

BULLETIN

of the

AMERICAN ROCK GARDEN SOCIETY

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JANUARY, 1954

No. 1

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PETER JACOBUS van MELLE

The family and friends of Peter Jacobus van Melle were deeply shocked when he passed away on December 8, after being stricken with a heart seizure five days before. Up until that time he had been actively engaged in his business work as usual. He had just completed a revision of his notable book on Shrubs and Trees for the Small Place, and was looking forward with enthusiasm to writing one on Evergreens.

Born in Holland in June 1891, Mr. van Melle came to America in 1911. He became associated with the nursery firm of Bobbink & Atkins at Rutherford, N. J., and travelled extensively in his capacity of landscape designer and salesman. After five years he transferred to the neighboring firm of Julius Roehrs Co. as manager of their landscape department. In 1920 he moved to Poughkeepsie, N. Y., and became associated with William J. Godding and the Poughkeepsie Nursery Co., of which he was secretary-treasurer from then until his death.

While his chief business interest was in landscape design and planting he developed an ever expanding interest in plants in general. One of his happiest associations was with the American Rock Garden Society. He became actively engaged in its work from the beginning and was a Director for some time. In Poughkeepsie he became a close friend of the late Clarence Lown of rock plant fame. By the late 1920s "Van" had gathered from various sources a fine collection of rock garden plants at his home and nursery. He was a prolific writer and lecturer on the subject and expressed his views with authority. In 1930 he wrote several articles on Rock Garden Plants for the National Nurseryman, and in 1936 wrote a fine series of articles for the Florists Exchange, under the title "Seeking Out the Best."

His passion for research was great, and he had endless patience in checking and re-checking on sources of information concerning the plants he was interested in. He was never so happy as when engaged in a continuing discussion about some phase or other relating to plants; their history and culture.

He has left a fine record on the pages of American Horticulture, and pleasant memories with his many friends.

HENRY E. DOWNER



P. J. VAN MELLE

PLANTS THAT RETAIN THEIR FASCINATION

HAROLD EPSTEIN, LARCHMONT, N. Y.

THE ENDING OF THE CALENDAR YEAR suggests a review and an inventory of plants acquired during the past. This one-acre garden seems to have an endless procession of plants moving through it. New acquisitions often push older and less favored plants either to the background or to the compost heap. Even our postman expresses concern as to the possibility of our accommodating additional material, but as explained to him, plants, like humans, do not live forever, often lose favor while still alive, and are then disposed of in one way or another.

An insatiable curiosity about plants can be satisfied only by trying each one in turn. Experiments with hundreds of them lead to the one definite conclusion that the average garden cannot do justice to all types, because differing plant groups require widely various locations and aspects.

Time and experiment have proved that ours is basically a *woodland* garden, and that its high oaks are favorable to plants appreciating varying degrees of shade. Trial and error show that these conditions do not suit plants of the Mediterranean area, or those from other open, baked exposures, for the maximum sun available here in the most exposed spots amounts to hardly more than three or four hours daily, and that only in midsummer.

Consequently the plants that have made the best record here belong to the woodland. Except for their shade preference, the ones that like our garden and are liked in it, belong to no single class, but include conifers, evergreen and deciduous shrubs, herbaceous plants and bulbs. For the many gardeners with similar conditions, who often complain of a dearth of plant material adaptable to their sites, let me call attention to a few of each kind, especially those not too well known.

An American conifer that has enriched our garden flora with many desirable selected forms is the eastern hemlock spruce, *Tsuga canadensis*, whose dwarfed, more compact forms have, particularly during the past score of years, come to be appreciated by a limited few. As a result many seedlings from the wild and some from nursery rows have been selected and named, but unfortunately too little propagated for commercial introduction.

However, one of these has crept into the diminishing American plant trade, and may occasionally be seen in nurseries which carry the better and more unusual stock. Generally accepted names for this hemlock are *T. c. minima* or *nana*, and it may be described as a diminutive form of the Sargent hemlock, *T. c. pendula*. A spreading plant, nearly twice as broad as high, it puts out almost horizontal branches with a graceful fan-like arrangement of branchlets, the dark green foliage of delicate texture. The rate of growth is fairly slow, averaging not more than three or four inches in width a year. The oldest plant of this variant in our garden is now 36 x 42 inches in width and 16 inches high, situated near the edge of a rather shallow rock ledge and several feet from a huge oak, a very dry spot which may have slowed its growth. For when planted twelve years ago it was about 12 to 15 inches in diameter.

It has been suggested that the clone be known as *T. c.* 'Bennett' to differentiate it from a few other similar variants discovered later that do not equal this conifer in beauty and grace. The story of its origin is always of interest and warrants repeating. The plant is said to have been found by a Mr. Bennett, a



Rhododendron Williamstanum at its best in the south of England, Caerhays, Cornwall.

New Jersey nurseryman, among a group of "Chinese" hemlocks which he had imported from Japan in 1920. However it is plainly a variant of Canadian hemlock.

Unlike the typical species, 'Bennett' is easily rooted from cuttings, which are preferred to the alternative method of propagation by grafting. It is an easy and hardy conifer, ideally suited for use in the small or large garden, for foundation plantings, rock gardens, or as a specimen. Not so slow a grower as some of the exceedingly dwarf forms of hemlock, this is a shrub for the practical nurseryman who may have become discouraged by the slow monetary return from some other dwarf conifers. It is a first class evergreen which has been neglected by the general nursery trade, and unquestionably deserves more and wider recognition.

Another American conifer too little known but exceptionally appealing, and adaptable to the rock garden, is *Pinus aristata*, which hails from our Southwest (California to Colorado and Arizona) but is dependably hardy into the New England area. In its native haunts, where it sometimes becomes a small tree, it is known either as the bristlecone or hickory pine. The form cultivated here is a very slow grower and quite dwarf, a handsome low conifer with a picturesque and irregular habit, ideal to place in rock pockets where space is limited. A young plant grown from seed by a generous friend, although now about seven years old, is but seven inches high and as wide. It doubtless cannot outgrow its present corner for many years. While this pine and all others prefer a completely open site, our plant receives only partial exposure to the sun (the maximum obtainable here), but has open sky overhead, an important detail. I know only one other planting of the species in this region, at the Thompson Memorial Rock Garden in the Bronx Botanical Garden. There a group which I have observed for many years stands close to the path at the northeast end. Growth has been barely perceptible.

Pinus aristata is one of the five-needle pines, but quite distinct because of the rosette arrangement of the leaf sheaf. Another favorable detail is its long-retained, 1½-inch needles which will persist for twelve to fifteen years. Inasmuch as there are so few really dwarf pines for the rock garden, it is doubly important that this species begin to receive some recognition in cultivation.

One broad-leaved evergreen I mention with some hesitation. Among the increasing number of Rhododendrons in the garden, the species that has prospered most surprisingly during the past dozen years is *R. Williamsianum*. Some years ago, after reading about the species and admiring illustrations of it, I had been tempted into obtaining a plant, although the hardiness rating of C did indicate some tenderness here. Inquiry among Rhododendron enthusiasts in the vicinity did not add much encouragement. Nevertheless a well budded plant about a foot in diameter was obtained one spring from the Pacific Northwest. It was placed on a slope facing northwest, well protected by the house and shrubbery. In this spot it has persisted through the past twelve years, spreading out until now almost four feet in diameter, and fifteen inches high.

Bloom has been very scant, probably because the exposure permitted only a limited amount of afternoon sunshine. However, this past summer, which induced budding on many stubborn subjects, brought a promising crop to this plant of *R. Williamsianum*. Inasmuch as it was crowding its allotted space, a decision was made to risk moving it to a more open area where it will receive more sunlight. This was done during one of the late summer hot spells, and without any indicated resentment by the plant.

During the past several years, additional plants of this Rhododendron have been carefully placed in various spots in the garden, but always favoring slopes



Clematis (Atragene) alpina var. sibirica

exposed to the north and west. This exposure appears to be extremely helpful in cultivating many borderline or questionably hardy plants, avoiding the dangers of morning sun during winter and early spring. This autumn closes with many of these smaller plants well budded for the first time, and naturally encourages the culture of a *Rhododendron* which has a well established reputation as a shy and undependable bloomer both in the States and in England.

Extra care in the spring is essential, particularly where there are late frosts, for the early beautiful metallic foliage is particularly susceptible to frost damage. To gain the advantage of growing plants which may be beyond one's expected climatic conditions, it is necessary to study the micro-zones of hardiness which may vary surprisingly in each individual garden. It must be admitted that plants questionably winter-hardy should receive some extra attention and protection. The plan here consists of using conifer branches as a light covering for these small shrubs, not a laborious task, and accomplished immediately after Christmas, when there is usually a surplus of unsold Christmas greens. This protective device has been used for years, and is unquestionably one of the best materials for mulching.

