high in the middle. *Astragalus angustifolius* grows in the wild on rocky slopes in the mountains of Greece, on Crete, on isles in the Aegean Sea, in the coastal areas of Asia Minor, in Albania, Yugoslavia, and in Bulgaria. In gardens it has been cultivated since 1910 (Rehder).

The second species, *Astragalus sempervirens* Lam. (Syn.: *A. aristatus* L'Herit., *A. tragacantha* Vill. non L., *A. pseudotragacantha* Ten., *Phaca tragacantha* All., and *P. aristata* Clairv.) is an interesting, low-growing, cushion-like, spiny shrublet with very decorative whitish or pale pink flowers. It is rich in nectar and usually it produces seeds in abundance, and flowers if pollinated by bees and bumblebees. In rainy summers there are often cases of self-pollination. As the Latin name suggests, it is always living, the leaves survive the winter. The blooming period of *A. sempervirens* is very long. When the first flowers on some of the branches are followed by ripe seed pods, on other branches other flowers are just opening and on the tips of the younger branchlets are to be seen new buds.

This plant inhabits banks and stony slopes, always on limestone, up to 2700 m.a.s. in mountains from Spain to Greece in the Mediterranean area (Ascherson, Christiansen). Rehder reports this plant in cultivation since 1914.

The third one is a good small plant coming from Asia. I do not have it now as I lost it in our wet winter. But I do have a nice color slide as a fine souvenir of its beauty. I appreciate very highly this beautiful gem among astragali, which I have raised from seed, though I have no seeds of it now. It is *A. lasiosemius* Boiss., a branching, spiny shrub about 20 cm high, making a not too dense clump, with new branches densely covered by whitish hairs, with leaves composed of 6-10 pairs of narrowly ovate leaflets, and with large, bright yellow flowers.

It appears in flower, in our country, in June and July. Seeds I do not have on my plant. It must be pollinated by pollen from other flowers and our kind of bumblebees seem not to be able to fertilize these flowers which in nature seem



Astragalus angustifolius in full leaf

better suited for pollinization by night butterflies. *A. lasiosemius* is widespread in large areas in southern and western Tian-Schian, in Pamiroalai, in Afghanistan, where it grows on dry mountain slopes at elevations from 2400 to 3400 m.a.s.; on steppes in association with various species of *Ferula*, *Prangos*, and in formations of *Juniperus* and *Rosa*. My specimen I raised from seeds which were collected in Tian-Schian by workers of the Botanical Gardens at Tashkent.

The fourth is *Astragalus aureus* Willd., (Syn.: *A. pseudotragacantha* Pall. p.p., *A. macropodius* Fisch.), a spiny shrub to 30 cm high, spreading or matforming. Its tiny branches are covered by old spiny petioles. Flowers are arranged in bangle-like inflorescence containing 4-6 flowers of a rich gold color in the leaf axils. It inhabits dry and stony mountain slopes in Iran, Asia Minor, and an area of Caucasus (Grossheim), where it lives at elevations from 2000 to 3000 m.a.s. In its native areas it is exploited as a source of tragacanth although it is not the best plant for this use. Nevertheless, it is a very nice plant for the rock garden.

The fifth of these shrubby astragali is *Astragalus lagurus* Willd., (Syn.: *A. brachypodus* Boiss.). It makes dense, very compact clumps to 30 cm high, above which on 20 cm stems are ovate inflorescences quite resembling a hare's little tail, as the botanic name suggests; flowers are pale rose or pink. Beginning of flowering in our country is in July. This plant, whose leaf midrib is spine-tipped, inhabits arid stony slopes at elevations of 1400-2400 m.a.s. in Asia Minor, in northern Iran and Armenia. In 1962 I had my first flowers on three-year old seedlings, but in the winter of 1962-3 I lost it. Again this year I have flowers. For the past three years I have grown this plant in a relatively moist submountain area in northern Moravia.