Even if *R. Williamsianum* were not to bloom, its very interesting and decorative foliage and habit provide sufficient compensation for the space it occupies. This *Rhododendron* is native of Szechuan Province in China, at about 8,000 to 10,000 feet elevation. It is usually a spreading shrub of neat habit with small heart-shaped leaves, its nodding, pale pink flowers, almost two inches in diameter, disproportionately large as compared with the foliage and the plant. Certainly one of the most attractive *Rhododendron* species, it has many possible uses in the garden, and deserves more exploitation to determine its extremes of hardiness in the eastern area. It is easily propagated from seeds or cuttings.

A small deciduous shrub that warrants being publicized is *Indigofera incarnata (decora) alba*. This beautiful but unpretentious plant bears sprays of white pea-like flowers in July and August. Seldom growing above 18 inches in height, it usually kills back to the ground in winter, but new growth is produced rapidly in spring, to provide profuse bloom on the new wood. The fact that individual plants increase by means of underground stems, suggests its possible use as a dense ground cover for large areas. This white variety is supposedly much hardier than the normal pink type of the species, which appears not to be in cultivation, for many inquiries over the past years have not led to any source for it. The albino form is an easy subject, readily propagated by seed, by cuttings, or by detaching suckers or underground stems.

Effective combination of plants in the garden often comes about by chance. A few years ago a seedling of *Clematis alpina* was placed in a deep pocket where stones slope down before a background planting of *Tsuga caroliniana* and various *Rhododendrons*. The object was to let the *Clematis* trail down the rocks as it had been observed ramping at the edge of woodlands over just such outcrops in the Dolomites of northern Italy. Instead it kept climbing, not forward, but back amid the shrubs behind it as though for their protection and association, refusing to come into the open and drape the rocks as planned.

The unexpected result was a striking combination with *Rhododendron* 'Bow Bells', a *Williamsianum* hybrid. The *Clematis* with its satiny blue flowers had wandered through this group of *Rhododendrons* which were covered at the same time with their own delicate pink blossoms. The contrast of blue and pink against the dark green background gave an effect we shall look forward to in future years. It does not seem likely that this *Clematis* can overwhelm the shrubs among which it is trailing, for it is reputed to reach only six to eight feet. Any

excess growth can easily be pruned away. There must be many uses for this early-blooming Clematis, and other positions are planned for it, first the edge of a high outcrop where its branches will be forced to tumble gracefully as they had been seen to do in the wild.

It is easily propagated from seed, which may often be noted in seed lists. My seeds sown in a cold frame in October had germinated by February, and by autumn the plants should be large enough to go out in the garden. With such seedlings, it is usually recommended that they be placed amid protecting shrubbery, so that the base is not completely exposed to the full sun. When partly shaded, or even in the open with a northern exposure, *Clematis alpina* does well, and in addition to its spring bloom may often display a sprinkling of flowers during the fall. Unusually good color forms can easily be propagated by cuttings. This Clematis is not one of the very robust climbers that are common in its family, and it can be adapted to the small garden without difficulty.

Memories of *Clematis alpina* ramping at the edges of woodlands recall also *Anemone trifolia*, a plant associated with it in large masses around Lake Misurina in the Dolomites. Closely related to *A. nemorosa*, it may be distinguished as a larger, more vigorous and grandiose form. The similarity starts from the root, which is also whitish and horizontal, but much stronger. The foliage has a texture similar to that of *A. nemorosa*, but less variable and broader, also longer lasting, appearing almost evergreen, for it persists into late summer in this garden. The flowers are pure white, held erect over the foliage, and are most effective in large masses. A search for the reputed light blue form supposed to be native around Lake Misurina was unsuccessful. Even some roots originally collected there and imported here from England, proved to be the white form, without any evidence of blue in the flower.

Anemone trifolia is now well established here as a ground cover in a shady corner amid hybrid Rhododendrons. The few original bits of root have prospered, and now give a thick rich carpet covering several square feet of woodland soil. Growth seems to be much more rapid than with the more familiar *A. nemorosa*, while increase by the division of its woody roots is certainly easy. This Anemone is particularly desirable for those who appreciate the woodland ground covers. Unfortunately the plant is not readily available here, but roots can be obtained from England, where they are stocked by several of the leading nurseries.

A family of more substantial ground covers are the Ajugas. Of these the most invasive is the species *A. reptans* with its various color forms. It can cover large areas in a very short time, but when permitted to become congested, is often subject to a fungous disease which can eradicate it completely. Another species, *A. genevensis*, less common but also with a few color forms, does not produce runners, and thus while not covering rapidly as much ground as *A. reptans*, is the better and more permanent plant.

Even superior to this is *Ajuga pyramidalis*, a native of central and eastern Europe, unfortunately too little known. When set in rich damp soil, it will form substantial clumps, and later in the season will often produce short stolons rather dissimilar in habit to those of *A. reptans*. The most distinguishing feature is the 9 to 12-inch flower spike, the best in the family, compact and pyramidal, unlike the other Ajugas, and with flowers often of a deep gentian-blue color. Here this plant is combined with some of the smaller hybrid Narcissi, both planted under a multi-stemmed pink *Cornus florida*, where the Ajuga and dogwood in bloom together produce another fine combination of deep blue and pink. Though a selective gardener might consider *Ajuga pyramidalis* rather coarse, it still has a place in the woodland garden under the larger trees and shrubs.

Near this *Ajuga* but in the foreground is a planting of *Phlox ovata pulchra*, in an area more open to the sun, with a northwestern exposure. Propagated by cuttings from a few older plants that have persisted for several years in another partially shaded area, they prove by trial and error that some shade and moisture are advisable, for in dry soil the plants are short-lived. It is surprising to know how seldom this desirable plant, discovered in Walker County, Alabama, and introduced by Dr. Wherry, is now listed by nurseries. It does not appear to be difficult, and is another of our natives that should be better known.

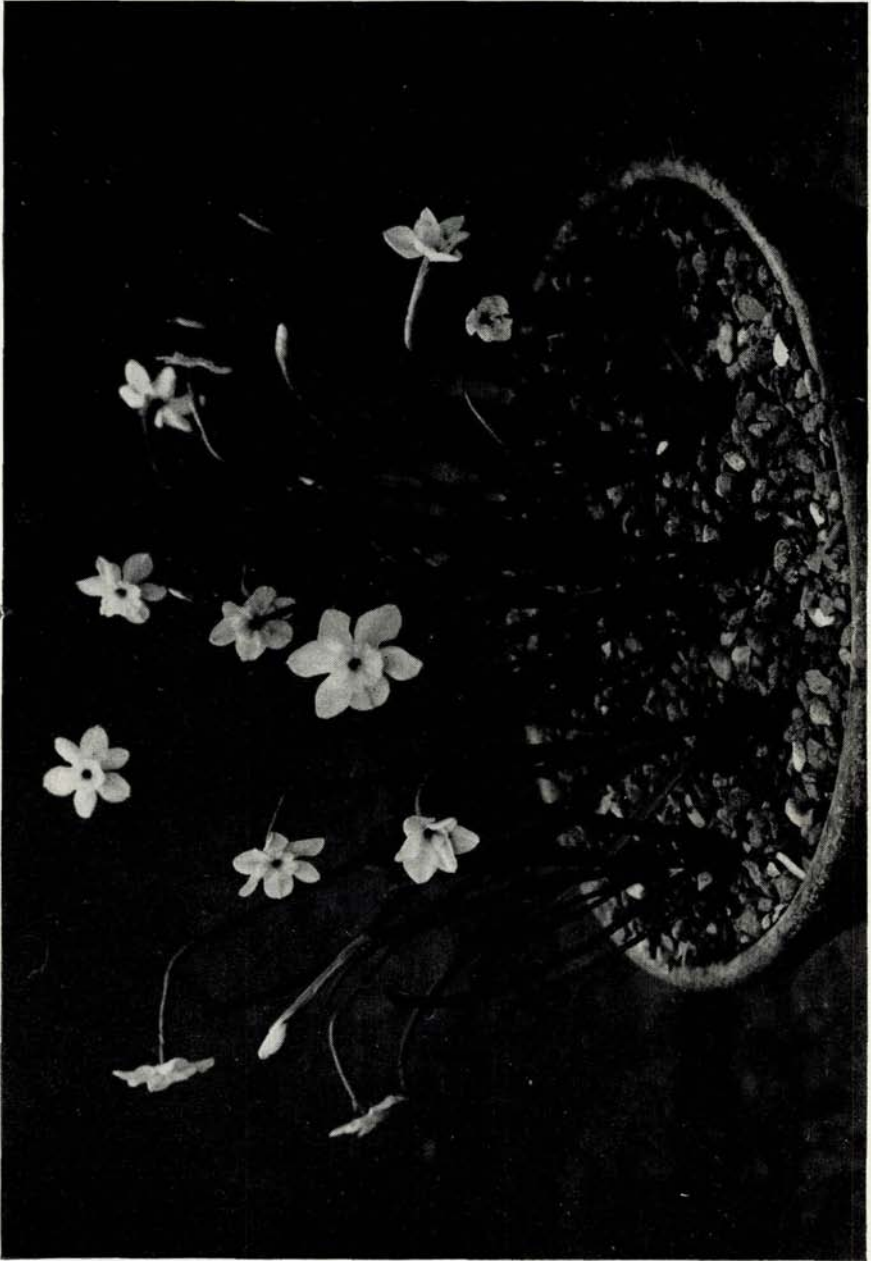
A search of previous issues of the Bulletin reveals that too little has been written about the virtues of *Phlox ovata pulchra*. While the type species, *P. ovata*, usually has unattractive magenta flowers to weaken its popularity, this form *pulchra* opens larger blossoms of a beautiful soft pink. In this garden the plant grows to only 12 inches, and there is a tendency for the stems to root at the nodes where resting on the soil. It is therefore easy to propagate by separating these rooted layers, but like many other Phloxes can also be increased by cuttings of either stems or roots.

There appear to be two different forms of *Phlox ovata pulchra* in cultivation, both with blossoms of similar size and color, but differing in the leaf. The plants described above have leaves smaller than typical *P. ovata*, and not as ovate. They originated from stock disseminated by the late G. Latta Clement, who was instrumental in spreading so many of the better plants from our southeastern states. The second form, distributed by a well-known eastern nursery, has more typical *P. ovata* foliage.

I cannot close these notes without considering at least one of the hardy bulbs. Of the many bulbous species and hybrids which have found their way into this garden, one that has earned a most prominent position is the species *Narcissus Watieri*, a plant very rare in the wild, being endemic to the Grand Atlas of Morocco in northern Africa. Only in recent years has the supply of its bulbs become sufficient to make the plant really popular. Frankly, I am not familiar with other plantings of it hereabouts, and of course can speak only of its behavior here. Several bulbs were set outdoors in a well drained spot in front of some dwarf Azaleas, where they have persisted, blooming regularly each spring. Part of the original lot were planted in a clay pan, and stored in a covered cold frame during the winter. These also have prospered and have since been planted outdoors to join the first group. They have all proved free bloomers, and regularly produce a plentiful supply of seed, which in turn has been used to multiply this intriguing dwarf.

One of the small Jonquil group of *Narcissus*, *N. Watieri*, in company with several other species, belongs to a most fascinating association of dwarf bulbs. It has relatively large ivory-white flowers an inch or a little less in diameter, held about four inches high above spreading foliage of a grayish green color. It has proved amenable to outdoor cultivation here, although native to a region with rather divergent climatic conditions. The most important detail to be remembered in growing it is the necessity for perfect drainage, whether outdoors or in a pan.

All the plants mentioned above have two qualities in common, persistence in the garden and ease of cultivation. Not all of them, unfortunately, are too well known, and some are perhaps not too easy to obtain, but once procured should repay with many years of continued pleasure.



Narcissus Watieri, one of the best and dwarfest of the jonquils.

PRIMROSES OF CENTRAL EUROPE

ING. HUBERT MARTIN, FROHNLEITEN, AUSTRIA

PRIMROSES OF THE PLAINS AND FOOTHILLS

AMONG THE ROCK PRIMROSES of the Alps, only one single species, *Primula Auricula*, has yellow flowers, but with the primroses of the alpine woods and meadows, it is quite the opposite. Of these there are two species exhibiting the lovely pink hue of *P. Clusiana* and other magnificent rock primroses, while the rest bloom yellow.

Primula vulgaris (*P. acaulis*), the stemless cowslip, is in our region the best known, and where it is found, by far the most abundant species. The flowers, borne singly on stalks 2 to 4½ inches high, are of good size and a luminous yellow color. Depending on the weather, this primrose may bloom in early February, but can be counted on in March, when the blossoms appear in such profusion that each yellow disk is crowded against the next. Its range is of the widest, the greater part of Europe, especially the entire region of the Alps, but also France, Spain and even north Africa, then too the Carpathians and on into Asia Minor. In Africa it is almost the only primrose. An absolutely sure bloomer, and also undemanding and modest, it grows for the most part in the grass, together with snowdrops, Anemones and Hepaticas, and with these simple flowers, one can make a most beautiful spring meadow.

There are numerous varieties of *P. vulgaris*. Very pretty and much prized in cultivation are the doubles aptly named for their colors, as the white *alba plena*, the red *rubra plena*, lilac *lilacina plena*, and yellow *lutea plena*. Breeders have tried to produce red, and above all, blue shades, and some among us as well as a few in Germany have obtained astonishing results. To be sure, neither blue nor red primroses have thus far reproduced dependably true from seeds, and like the double varieties, must be propagated by division. Seedlings bloom in all shades, and plants of this sort with their varying tints make a display beautiful to behold. Introduction of the blood of *P. Julianae* has contributed much to these breeding successes.

Among the tall cowslips, *Primula elatior* is most abundant, inhabiting by choice moist meadows, where the charming flower heads are borne on stems as much as a foot high. The individual flowers strongly resemble those of *P. vulgaris*, and like this species, it is easy to cultivate and a most profuse bloomer. Strong flowering plants of all these primroses may be obtained the second year from seed. From *P. elatior* also spring a multitude of varieties and forms, but I cannot go into them here.

Natural variations include the following subspecies: *intricata* from southern Europe, in all parts smaller and more densely hairy, *genuina* with gray-green undersides to the leaves, *carpatica* which, with *leucophylla*, occurs in the Carpathian Mountains. All these are separated by minor differences, of chiefly botanical interest.

Primula veris (formerly *P. officinalis*) has inconspicuous flowers of small size, only the red forms being worthy of cultivation. This species formerly played a rather important role in medicine, and does even today, used principally to make cough mixtures. Of particular interest among these cowslips were the double forms. I used to cultivate several kinds, now victims of the war, or rather of the post-war period. Despite all my efforts, I have been unable to obtain them again. The principal subspecies are *canescens*, *Columnae*, *macrocalyx* and *Velanovskyi*. They are recognized forms of botanical interest, but they rarely repro-

duce themselves true from seed. There are still other varieties which I cannot go into here.

Now let us turn our attention to the rosy flowering species, first the little mealy, or better, flour-dusted primrose, *P. farinosa*. This is definitely a moisture-loving plant, carrying reddish pink to lilac blossoms on stems up to eight inches long. It is found all over Europe, as well as on the coasts of China and Japan, and moreover is the only species of *Primula* in the Andes of South America. (By some the Andean form is considered a separate species, *P. magellanica*. Ed.)

It inhabits by preference meadows flowing with spring water, brook banks, and moist glades of the foothills. Since only with difficulty can we offer it similar conditions in the garden, this species is unfortunately not exactly easy under cultivation, yet it can be grown from seed without much trouble. I have grown it, for example, with good results, in boggy ground along with *P. rosea*, *Calla palustris*, *Orchis maculata*, *Pinguicula*, and for a ground cover *Hypsela longiflora*, in which conditions the *Primulas* have self-sown. Of *P. farinosa* also there are several varieties, some pure white, and one in particular called var. *acaulis* (var. *pygmaea*) with the flowers very short stalked, a northern variety.

Our other rosy blooming *Primula*, *P. longiflora* (*P. Halleri*), the long-flowered primrose, grows under very different conditions. Its most striking characteristic is the inch-long calyx tube which adds to the beauty of the lovely blossoms. Although it has been confused with *P. farinosa*, it lacks the powder with which that species is so richly dusted.

We find it in our Alps on limestone, and it occurs also in Tessin, in the Balkans, and has been reported from the Caucasus. It should be regarded as an alpine plant, growing often as high as 6,000 feet. This beautiful primrose, which is most effective when planted in considerable numbers close together, is not exactly distinguished for vigor in the garden. It will do best in half shade, in a heavy garden soil generously lightened with peat. Planted in this fashion, it will persist for years, and is easily multiplied by seed, which it produces in abundance.

ROCK PRIMROSES OF THE ALPS

The primroses must be included unquestionably with the loveliest floral children of the mountain ranges. Foremost among them is the fragrant, beautiful *Primula Auricula*, as proclaimed by all the names the folk tongue has bestowed upon this plant, Petergstamm, Solenatsch, Platinegel, gelber Speik. With its huge flower heads, often 30 or more florets on a single stalk, it belongs with the most beloved of the mountain flowers. The auricula, the gentian, the alpine rose and the vanilla orchid—these are surely the four flowers best known and most sought after, and must all be protected by law to shield them from the too great affection of the public.