The last three species, *AA. lasiosemius*, *lagurus*, and *aureus* are in their areas quite truthfully pasture weeds, but in our rock gardens we need not be afraid of them. Most probably we'll have many difficulties in retaining them in our rock gardens.

Today I have written only of five species, all of which I have raised from



Astragalus aureus - A taller, golden-flowered species

seeds. They have all flowered for me under my garden conditions. Of many other species, which I now have as young plants, I want to write later. But in any case I would like very much to recommend the genus *Astragalus* to all alpine gardeners who want to try some unusual and very satisfying shrublets.

Now, a few words on the culture of the astragali: Seeds of these plants are "hard" and usually germinate very badly. They must be scraped before sowing. The scarification can be made by a very sharp knife, needle, or with smaller seeds by using glass-paper. Such prepared seeds come up in a few days. These plants, grown from the beginning in pots, must be planted out in the garden where they are to stay. Most suitable are sunny places with light soil (a large part of sand is recommended!) in the neighborhood of rocks. The cushion-like species will be most grateful under such conditions.

Older plants may not be transplanted as they have very strong and deep roots. *Astragalus angustifolius* can be propagated by cuttings in August.

If this short article evokes an interest in growing any of my lovely shrubby astragali, I will be very pleased.

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NOTES FROM THE NORTHWEST

ELIZABETH PETERSON, *Seattle, Wash.*

MUSHROOMS ARISE!—It would seem affiliation with wild flower societies is inevitable in view of the fact that rocks, cliffs, and alpine meadows merge with each other on mountains, and a "pure" rock garden on a small property could become monotonous. Now appears another earth feature, with societies devoted to it, which beckons us: the fungus. We were treated to an evening of "Fascinating Fungi" by Mrs. Albert Brauss. The topic might well have been entitled "Op Art" or, better yet, "Expressionism in Nature." The slides shown opened up a whole new world of photographic and architectural possibilities. One slide especially could have graced a living room wall. This took in a clump of orange and beige-colored mushrooms, grays to blacks of a tree trunk, and the pinks, oranges, and greens of fallen leaves, all arranged in a free, informal pattern.

There were shown vivid yellow pagodas clinging to a tree, startling white stag horns rising from the earth, gray-brown coolie hats waiting to be used, scrambled eggs cooked in nursery pots, tall brown and white "Beatle" mops, and lemon-colored umbrellas. Variations in shape and color were enormous, with Boston cream pie, oyster shells, pine cones, bright red poker chips, and a mushroom called "Witches Butter" which looks like a jellyfish vying for attention.

Mrs. Brauss did not dwell at length on the edible aspects of mushrooms, not wishing to be responsible for the demise of rock gardeners; she did indicate, however, that robins and squirrels eat several fungi which would harm humans. Further it was revealed that not only do slugs eat mushrooms, but these fairy creatures dine on one another. One slide showed a black mushroom being eaten by a white one, something which will no doubt horrify believers in white knights. A tentative generalization might state that the more attractive the mushroom is, the more inedible. A slide illustrating this was of the deadly *Amanita*

muscari, appearing as a brilliant red jewel ornamented with cream polka dots.

Fungi watchers are a very active group—they have to be to walk around bent over for hours; and the Puget Sound Mycological Society presented this year its third annual display consisting of more than 200 species of mushrooms. Mrs. Brauss mentioned that the camera often picks up details not noticed by the human eye, and told of a cream mushroom which appeared to be uniformly round. A slide of it revealed trifid protrusions spaced along its edges.

For photographers there are now two important dates to put on the calendar: October 1, to start seeking out earth fungi, and November 1, to raise one's camera, and one's back, toward the tree types. And for all of us there is the added excuse to make more field trips in the autumn.