Primula Auricula is native to the entire region of the Alps, and has numerous stations and lowland forms, as for example, *P. ciliata* in the Apennines and *P. serratifolia* in the Balkans. What has been called var. *albocincta*, characterized by a sharp-edged, well defined, mealy border, grows mainly in the Tyrol. Var. *monacensis*, a sparsely mealy lowland type, was formerly plentiful in Dachauer Moor, but has almost entirely disappeared from this region since the land was brought under cultivation. *P. Balbisii*, likewise a lowland form, plentiful in the foothills of the Mariazeller region, has no fragrance. The widespread lowland var. *Obristii* should also be mentioned, occurring in the northern approaches to the Alps and in the hills of Hungary. Only the bracts are mealy, the leaves being bare and distinctly glandular.

Of particular interest is the strong propensity of the auricula to hybridize. It crosses naturally with *P. carniolica*, *hirsuta* (*rubra*), *integrifolia*, *daonensis* (*oenensis*) and *Clusiana*. This last cross I found on the Rax and named *P. Lempergii*. Our garden auriculas are surely hybrids, principally the cross *P. Auricula* \times *hirsuta*. This natural hybrid is seen frequently in the Alps, and was described as *P. pubescens*. The flowers vary. I have found whites, pure yellows, pinkish lilac, and many intermediate shades. It usually occurs in places where the rock strata have shifted, commonly in the Tyrol, so that limestone and granitic rocks overlap, and so offer a living place for both parents, the lime-loving auricula and the silica-loving *P. hirsuta*. This hybrid and that between *P. Auricula* and *P. carniolica*, described as *P. venusta*, are certainly the origin of our modern garden auriculas.

Although *P. Auricula* is the only yellow rock primrose of the Alps, there are red and blue primroses in considerable numbers. Scattered throughout the entire region of the Alps is *P. minima*, smallest of the primroses. The plants tend to grow in clumps, making dense mats of small rosettes. The tips of the leaves are equipped with three to nine thorny, pointed saw-teeth, the vivid pink blossoms borne for the most part singly.

Whereas *P. Auricula* belongs with the easily grown species, *P. minima* is almost incapable of cultivation, and above all tardy about blooming. However there are many natural hybrids much more accommodating, as for instance *P. intermedia* (*minima* \times *Clusiana*), with the leaves of *Clusiana* but reduced in size, and the saw-tooth pattern of *minima*. It is found as a rarity in several places in the Schneeberg, and may be cultivated as easily as *Clusiana*.

Another such natural hybrid is the cross *P. villosa* \times *minima*, not too rare in the region of the Turracherhoehe. I once came upon this pretty form on a large, isolated block of stone whose cracks and fissures were completely filled with it. The well established cross *P. glutinosa* \times *minima* I personally have never found, but in the Kaerntner Mountains I did see *P. Wulfeniana* \times *minima*.

The hybrid *P. tirolensis* \times *minima*, which has become known as Juribella, is not particularly rare, but usually overlooked because of its small size. Larger, more pleasing examples of hybridity are *P. integrifolia* \times *minima* and *spectabile* \times *minima*. Kolb, the pioneer of alpine gardening in Austria, lists a profusion of such hybrids by name in his book, now unfortunately out of print, but because of their often exceedingly variable habit, it is better to discard these names, and designate them simply as hybrids in the form shown above.

Abundant everywhere in the eastern Alps, especially on limestone, is the *Clusius* primrose, named for Empress Maria Theresa's famous botanist and personal physician. It inhabits prevailing grassy spots, and its beautiful red blossoms, which appear immediately after the melting of the snow, are of great decorative value. It is very plentiful growing mixed with *P. Auricula*, and the brilliance of the color contrast between red and yellow, together with the little blue bells of *Soldanella*, create an enchanting effect. *P. Clusiana* likes a cool location and does well in the rock garden when well shaded and planted in heavy soil made porous by the addition of peat and sand.

The counterpart of *P. Clusiana* in the southern Alps is *P. Wulfeniana*, and in the western Alps, *P. integrifolia*. Both forms are distinguished from *P. Clusiana* by the shape of their leaves, but resemble it in their blossoms and in their cultural requirements.

Confined to the eastern Alps, the outstanding primrose of Styria, *P. villosa*, is limited in its range in the Turracherhoehe to isolated mountains, often to eastward-facing cliffs near the summit. It blooms red, and the unpowdered leaves are densely hairy, whence the common name, ragged primrose. As might be

expected from its restricted habitat, confined to shaly rocks or pure granite, it ranks among the more delicate species, yet with a little care can be kept in cultivation for years.

P. commutata has an even more restricted range. It resembles the preceding species, distinguished only by relatively thinner leaves, rough on the upper surface, and for the most part unevenly toothed. Like all our red primroses it is protected by law, and since the only known stand is on just one single mountain in our green Styria, by good fortune in a private hunting preserve and closed to the public, it may well survive for us.

For a blue primrose, we have *P. glutinosa*, native in the eastern Alps and eastern sections of the western Alps. It likes still cooler situations, climbing to 9,000 feet and rarely found below 6,000 feet. It chooses northern slopes, and must be accounted one of the most difficult of the rock primroses. The blossoms are bright to dark blue, the leaves sticky, glabrous, and only at the tips irregularly and indefinitely toothed.

With this we complete our discussion of the primroses of the eastern Alps, and come now to the southern Alps. The typical representative in the Julian Alps is *P. carniolica*, the Krainer primrose. It often forms robust tufts with several crowns, the large leaves definitely stalked and with slightly undulating margins. The pink to lilac blossoms are often borne on long stems. This plant occurs in the woodland zone, in damp ravines and other shaded places, and offers no particular difficulties in garden culture.

In the central southern Alps, *P. tirolensis* predominates, a small, very pretty rock primrose of the southern Tyrol, with flowers lilac red. Like the closely related *P. minima*, it is strictly a collector's plant, and both are very difficult to establish. A variant is *P. Allionii*, which grows in the Maritime Alps, together with the magnificent *P. marginata*. This pretty, lilac-red-flowering primrose is characterized by the heavy yellow meal which covers the leaves and their bases. It blooms readily, is of easy culture, and I have even propagated this species without difficulty by crown cuttings. (The stems root easily.)

Conspicuously toothed margins distinguish *P. crenata*. Likewise from the southern Alps are the blue-green *P. glaucescens* and the splendid *P. spectabilis*. The former has smooth leaves and rosy to violet blossoms standing two or three together on stems up to five inches high. The latter easily surpasses *P. glaucescens* in beauty. In particular it has flower heads of generous size and a pleasing pink color. Both inhabit moist limestone, and grow in the garden without too much trouble.

To complete the account I might also mention *P. oenensis* from southern Tyrol, south Switzerland and northern Italy, although, not liking limestone, it may be counted among the most difficult species. The sparsely flowering stalks bear three to six blossoms of a pink lilac hue.

The principal species of the western Alps is *P. hirsuta*. Because of the rough hairs on its leaves, it is known as the hairy primrose, and flowers pink to lilac, but pure white forms have also been found. As previously stated in the description of the auricula, the hybrid between these two must certainly be considered the parent of the garden auriculas, and is also called *P. hortensis*. This has been proved by Prof. Wellstein's successful experiment, in which he was able to breed pure *P. hirsuta* from the hybrid. Doubtless other primroses were later interbred with the progeny of these two species, yet there are so many lovely colors among those natural hybrids which can be propagated from seed, that we might almost gladly dispense with some of the garden forms.

That *P. hirsuta* is a very variable species, the many local forms testify. There are some with small, almost stemless round leaves, and others with very different

elongated leaves. The dense hairiness, however, is common to all. Some were formerly established as named forms, f. *exscapa*, *serrulata*, *ciliata*, etc., but at the present time these names have been abandoned.

In the western Alps too is the entire-leaved primrose, *P. integrifolia*, which as the name indicates, has toothless leaves, mostly somewhat pointed. It has beautiful red flowers, and amateurs experienced in growing choice alpine plants will succeed with it under the same conditions as those recommended for *P. Clusiana*.

In conclusion, a few hints about the cultivation and propagation of the rock primroses. Primulas—and this holds true for by far the greater number of the many Asiatics as well—do best in heavy clay to which more or less "peat moss" should be added as required. Never should they be planted on southern slopes, nor do they relish a direct northern exposure, although in nature some species are found on northern slopes (*hirsuta*, *glutinosa*, etc.). Accordingly east or west, as far as possible, and no overhead shade, that is, do not plant directly under tree branches or beneath overhanging rocks. In the spring they want plenty of moisture, and should be watered freely. After flowering, they may be kept somewhat drier, and in August I water only during prolonged droughts. Observing their natural growing conditions, it is evident that they like the soil to be covered, so we plant them closely in order that their leaves may touch and so shade the ground.

Propagation: As already mentioned in the case of *P. marginata*, most primroses can be multiplied by crown cuttings, whereby the stems will root and produce several new crowns. I usually take the strongest stems from a clump, obtaining in this way new plants, while rejuvenating the parent. Propagation by seed is also satisfactory except for a few sterile hybrids. It is important to sow the seeds soon after they ripen, or at latest in the autumn. Seeds sown in spring will not germinate that year, but will remain dormant until exposed to frost and snow. After sowing, seeds should be kept dark and uniformly moist until germination takes place. Seedlings of rock primroses bloom usually the third year.

Rock gardeners who would like to learn more about Primulas than we can tell them with occasional articles in this Bulletin, should get in touch with the American Primrose Society, whose address and essential data are given on our inside back cover. The coming year finds them embarked upon the publication, in their Bulletin, of a Pictorial Dictionary of the Cultivated Species of Primula, surely a most laudable undertaking.

CORNUS RACEMOSA 'Slavin's Dwarf'

BERNARD HARKNESS, ROCHESTER, N. Y.

FROM SEED SOWN October 10, 1918 of the Grey Cornel, or Grey Dogwood, by Mr. Bernard H. Slavin, until 1942 Superintendent of Parks in Rochester, New York, there grew the usual typical plants except for one which appeared to be a dwarf variant. Subsequent growth bore out this observation. Perhaps it might have escaped notice in many places, but Mr. Slavin has had a life-long interest, he is now past eighty, in the variations that woody plants exhibit. The photograph of plants in a nursery row was taken in 1930.

As the photographs of the flowering branch indicate, its dwarfness is achieved by a shortening of the yearly length increments of the shoot, but numerous branches come out from the crown and there is spread by stolons. In good



garden soil its height would not be much over 30 inches, hence it seems that it would find suitable use in situations where the dwarf and sterile *Viburnum Opulus nanum* is now used. When encouraged by good cultivation 'Slavin's Dwarf' Grey Cornel produces flowers and fruits which differ slightly in color and size from the parent plant. In the shape of the panicle, however, this dwarf form produces a tighter, rounded cluster of flowers rather than the loose cyme of typical Grey Cornel.

Since this will be one of the first names to be published in the Bulletin under the new International Code of Nomenclature for Cultivated Plants a word of explanation may be in order. At the 13th International Horticultural Congress held in London in September 1952 the Code was adopted to become effective Jan. 1, 1954. Instead of the previously used botanical formae the minor variants arising in horticulture which can be referred to a recognized genus and species are now to be known as cultivars. When new cultivar names are to be published they will appear in common language and be written with single quotation marks. It remains to be seen whether proper recognition throughout the world will so quickly and easily be given to cultivar names in the vernacular and cited without benefit of authorship as was given to formae published under the International Code of Botanical Nomenclature.

MOSSES USEFUL IN PROPAGATION

G. G. NEARING, RAMSEY, N. J.

SPHAGNUM MOSS has lately received much publicity as a medium for the germination of seeds. It has long been known to contain antibiotics, as the substances are called which restrain growth of bacteria and fungi. Since the chief enemies of young seedlings are the damping-off fungi, such as *Pythium Debaryanum*,



Cornus racemosa 'Slavin's Dwarf', a miniature form of what used to be known as *Cornus paniculata*.

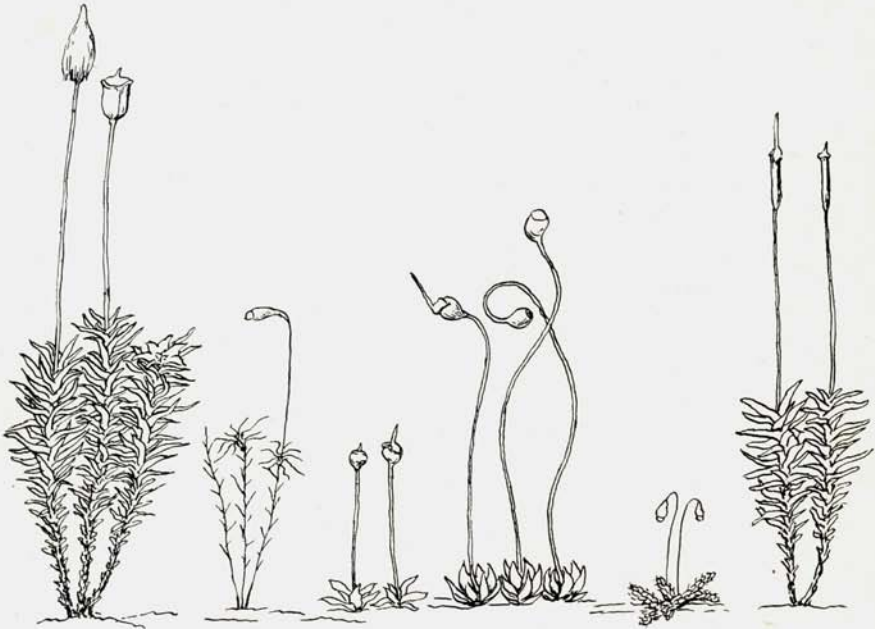
an antibiotic medium for germination would seem desirable. In my own experience, however, rubbed sphagnum proved unsatisfactory, not preventing the damping off, and failing to provide the seedlings with nutriment for vigorous growth. At the season when the small seedlings demanded transplanting, I had no time to handle them.

Other mosses though, living ones, have long helped me to grow seedlings of Rhododendrons and other ericaceous and shade plants, and with a minimum of attention. To understand the method, it is best to know something about the life history of a moss.

The seed of any moss is as small as a grain of flour, and is called a spore because it does not produce the plant directly, as a seed does, but by a round-about process, and is therefore not a true seed. When the moss spore germinates, it develops a mat of hair-like strands which spread over the surface of the ground, or over whatever the moss intends to grow on, looking like a thin greenish film. This film, called protonema, may cover an area of many square inches or even square feet before it puts up the shoots we recognize as moss. Some weeks usually elapse after the germination of the spore, before the protonema is ready to initiate the moss shoots, which soon spring up all over it to make the dense, cushion-like tufts characteristic of most species.

After the moss has matured, the protonema may disappear, or if it remains, is hidden from sight. There are exceptions. The moss *Pogonatum brevicaulis* which covers banks of raw dirt along shaded roadsides, keeps its protonema thick and bright green, seeming to function as leaves do in the production of plant food, while the mature moss shows only the tiniest of leaves, remaining hardly visible until the long-stalked spore capsules are thrust up.

There are hundreds of species of moss, differing in size, form, color, texture, in the substances they prefer to grow on, and in other respects. If living mosses are to grow with small seedling plants, as I contrive to make them do, they should not be large enough to crowd out or shade out the seedlings. The common hair-cap mosses *Polytrichum commune* and related species, often volunteer, but because they grow several inches tall, must be weeded out before reaching maturity, as they pull easily only while young. *Catharinea undulata*, rather similar though considerably smaller, must also be disposed of.



Polytrichum commune *Leptobryum pyriforme* *Physcomitrium turbinatum* *Funaria hygrometrica* *Bryum argenteum* *Catharinea undulata*

The ideal moss for this purpose is *Leptobryum pyriforme*, while *Dicranella rufescens* and *D. varia* may also be useful if not so readily established. These species seldom exceed an inch or so in height, and have extremely narrow, virtually hair-like leaves, casting little shadow. *Bryum argenteum*, even smaller and always volunteering, is less satisfactory because, creeping on the soil, it forms too dense a crust over the surface, and is less efficient at combatting harmful fungi.

Other species which frequently appear are the cord moss, *Funaria hygrometrica*, not particularly desirable because the spore capsules are too tall and numerous, and *Physcomitrium turbinatum*, more satisfactory, for though the leaves are broader, they are very short and close to the soil surface, while the capsules are carried on short stalks.

So far, no good method of establishing only one species of moss has been devised. The spores can be collected and dusted over the pots, but spores of other species are everywhere floating in the wind. The seed pots are placed in conditions which invite the favorable mosses, so those species usually predominate.

Rhododendron seeds are sown in 4-inch standard pots, prepared as follows: the bottom two-thirds or three-quarters carefully packed with broken soft brick, coarser below and finer above, so that the soil will not sift down between the

fragments; then a layer of compost, 3 parts Michigan sedge peat, 1 part sand, 1 part top soil, this layer filling the pot, then pressed down with the thumbs until there is space for a layer above it; finally another thin layer, 4 parts sand, 1 part Michigan peat, pressed down hard, and level with the edge of the pot. The filled pots are then placed in a pan of water to soak until by capillarity the top surface becomes wet.