IF NO SEEDS, THEN WHAT?—The Heather Meadows of Mt. Baker, in Washington, near the Canadian border, for seed collecting forays are always a gamble. This time, due to a late snow pack, we lost. The intermittent sprinkle and clammy fog predisposed some of the six or so assembled families to eat a hasty lunch and depart. For the more intrepid members there remained enough of interest to brave soggy clothing and limp sandwiches. Two members when asked if they were finding anything of botanical interest, gave evidence of *Vaccinium deliciosum* by sticking out their blue tongues. A rare pleasure that day was the subdued whisper of the mountain and the exquisite Japanese effects of grandiose trees disappearing and reappearing through the swirling silvery gray mist.

A beginning gardener finds at the meadows a superlative source of inspiration for landscape design. There is a glacier-worn, shiny black boulder the size of a football field and bare of vegetation, reminiscent of a huge New England outcrop; and there is also a stark talus slope of immense proportions. Many sunken pools appear, rimmed with low verdure, in which are reflected one or two majestic forest monarchs. At home, a tiny pool, one perfect tree and a rim of *Arenaria verna caespitosa* could duplicate this earthly beauty. Or, the rim could be of the tiny, clumpy *Epilobium alpinum*, found in plenty, either as a margin to bogs or nestling in wet rock hollows. This dear fireweed, about three inches tall, produces decumbent stems of glossy, oval, opposite leaves and a branched pedicel which carries a four-petaled flower of variable pink. It is a happy plant in our gardens, but subject to mildew in too moist shade.

The Forest Service has done an exceptional job of adjusting picnic grounds to the rolling slopes. The paths, paved with soft basalt bits and gravel, follow the contours of natural depressions and lead to gravel-paved, irregularly-formed circles of the individual picnic sites. Why not a graveled picnic area in one's own back yard in the midst of the rock gardens? The sunken paths are edged with columnar pieces of basalt, set erect, over which hang billowing mounds of *Luetkea pectinata*, much like aubrieta overflowing English garden walls, a landscape use of native material not hitherto seen by our members. The edgings serve to retain slightly higher miniature meadow clumps where intermingle the cassiope and the phyllodoce "heathers." Another shrub appearing infrequently in these clumps is *Spiraea densiflora*, whose shade of pink is difficult to reconcile in the home garden with other than quiet evergreen shrubs. The color "carries" a long way.

An almost overlooked monotypic member of the Ericaceae, *Cladothamnus pyrolaeiflorus*, the Copper Bush, hiding among the meadow shrubs can be discovered when in bloom, or in seed, by the noticeable curved anthers in its bells. This 3-5 foot deciduous bush is coppery throughout except for its oblanceolate leaves in whorls which are covered with white hairs in youth, becoming glabrous in age. It makes a good garden neighbor in rhododendron woods.

There are among the black rocks isolated patches of flat *Saxifraga tolmiei*

and variable-sized *S. ferruginea* (?). *S. tolmiei*, in loose screes, forms rosettes of minute, glaucous, succulent, obovate leaves from the center of which rise single flowers of five white petals evenly interspersed with five sparkling yellow-green calyx lobes, in a sunburst design. After the petals fall, the calyx lobes remain to protect the forming seed group which develops into a deep red elf's cap. The same plants, occasionally nestled in vertical crevices, tend to develop runners, lined with alternate leaves, which search for a place to send down roots. This tiny wildling has yet to be tamed in the garden, although one member reports germination from seed collected last autumn.

The other saxifrages have evergreen rosettes of generally spatulate, dentate, fleshy leaves 1-2 inches long, often tinged purple, and a panicle of white-petaled flowers which form bulblets. These drop to the ground and form new plants where they find root room. These plants do well anywhere in the garden, although in hot sun they tend to roll themselves into grumpy, sunburned balls; in shade the leaves are longer and greener.

Numerous chattering rills bounce over large rock chunks, being bordered by yellow *Mimulus tilingii* which is immediately identified by its red-dotted throat. In the garden the mimuli are lovers of partial shade and moisture. The meadow rocks are mantled by the most beautiful yellow-green moss imaginable, encrusted with crystalline drops of water unexcelled by any cut diamond. Only the lupines seem to have this ability to hold one perfect drop of water.