Now the pot is ready for sowing and also prepared to invite favorable moss growth. After scattering the seeds very thinly, a slight sifting is added of just enough sand to anchor the seeds but not to cover them, but this is hardly necessary, as the seeds stick to the wet surface, which is never permitted to dry out. With the seed may be added a trace of the moss spores desired, though mosses will grow whether this is done or not.

Pots are now placed in pans containing about a quarter inch of water, in the same kind of frame used to propagate *Rhododendron* cuttings. This frame is described in New Jersey Agricultural Experiment Station Bulletin 666, now out of print after three printings, but still to be found in most large horticultural libraries. It is a tightly closed cold frame with a wooden bottom, and completely shaded from direct sunlight except the very early morning and very late afternoon rays, while inviting all possible light from the north sky or from white reflectors. No ventilation is ever necessary or desirable.

Needless to say, the soil must not be sterilized, for sterilization destroys completely the balance of life in which living organisms combat other organisms, and invites unopposed invasion by plant enemies which find in it nothing to prevent their indefinite multiplication. With unsterilized soil predictable results are obtained. The sowing is done in late March, and by mid-April a greenish film appears over the surface, the protonema of some moss or mosses, species as yet unknown. The protonema contains antibiotics, and from the time of its appearance the seeds are protected against the inroads of most fungi.

There is however a danger ahead. The moisture must be carefully regulated, with only a film of water in the pans, which the pots will suck up to produce just the right degree of dampness. If too wet, a whitish fungus will spread over and kill much of the protonema, and though this fungus does not usually injure the new seedlings beyond stunting their growth, the antibiotic protonema no longer protects them from inroads of damping-off fungi. If too dry, the protonema and eventually the seedlings themselves will be unable to grow. If the seed has been sown too thickly, too many seedlings will shade out the protonema.

Some damping off does often appear if the plants remain many months in the seed pots, but seldom where mosses have made a heavy growth, and scraping it away will usually stop its spread. If it progresses, and if plants killed by it are allowed to remain, the fungus fruits on them, bearing conidia which a puff of air may carry to other pots. As soon as the seedlings are large enough to move, any in infected pots should be handled first, so that these pots need not remain longer than necessary in the frame.

I find it much better to transplant into 2-inch pots than into flats, for a single fungus spore may infect an entire flat, while pots bedded in peat moss so check the spread that an infection is unlikely to kill more than the single plant in the one pot.

By July or August the desirable mosses have usually made growth enough to stop the damping almost entirely, the larger moss species have been weeded out, and there is little further loss. Most of the seedlings remain in the original seed pots through the winter, to be potted off early in March, in preparation for the next sowing. Some pots have been held over until the following summer, and in a few cases the seedlings have remained in them two whole years, with little loss.

Antibiotics are sometimes offered in factory-made form, for checking the growth of undesirable fungi. To apply just the right amount in the right place at the right time, however, is a feat for someone who has little else to occupy his attention. The mosses stand ready to do exactly that, and they charge nothing for their service. Perhaps that is why it has received so little publicity.

My system with seedlings is far from perfect, and if the seed pots are too long neglected, losses may be considerable. However, I think it is the first conscious attempt to make use of the antibiotic properties of the mosses mentioned. Perhaps some experimenter will carry on a little research and find a moss species with even more useful qualities than *Leptobryum pyriforme*, and will find even better ways of encouraging its growth.

Some weedy things commonly included under the name of moss stand all too ready to invade the soil in which seedlings are raised. One of the worst of these is the liverwort *Marchantia polymorpha*, which spreads as a branching green ribbon $\frac{1}{4}$ inch wide, clinging to the surface and eventually putting up miniature palm trees here and there. It should be carved out at once wherever it appears. Other tiny tufts are the prothallia of the common horsetail, to be pulled out as soon as its stalks develop recognizable size.

SEED EXCHANGE 1954

The Seed List is better than ever before, and would have been still better and larger if members could only remember that seeds must reach the Director by November 30th. Such a list, to be useful at all, must reach the members in time so that they can order seeds and receive them not too late for sowing. Time is inevitably consumed in compiling, editing, printing and mailing. Then the mails must carry back the requests, which take more time to fill and send out. Some members prefer to sow in January. Even that is late for Primulas and many other seeds sensitive to delay. So we must compromise with the natural tendency to put things off until some other time.

Some seeds offered are obviously there in response to requests published in Wish Lists of previous issues. Naturally not every wish has been fulfilled, but if in hunting for the seeds of your heart's desire, you don't find them, jot down the names at once, and mail them to the editor for the Wish List to be published in the April issue, trusting that some benevolent soul may find time to collect them for the 1955 list, if told far enough in advance. Remember that this unknown member may live half way around the world.

The Director sends in the following extract from the Report of the Horticultural Congress, author Dr. Lela Barton:

"The difficulties encountered by many rock garden enthusiasts in the germination of seeds may be attributed to any one of several factors (19). Seeds of *Primula obconica* and *Ramonda pyrenaica* require light for germination. Although light is not essential for the germination of seeds of *Draba aizoides*, *Gentiana Lagodechiana*, *Mimulus Langsdorfi*, and *Primula denticulata*, exposure of all these seeds to light during the germination process permits seedling production at temperatures inhibitive in darkness. Other rock garden seeds, such as *Calochortus macrocarpus*, *Camassia Leichtlinii*, and *Lewisia rediviva* germinate only at temperatures of approximately 5 degrees C (42 F). This is in contrast to *Draba alpina*, *Mecanopsis cambrica* and *Gentiana crinita* which possess dormant embryos and must be pre-treated at low temperature, after which germination proceeds at ordinary greenhouse temperature."

Mr. Harkness suggests, "This is apparently an incomplete summary of this reference: SCHROEDER, ELTORA M. AND LELA V. BARTON. Germination and growth of some rock garden plants. Contrib. Boyce Thompson

Inst. 10 235-55. 1939. I wonder if a longer abstract from this paper might not be worth while in the Bulletin."

The editor considers that because of the form in which the material is presented, it would be better for anyone interested to try to obtain a copy, either from a library or from the Boyce Thompson Institute, Yonkers, N. Y.

ALYSSUM LEPIDULUM

BERNARD HARKNESS, ROCHESTER, N. Y.

IN LAST YEAR'S Seed Exchange there was offered, thanks to Ray Williams, Watsonville, California, seed of an Alyssum species under number 18362 of P. Davis. Those who see the Journal of the Royal Horticultural Society know P. Davis to be Peter H. Davis who has made several plant exploring trips to Turkey and the Aegean region.

Not too many were interested in an unknown quantity in Alyssum but those who may now have it growing will perhaps like to know that No. 18362 is now identified with *Alyssum lepidulum*, named by Nyarady in 1928, according to P. H. Davis in his Notes on the Summer Flora of the Aegean in *Notes From the Royal Botanic Garden Edinburgh*, April 1953. The collection note is Mykali (Asiatic Turkey mainland opposite island of Samos) on the mountain, Samsun Dag, on a rocky south slope at 700 to 900 meters elevation, August 20, 1950.

Plants grown here for the Highland Park rock garden made good growth, trailing stems to 12 inches long. Leaves are plentiful along the stem and are long-spatulate, $\frac{3}{4}$ in. long and $\frac{3}{16}$ in. across at the widest part. Stem and leaves are completely covered with the starry hairs, so handsome under a hand lens, of the Alyssum genus, giving the plant its hoary appearance. The next important test is whether it will stand our winter.

KALMIOPSIS LEACHIANA

C. I. SERSANOUS, PORTLAND, OREGON

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THIS NEW GENUS of Ericaceae (Heath Family) is a native of Oregon, and while it was discovered in the Siskiyou Mountains bordering Oregon and California, in the year 1930, not too much has been done in propagating the *Kalmiopsis*, partially due to what was then thought a difficult plant to grow. Max Ruef, a nurseryman, attempted to propagate this plant, and was successful in rooting through cuttings, but after a year or so the cuttings died, and Mr. Ruef becoming discouraged, presumably gave up the culture.

William Borsch and Son, Inc., Maplewood, Oregon, also became interested, and in their 1938 catalog gave a description of the *Kalmiopsis Leachiana*. This catalog illustrated the plant in color on the front cover, and again in black and white on the page giving the description. For some reason, perhaps due to the difficulty in growing the plant, Borsch and Son in all probability gave up, and in the meantime both have passed on.

About fifteen years ago, George Teufel, a prominent greenhouse and holly nurseryman of Portland, perhaps being interested in new plants, purchased some small rooted cuttings and planted them outside for further use and perhaps propagation. These small plants, in their new home and environment, grew very well, and Mr. Teufel has a few of the original purchase. Last spring, early in April, a large specimen, probably 24 inches in diameter and 12 inches in height,

was exhibited at the Gresham Spring Flower Show. Its rosy purple or deep pink bloom, the entire plant being a solid mass of flowers, was an outstanding attraction of the Rhododendron section of this show.

In a visit to Mr. Teufel's nursery by the writer, during the latter part of August, I found Mr. Teufel a very interesting party to engage in conversation, and he has started propagation of the *Kalmiopsis Leachiana*. Quite a number of young plants were observed in his lath house, from which cuttings have been taken. When questioned about this Rhododendron being difficult to grow, he pointed out that the original plants received no particular attention, the usual compost and a small amount of peat moss, mixed with clay loam, was used. At that time the planting was in full sun, with little or no shade. No fertilization was used, and since that time no fertilizers were added. Other than the usual cultivation and water, the plants received no further or particular attention than any other plants received, which he was growing. He did state that he thought Max Ruef, the nurseryman who originally started the plant, overdid the mulching by using 5 to 6 inches of fir needle mulch, and which undoubtedly caused the mortality, in which all of Ruef's plants gradually died out.

The *Kalmiopsis* was discovered by Mr. and Mrs. Leach growing at an elevation of 2,000 to 4,000 feet, and on rocky soil. It is obvious, therefore, that good soil drainage is necessary, and further, one would not expect to find too much humus in rocky soil conditions.

The plant being a low-growing, compact shrub, attaining greater diameter than height, is particularly adapted to rock gardens, where presumably it could extend its root system under rocks, in which conditions the roots would be kept cool and moist during the dry summers.

The *Kalmiopsis* is described in the 1938 catalog of Wm. Borsch and Son, as being "a very rare and local shrub belonging to the Rhododendron family. Found in only a few local spots in the wilds of southern Oregon, it is very hardy and not too particular as to soil, except that we do not recommend soils which are alkaline. Perfect drainage is essential, and if some peat or leaf mold and sand or silt is added to the soil, the shrubs will soon repay you for the extra trouble. Would also give some shade in very hot, dry climates, with occasional sprinklings on hot days. It grows from eight to twelve inches in height, spreading slowly by underground runners and also layered branches. Foliage is small, dark green in color, and the flowers are pink, about the size and color of a good deep pink *Kalmia*, but not as pouchy. Flowering period extends from May to July."

You will learn from this description that alkaline soils are not recommended. You will note further that the planting soil described above is suitable for the growing of any Rhododendron. The writer saved a sample of the soil which was furnished with the plants at the time of planting the *Kalmiopsis* in the Portland Test Garden this Spring. Recently it was analyzed for soil acidity reaction. This soil tested 5.66, which is good pH for most any Rhododendron. Teufel suggests a good friable soil, new ground if possible, that would be suitable for the growing of potatoes.

My conclusions are as follows. Any good soil, loose in nature, and new soil if at all possible, with all other conditions the same as used in growing any Rhododendron, will grow the *Kalmiopsis Leachiana*. It is a slow grower, the same as the dwarf Rhododendrons. It is a good type for rock gardens, and will withstand full sun if it has to be that way. Will take zero temperature and survive. Possibly would be damaged by over irrigation. Good drainage with rocks for the roots to seek moisture is a must.

To those interested in Botany, the name of *Kalmiopsis Leachiana* was given to this rare plant by Alfred Rehder, Editor of the *Arnold Arboretum Journal*,

Harvard University, as a new genus of Ericaceae from Northwest America. He states and I quote, "I propose the name *Kalmiopsis*, referring to its general resemblance to *Kalmia polifolia* Wangeh. In its inflorescence it agrees closely with *Kalmia polifolia* Wangeh., except that it has alternate instead of opposite bracts. The flowering in both species is a short raceme (similar to *Rhododendron racemosum*) terminating last year's branchlets; the bracts decrease in size toward the apex, the lowest being more or less leaf-like; the persistent bractlets surround the pedicels at the base, and together with the bracts act as protecting scales for the flower-buds during the winter. The calyx in both species is five parted, rather large, colored and swelling at the base, forming a ring around the immersed apex of the slender pedicel. The corolla . . . in *Kalmiopsis* is more campanulate and lacking the peculiar pouches of *Kalmia*." Several pages in the Journal of the Arnold Arboretum, vol. 13, are devoted to further botanical description of this plant, but space will not permit further discussion of *Kalmiopsis*.

WE HAVE BUILT ANOTHER ROCK GARDEN

E. L. TOTTEN, HO-HO-KUS, N. J.

ROCK GARDENS are usually built because one desires a rock garden. That was the reason for building my first one. Perhaps if I had used a bit more foresight there would have been no necessity for the second.

To provide a background for the first garden, I used several clumps of our native gray birch, *Betula populifolia* intermingled with *Tsuga canadensis*. The combination lessens the winter drabness, but unfortunately the garden had to be built on a sandstone ledge. As the birches grew and their roots spread, so much moisture and fertility were sapped from the scant soil by them, that any woodland plants in that area gradually faded away.

Out by the outdoor living room, which is almost completely surrounded by tall *Rhododendrons* and hemlocks, was located my catch-all, some seed beds and cold frames—a very unsightly place at best, especially so when entertaining guests for an outdoor meal, and a constant irritation to the more important half of the family. It was decided to move all the rubble to a secluded spot down in the corner of the property, and build a shady rock garden in the vacated spot.

There were several nice limestones under the birches, and others here and there around the place, that had become hidden by shrubbery and bulky plants over the past seventeen years. A surplus of several cubic yards of compost was available, along with many flagstones that were serving no worthwhile purpose. (More about the flagstones later.) All that was needed was a bit of surplus energy.

The compost was moved to the new site by a wheelbarrow, and a mound built about three feet high, and from five to ten feet wide, extending in a half circle for some thirty feet. There are many beautiful plants and shrubs that cannot always be used in a rock garden because of their invasive tendencies, especially those that invade underground. Here is where the flagstones come in. About two feet from the rear of the garden, and at its highest point, the flagstones were placed on end to a depth of two feet or more, and cemented at each overlap. This space was used for the invaders such as *Vancouveria hexandra*, *Vaccinium Vitis-Idaea*, various *Epimedium*, *Sarcococca* and others.

When the mound was completed, all of the stones put in place and made ready for planting, the robbing of other parts of the old garden for plant material was started. It was surprising that almost two-thirds of the new garden was planted with surplus material from the old.

Now that I have a northern exposure, I expect to try some of the choice things that heretofore have been of short duration, among them some of the more fussy *Saxifraga*, *Ramonda*, *Chiogenes*, etc.

Those plants whose foliage becomes unattractive after flowering, were so placed that the flower stem would protrude above a stone, and hide most of the foliage. For the same reason, the bulbous material is made up of those whose foliage quickly disappears, such as *Mertensia longiflora*, *Dicentra canadensis*, *D. Cucullaria*, *Galanthus*, *Erythroniums*, *Claytonia*, *Eranthis*, *Cyclamen*, etc.

For shrubs, dwarf *Rhododendrons*, *Leiophyllum buxifolium* (a prostrate and contorted form from the New Jersey pine barrens), *Lithospermum diffusum*, *Corema Conradii*, *Buxus microphylla koreana*, *B. microphylla nana compacta*, *Andromeda polifolia nana*, *Daphne Cneorum alba* (prostrate), *Cornus canadensis*, *Gaultheria procumbens*, *Cassiope Mertensiana*, *Tsuga canadensis prostrata*, *Gaylussacia brachycera*, *Vaccinium crassifolium*, *V. Vitis-Idaea minus*, *Potentilla tridentata* and *Skimmia japonica* were used.

At the front and lower part of the garden, where moisture can be maintained as desired, are patches of various *Coptis*, *Houstonia caerulea*, *Iris verna*, *I. gracilipes alba*, *Bellium bellidioides*, *Primula Juliana* hybrids, *Linnaea borealis americana*, etc. Where it will not interfere with tiny things, *Mitchella repens* covers a large portion of the garden. Around the acid lovers, the soil was dressed with a liberal covering of hemlock needles, a few pine cones, and a deer antler thrown casually about.

No, I did not forget the ferns. Several dwarf types were used whenever an appropriate setting for them developed. Several western species are being tried for hardiness, and they along with others will be added if they survive the winter without protection.

The rabbit fence is erected, and everything ready for winter hibernation. I think I shall go along with them.

LETTERS TO THE EDITOR

Botanic Gardens
University of British Col.
Vancouver, B. C., Canada

I beg to acknowledge receipt of the Bulletin of the A.R.G.S., which I have read with great delight. On page 105, under the heading Another Thought About the Peat Garden, I noticed a statement which certainly ought to be taken with a pinch of salt. Since the article is not signed by anyone, nor the writer having stated the locality in which the plant refuses to grow, it is a bit difficult to give advice.