One breath-taking feature of the meadows is a black talus slope of angular basalt whose only adornment is lacy, chartreuse *Athyrium alpestre*, a small sister of the Ladyfern, whose triangular shape emphasizes the square cut of the basalt. The rhizomes curl in corners between the rocks under which inspection discloses soft black mud. It is a fern for partial shade and scree in the garden.

A concrete example of the importance of simplicity in garden design is provided by these acres: uniform rock; adequate space between plant clumps, the space being mulched with a material complementary to the rock; isolated shrub meadows; natural ground contour; harmonizing foliage pattern with an occasional startling contrast; and a container of water, no matter how small, to provide the essential textural alternate.

RARA AVIS:—An evergreen shrub to challenge (and presently little known in America), *Philesia magellanica (buxifolia)*, was "First in Show" at the member's slide night, held recently. This liliaceous plant's name derives from the Greek *philien*, to love, and is worthy of its name. Though two feet tall in its native Chile, it grows six to twelve inches in cultivation. The plant is coveted not only for its stiff branches carrying somewhat erect, oval, deep green leaves, whose backs are gray, but for its flowers. These are spectacular two-inch long, deep rose tubes created by three petals which overlap at the base. It is a tender shrub (perhaps seen at its best in California), which can be grown in a mild climate with protection, in moist, leafy, acid soil. From Cornwall, England, the shrub is reported to grow well with its feet in shade, its head in the sun, and its limbs protected from wind. If this graceful beauty likes you, it will produce rooted suckers for continued propagation in case of loss.

Dryas tomentosa from the Rocky Mountains may be more familiar but very rewarding with flowers of seven to eight yellow petals which form a shallow bowl atop 3-4 inch stems. The little evergreen crenate leaves, green above and gray-tomentose below, have prostrate woody stems which creep equally as well as the other dryas, in loam and partial shade. The yellow provides a nice accompaniment to the popular white *D. octopetala*, both bearing fluffy seed plumes. *Dryas*, of the Rosaceae means "wood-nymph" and the southernmost station of *D. octopetala*

is listed at Mt. Rainier, Washington, How far south do they grow in gardens?

WEIRD AND WONDERFUL:—In January, through the courtesy of the West Australian Wildflower Society, we were shown colored slides of the most erratic, spectacular plants to exist outside of Mars. The pleasure was somewhat dimmed by Dr. Arthur R. Kruckeberg's announcement that most of these plants are tender at forty-five to fifty degrees above, although a few may be raised in home greenhouses. He reported that half of the subjects shown came from the area around Perth, where average annual rainfall is fifty inches, and the others from deserts and mountainous areas starting at about 2,600 feet. Many of the plant families are termed primitive in evolution by the botanists, and though some have relatives on other continents, there are whole genera confined to the western part of Australia.

Several plants specialize in stamens, and surely the most "pattable" are those of the genus *Banksia*, named for Sir Joseph Banks, father of Australian botany, although a ladder would be needed to pat some of them. These, in some forms, resemble coarsely dentate, wide or narrow, thistle-like leaves, from the center of which sprouts a fat cylindrical head of stamens in Pucci-like colors. Plants of the genus *Callistemon* have bottle brush stamens packed in spikes, above and below which are the petals whose colors vary from yellow and pink through the range of reds. Among the Liliaceae are plants called Donkey Ears, Duck Orchids, and there is a Spider Lily, a remarkable golden spider with perhaps two-inch long waxy white legs. Its name is *Caladenia pectinata*.

There are ninety-three species of *Stylidium*, the Trigger Plant, whose characteristic feature is a long curved style which pops open when the flower has been fertilized. There are Amaryllids, too, famous as Kangaroo Paws, one of which is *Anigozanthus preissii*. It has a three-foot lance leaf whose inflorescence, covered with red down, carries laterally what appear to be green bracts in the shape of lobster claws.

The genus *Pimelea* is represented, the most obvious being *P. spectabilis*, which is four feet tall with the usual beautiful evergreen ovate leaves in whorls of four, and a host of white terminal clusters. *Conospermum* makes another field of white, resembling a crowded patch of *Sedum album* in bloom in which nothing is to be seen but expanses of what appear to be white blankets laid out to dry. In the berry world is a Sandalwood, an erect, leafless *Exocarpus sparteus*, carrying translucent, rosy-red fruit. A dwarf hardwood shrub of thin stems and minute, awl-shaped leaves is *Boronia elatior* whose rosy-carmine, drooping bells are reported to have a delicious scent.

Of the Myrtaceae is *Darwinia meeboldii*, endemic to the Stirling Range, of two-foot stems covered with closely adpressed leaves, which bear white, pink-flushed pendant bells. Other colorful evergreen shrubs, with heath-like leaves and tubular flowers, are *Leschenaultia formosa*, a stunning scarlet, and *L. biloba* of a transparent blue. An ethereal blue is found in *Conospermum amoenum*, popularly called Blue Smokebush. More smoky trees and shrubs are found in the genus *Grevillea* whose woolly, minutely dissected leaves lead to terminal clusters of tiny tubes outstripped by many long stamens. Not smoky, but perhaps the grandest of all is the Christmas Tree, *Nuytsia floribunda*, which erupts along its branches in the manner of a cherry, with a flow of masses of startling yellow. It is reported as being parasitic.

Well, these plants are nice to dream about in the middle of winter gloom. A note to tourists: the King's Park in Perth, Australia, features a collection of their native plants—or you can visit southern California for a view of some of these weirds and wonderfols for some of them are grown there.



SO MANY SEDUMS!

(Editor's Note)—From the New York State College of Agriculture, Cornell University comes this note on the Genus *Sedum* as prepared by Kay Barnes, Ithaca, N. Y.)

One of the largest collections of live sedums in the world is located at Cornell University.

Sedums are fleshy, succulent herbs found in the north-temperate zone. They grow in large numbers in mountainous regions and are also frequently cultivated in gardens.

Prof. Robert T. Clausen, botanist at the N. Y. State College of Agriculture, Cornell, has 1,908 plants collected from the United States, Canada, and Mexico; 435 now growing outdoors, 588 in cold frames, and 885 in Cornell greenhouses.

In addition to the large collection of growing plants, the botanist has added to Cornell's large collection of dried specimens in the Wiegand Herbarium.

Clausen said plants vary from those with small root systems found in shallow soil to other species having extensive root systems with more of the plant underground than above ground. Some varieties are found growing on rock, seemingly with no soil, and often are called stonecrops.

Thirty-one years ago, Clausen was assigned the task of identifying and classifying sedums in Cornell collections and in nearby gardens. To do the job accurately and determine the relationship of plants to each other, he found he had to study the plants in their natural settings.

Early in his work he found that sedums will grow readily from small pieces of stem or even from single leaves. He has put this information to use by growing specimens at Cornell that he has collected from all over North America.

In this way he can determine whether differences among similar plants are due to the plant's ability to adapt to its growing conditions or whether it actually is another species.

Clausen has received assistance for his collection trips from the National Science Foundation. The past summer he covered the central Rocky Mountain states of Wyoming, Idaho, and Montana.

He also has made collection trips to the Columbia plateau region, the northern Cascade Mountains, the southern Rocky Mountains, Pacific Coast ranges, Sierra Nevada Mountains; all in the United States. In Canada, the

northern side of the Gulf of St. Lawrence and regions in Alberta and British Columbia have been searched.

His book, *Sedum of the Trans-Mexican Volcanic Belt*,¹ has been published as a result of his trips to this area which extends from the Gulf of Mexico to the Pacific Coast in Mexico.

Clausen makes his collection trips to coincide with the time sedums are in bud and flower. He notes the geographical location, the extent of the area, and the number of plants.

Also, he records the exposure, soil type, drainage, acidity of the soil, and other kinds of plants growing in the area. The floral parts are measured, pictures are taken, buds are collected for studies of their chromosomes, and small pieces of the plant are taken for growing back in the Cornell laboratories.

These data aid Clausen in his task of tracing the genealogy of the 360 species of sedum that are known to exist.

The accompanying photograph shows Prof. Robert T. Clausen holding a plant of *Sedum spathulifolium* ssp. *pruinatum* grown from a small stem collected from the bluffs by the Pacific Ocean at Bandon, Oregon.



Vesicaria utriculata in flower

VESICARIA UTRICULATABURR B. BRONSON, *Watertown, Mass.**Vesicaria utriculata* in fruit

Virginia Howie

At the time of our 1965 American Rock Garden Society meeting many members visited our garden. We had one plant about ten inches high with spikes of yellow blossoms, the tops of which were just beginning to go to seed. The seed pods proved to be as interesting as the flowers.

We had never been able to identify this plant, and none of our visitors knew what it was.

Dr. Edgar T. Wherry agreed to attempt identification of this plant, but recently wrote, "After several unsuccessful attempts at 'running it down' in diagnostic plant keys, I finally decided to call for help upon my friend Dr. Reed C. Rollins, of the Gray Herbarium, who specializes in the Cress family. He has placed it as *Vesicaria utriculata*, also known as *Alyssoides utriculata*. It is a native of southeastern Europe and the Balkan region, and is apparently not generally known in cultivation in this country, not being in Bailey's *Manual*

of *Cultivated Plants*, although another species is noted in his *Cyclopedia of Horticulture*."

I had expected to have a limited amount of seeds for the Seed Exchange, but so many gardeners have requested them, there will be none available this year. The drawings that appear with this item show this plant in blossom and in seed.

INTERCHANGE

A DOCILE DWARF—In a letter from Maj. Gen. D. M. Murray-Lyon, our good Scottish friend, he wonders, "if you out there (Pacific Northwest) have the prostrate form of the California Red Wood." He goes on to say, "It is one of the plants which always seems to catch the eye of visitors to my garden. It is quite prostrate and occurred as a 'vegetative mutant' at Cambridge Botanic Garden—*Sequoia sempervirens prostrata* 'Cantab.' It is said to sometimes produce vigorous erect shoots which have to be removed. So far, however, mine has behaved itself and remained prostrate."

A TEMPERATURE CORRECTION—Mr. Vladimir Chaloupecky, whose article, "*Cypripedium calceolus* in Czechoslovakia" appeared in the October, 1966, Bulletin has written to say that a mistake was made in the matter of temperature. He writes, "Localities where *Cypripedium calceolus* grow have an average yearly temperature (i.e. the average of all temperatures per year) from plus 7 to plus 9 degrees C., ranging in the extreme daily values from plus 30 degrees C. in summer to minus 20 degrees C. (or even less) in winter. If the temperature should be, as it was printed (plus 7 to minus 9 degrees C., it would be unusually steady, but the place would be horribly cold."

EPIPACTIS HELLEBORINE—After reading about the antics of this plant as set forth in a recent Bulletin, Mr. H. Lincoln Foster tells of his experiences. "The article about *Epipactis helleborine* brought back ancient memories. I remember my first discovery of it in the 1930's and chasing it down in Eaton's book on the American orchids, where he spoke of it as *Serapias helleborine*, the rarest American orchid. I sent a specimen to Gray's herbarium at Harvard and had a letter from Fernald verifying the identification, pointing out, however, that the plant was apparently identical with *Epipactis latifolia* of Europe, and had probably been introduced accidentally into this country, probably once in eastern United States and once outside Montreal, Canada, and that, at that time, it had already been reported as far away as Missouri. It constantly crops up here in my garden and in the woods, but never makes a particularly striking specimen. It seems short-lived, subject to leaf and blossom distortion, and is a favorite food of deer and cows. Like all orchids it transplants very poorly, and it is hardly worth it anyway, though I have seen magnificent plants up to three feet tall with rather deep purple, mottled blossoms in a very full spike."

SPIGELIA MARILANDICA—WHO CAN SEND SEED TO AUSTRIA?—A young Austrian gardener, Fritz Kummert, whose address is Hauptstrasse 61 A, A—3001 Mauerbach, Austria, needs seeds of this American plant for his collection. He made his needs known in a letter to Mrs. Waide E. Gillman of Pittsboro, N. C., who thoughtfully forwarded it to the Bulletin editor for action. She states that the plant seems not well known, but that it is mentioned, not too enthusiastically, of course, by Reginald Farrer in his *English Rock Gar-*

den. Will any member having knowledge of this plant please communicate with Fritz. If you can send seeds and cultural directions he will be grateful.

DIANTHUS AND CAMPANULA—A rather new member, Mrs. William McL. Ittmann, 9450 Whitegate Lane, Cincinnati, Ohio, 45243, writes that she is trying to prevail over the somewhat trying middle western climate and is interested in information about the culture of Dianthus and Campanulas in her area. She has asked for the names of the best books dealing with these two genera. Can you help her? Concerning her experience with them in Cincinnati, she writes, "Both do rather well here and I am trying every possible variety with moderate and always exciting success."

SEEDS—From Czechoslovakia Mrs. Olga Duchacova writes, "We are still extremely busy with seeds; seeds are arriving and are dispatched; seeds all about my rooms, about 600 pots with seeds in our alpine house, and seeds in my dreams—Simply seed madness! But after all, we love it." The true gardener's spirit.

SOME AMERICAN VIOLETS WANTED—Here is an opportunity to be of assistance to a member who has undertaken a difficult task. If you live where you can collect any of the *Viola* species listed below, please do so and mail to Doretta Klaber, R.D. 1, Quakertown, Pa. 18951. As you know she is working on a book about American violets, in which each American species will be represented by the author's drawing in full color, showing both flower and seed stages, root systems, and manner of growth. All drawings will be made from living plants, and the following plants are needed to complete her collection:

VV. affinia, arvensis (annual), *beckwithii, biflora, brittoniana, chrysantha, esculenta, egglesonii, flettii, floridana, incognita, lanceolata vittata, langloisii, lovelliana, missouriensis, novae-angliae, nuttallii, ocellata, pallens, palustris, pedunculata, rugulosa* (from midwest), *rafinesquii* (annual), *scopulorum, septemloba, septentrionalis, triloba dilitata, tripartita, viarum, villosa*.

"The plants arrive in good condition when sent *soilless*, in closed polyethylene bags in cardboard boxes and sent Airmail. (I'll be happy to pay postage, or any other charges)." Thus writes Mrs. Klaber, and she adds, "Some on this list have been promised me (if possible) but it will not matter if I get duplicates. Specimens from different parts of the country frequently vary enough to warrant showing both forms." Help if you can!

OMNIUM-GATHERUM

The current Seed List of the ARGS is exciting and it gives evidence of a growing interest in the Society's seed distributing activities. The new director, Mr. Lawrence P. Crocker of Medford, Oregon, has been swamped with donations of seeds from many parts of the world. He has, by his enthusiasm and a great deal of hard work, handled a job with which he was unfamiliar, in a highly praiseworthy manner. The new Seed List is impressive in the number and diversity of the seeds listed. It is well presented in an attractive and easily read booklet, with pertinent notes on some of the plants.

That there are a few errors evident in plant nomenclature, spelling, and alphabetizing is not surprising in view of the late arrival of many of the seed donations, the pressure of meeting the printing dead line, and the lack of time for adequate proofreading. That errors are so few and so unnoticeable is a fine tribute to the new director.

A glance at numbers alone may give you an idea of the demands made on Mr. Crocker for hundreds of hours of high-speed work under mounting pressure at a time when yet unfamiliar with the responsibilities in the many ramifications of this exacting work. Following is a brief but revealing tabulation:

YEAR	DONORS	PLANT LISTINGS	NO. OF GENERA	AVE. SPECIES PER GENERA
1965	84	1265	353	3.7
1966	116	1451	362	4.0
1967	154	1964	401	4.8

Many other interesting matters come to light by a careful study of the donors and the plants listed. The geographical distribution of the donors is one, with Washington leading with 25, followed by New York with 17, etc.; the several genera with the most listings is another, with *Primulas* leading, followed by *Campanulas*, *Saxifrages*, *Dianthus*, *Penstemons* and *Anemones* in that order; the number of rare species represented (too many to list here); and the quantity, both in bulk and in number of species, donated by nine of our fourteen members from Czechoslovakia; all these and many more could be enumerated.

This list is the culmination of a vast amount of work on the part of the donors, the director and his helpers. But with the distribution of the Seed List, the total operation for 1967 is far from complete. Yet by the time you read this, the remaining operations will have been accomplished. You will have selected the seeds you want. Lawrence will have sent them to you to the best of his ability in accordance with the seed supply of the species of your selection (an exacting and many times frustrating task), and you will have planted your seeds. This is the time of anticipation; you must wait to see in what measure the results of your plantings bring you pleasure or disappointment—the former, it is fervently hoped! Regardless, the members of the Society are grateful to the many donors. To the new director, they are saying, "Well done and thank you. We will try to make next year even better, and we know that your task will be much easier for having had this one year's experience."

In a letter to the editor, Lawrence Crocker said, "There have been many problems in the Seed Exchange that at times have discouraged me, but on the whole I have enjoyed it. It has given me something to do at a dull period, and I have made contacts with many fine people."

* * * * *

It has been called to the editor's attention, by a Californian, of course, that one never speaks or writes of the Sierra Nevadas, for either word is plural in its own right. Therefore the "s" is not necessary. So the title of Pauline Croxton's article, appearing in the January, 1967 *Bulletin* should be changed to "Field Trip in the Sierra Nevada."

* * * * *

In reading the review of *The Oxford Book of Flowerless Plants*, which appears in this issue of the *Bulletin*, several thoughts come to mind. One is that perhaps many of us fence ourselves in by too close an application to those things in which our interests are concentrated. Occasionally we allow ourselves to look beyond the confines of our primary interests; to look at the world on the other side of the fence. What we see there often intrigues us, and were it not for the restraining effects of habit and a too strict budgeting of our time, we might have found a new interest.

One may be faithful to entrenched interests and yet stray a bit into other fields. Such straying may be the means of adding to the interests already

established. It seems illogical, when there are so many things in the world of nature that are compatible with our compulsion to be rock gardeners, that we should confine ourselves to so very few of them and close our eyes and our minds to the rest. Why not let our questing minds roam? In so doing our desire to be better rock gardeners, and our capabilities for being such will be greater because we have extended our interests into distant fields, have added to our knowledge, broadened the base of our activities, refreshed our spirits with the establishment of wider horizons; more than all these, we may find that we have more to offer and more to share with others.

It may be true that some of us feel that our lives are full enough, that the pursuits of our chosen interests are more than sufficient to keep us occupied and happy. Perhaps there is a vague feeling of guilt when we feel an urge to enlarge the scope of our interests; a feeling that we are not being fair to those interests with which we are already occupied. We should examine this very closely, and if we do so objectively, it is possible that we will come to the conclusion that we have been, and still are limiting ourselves needlessly. True it is that many of us, for reasons of health, advanced age, responsibilities, etc., may be unable to roam very far physically, but none of these restricting conditions can keep the mind from exploring at will.

Actually, there is no known limit to our ability to lead a fuller and a richer life. Limitations that seem to exist are mostly of our own making, and if we are capable of limiting ourselves, we are also capable of demolishing whatever it is that is restraining us. We can unshackle our minds and send our thoughts, if we like, to the furthestmost star, or to the lichens that paint in brilliant color the faces of our mountain rocks, or to that which would hitherto have escaped our notice—the newly-sprung mushroom at our feet. We can set ourselves free!

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