Why *Linnaea borealis* must be grown when *Linnaea americana grandiflora* (so called, I think) is there for the asking, I cannot understand. Both are beautiful, both have the all-pervading perfume, but the latter grows like a weed, while the former may refuse to do so. Undersigned was busy making his garden in 1928. The lay of the land produced a half-circular area with semi-shade (Dogwood cut off the direct sunshine to the south). Having the problem of covering the semi-circular wall 4 feet high and 20 feet long, I made certain that food was present (excellent loam 8 inches deep). In spring I went to a vacant lot, ripped up 14 long training branches of *Linnaea*, planted them in the loam.

Since that time the dogwood tree, some *Mahonia aquifolium*, *Rhododendron decorum*, and other material have taken their share of the nourishment. Most of the *Linnaea* has departed, but there still remain two or three patches. In the place of the *Linnaea* I have planted *Cyclamen neapolitanum*, *n. album*, and *coum*. These are definitely easier, and having graduated, give me greater pleasure over a longer period of time.

Coming back to boreal plants, many are more difficult than their counterparts, but no doubt peat may help. To add another bit to the plants which must have peat, why not try *Calceolaria Darwinii*? I wish anyone wanting to grow *Linnaea* all the success he deserves.

Sincerely yours,

GEO. B. BOVING

The unsigned article was written by the editor. He intended the name *Linnaea borealis* to cover all local forms on which recent botanists have been trying to tack new names, in order to get their own signatures in print, and in spite of the annoyance they cause the rest of us. It is true that some geographical races are easier to handle than others, also true that any individual plant is a little different from any other individual plant in its response to cultivation, which keeps us perpetually hoping that sooner or later an easier form will turn up. *Linnaea* can be grown in most of Canada, but in the United States, except in a few northern and western corners, it refuses to thrive under ordinary conditions, and with most of us will not live at all, in spite of all we can do for it.

It is sometimes difficult for us to distinguish between actual beauty in a plant, and that sort of attraction which has been built up for it by sentiment, literary allusion, or an odd kind of patriotism. It is fortunate that plants vary so in their appeal, for thereby they bring pleasure to all sorts of people. *Linnaea borealis*, the uncorrupted species, offers us beauty, fragrance, historic and literary associations beyond those of most other plants, and for those who think of themselves primarily as citizens of small, local areas, the advantage of being a native in almost any northern country.

HYBRIDS AGAIN

WITH INCREASING FREQUENCY we read two kinds of ideas about hybrids, mutually contradictory, and both wrong. On the one hand we see advertisements of seeds and plants assuming that because a plant is a hybrid, it must therefore be something choice and desirable. On the other appear tired comments to the effect that all hybrids are fat and ugly, and that true beauty is found only in species. How can two such opposite and incorrect notions have grown up side by side?

We have hybrid Delphiniums, hybrid roses, hybrid Rhododendrons, hybrid corn, and all our fruits are essentially hybrid. How can anyone suppose that all these are all good or all bad? Those who make such careless statements do not understand the nature of hybridity.

A hybrid occurs when any plant or other creature is bred with another which does not belong to the same species or race or strain. Also any progeny of a hybrid is a hybrid. So many different kinds of individuals are included in this definition, that to explain them to any person except a professional breeder or a geneticist would result only in dizziness and confusion for both the explainer and the explainee. Singling out a few cases, however, may clear the air a little.

The object of breeding plants is to produce something which the public will like better than the plants they now have. The method in its simplest form is easy to understand. The breeder plants a great many seeds, raises plants from them, then looks over all he has raised in the hope of finding one or two that are better than all the rest. Who decides whether they are really better? First the breeder, then the plant-buying public. If the breeder can guess what the public will like, and produce it for the public, he will thrive. If he chooses plants at which the public turns up its collective nose, he will fail. So far all is clear and easy to comprehend.

Seeds from one plant will give better material to select among than seeds from another. If an exceptionally fine specimen is artificially crossed with another desirable specimen of the same species or strain, the resulting seedlings will probably average superior to those bred from ordinary unselected plants. But when the same kind of selection is made in a second, third and fourth generation, the improvement becomes less and less marked, until a limit is reached after which it does not pay to pursue this method further.

If still better plants are to be bred, some other method must be found, and it has been found in hybridizing. But now nothing is either clear or simple until you make a special study of the sciences involved. Only closely related species or strains within a species can be expected to cross with each other. Crazy notions like crossing a tomato with a potato are merely nonsense, though sometimes unexpectedly distant species are hybridized, and the result is nearly always a curiosity with no value whatever.

Treatment with X-rays or chemical poisons has also been found to promote changes in plants, nothing magical, occasionally something useful, but for the most part, just aimless changes.

The first result of crossing two species or strains is usually a generation all much alike, in some respects an average between the parents. Many excellent plants have come out of this first simple cross, but more often the result is inferior to either parent. The inner nature of the two plants, and not the breeder, decides what will be produced. But cross these mongrels with each other, or with other mongrels, and a strange thing happens. Instead of a generation all much alike, all sorts of different plants appear. All imaginable recombinations of the different qualities of the two original species or strains are likely to develop, and two seedlings side by side may be utterly different in general aspect.

If the plants are woody or perennial, the breeder now has a chance to pick out something new and attractive, and make a clone of it—that is, propagate it by cuttings, grafts or layers, or in the case of perennials, by division of the roots. Each plant so produced is a part of the one originally selected and should look exactly like it. With annuals the breeder must select two or more, breed them together, and carry them on for several generations, keeping only the best each year, until the new strain comes true from seed.

But in each case the breeder selects what he believes will be a successful plant with the public. If the breeder and the public like fat and blatant plants, the ones selected will answer that description. To say, as some do, that all hybrids are fat and blatant, is to misunderstand the nature of hybrids. If the breeder and the public preferred shy and delicate beauty, he could pick from the same ten thousand seedlings the shy and delicate instead of the fat and blatant. If your taste differs from that of the general public, you should breed your own plants or arrange with a breeder to produce for you the kind you like.

Now for the other side of the picture. When a breeder has selected what he believes to be the one or two best plants, he should destroy the 9,998 which he has rejected. But unscrupulous breeders know that the public misunderstands the nature of hybrids, believing them to be superior plants instead of the mongrels, mostly worthless, which they really are. The breeder cannot be prosecuted for selling the trash as hybrids, because according to the dictionary they are hybrids. So too often he sells them. Other breeders sell a great clutter of second and third best plants under clonal names, more or less justified.

To further complicate matters, we have hybrid corn, bred in a totally different way for an entirely different reason. It has increased the wealth of our country by billions of dollars. However, attempts to apply the same practices to other crops and to horticultural subjects have not brought any like success, but more often complete failure.

Some plants cannot be improved by any sort of hybridizing, either because they refuse to breed with any kind except their own, or because the only species with which they will cross breed are inferior in all respects. There is no good to be gained from crossing unless one parent has some desirable trait which can be added with advantage to the best features of the other parent. To this rule there are a few exceptions, including the one that accounts for hybrid corn.

When two closely related species or two distinct and inbred strains are crossed together, the first generation often exhibits what is known as hybrid vigor. Rapid growth, large size, freedom from disease may result in various degrees. Sometimes the hybrid is hardier than either parent, sometimes less hardy. A gain in hardness alone may sometimes prove supremely important, opening up for a given type of plant vast areas where it could not previously survive the climate. In the case of hybrid corn, increased crop yield proved to be a bonanza.

So instead of assuming that all hybrids are good, or that all hybrids are bad, we should judge each one on its merits. Most of them are bad, some supremely good.

ALPINES ON MT. PISGAH, VERMONT

GRACE F. BABE, PORTLAND, MAINE

MT. PISGAH is situated on Lake Willoughby, directly north of St. Johnsbury and not far from the New Hampshire border. The lake was a beautiful blue on June 28th, certainly justifying its popular name of "The Lake Lucerne of Vermont." At its southern end, steep mountains rise sharply from each side, Mt. Hor on the left, Mt. Pisgah on the right. Both are thickly wooded with sheer rock cliffs exposed here and there. A narrow road winds around the base of Mt. Pisgah, with glimpses of fine sandy beaches, and a cluster of tourist cabins where our group met for a picnic lunch and plant exchange.

The party included several members of the New England Round Robin and their families (some on vacation), and those who climbed were James Mitchell, veteran collector and leader, Grace Butcher and Harold Rugg, also experienced climbers, Angie and Alfred Pease, Dorothy Stillwell and daughter Judy, Alice Baylor, Dick Darling, and the writer and son Bruce.

The open rock cliffs which were our destination were in plain sight above the woods, but practically straight overhead, some 800 feet above the road! Some of the group scrambled up a dry stream bed studded with boulders of all sizes, others including myself preferred the woods, pulling ourselves up the slippery mountainside by tree and shrub branches, grateful for the shade. The climb seemed steeper but much shorter than that at Smugglers Notch. Once up, we found easy collecting conditions with a wide, gently sloping "beach" or talus at the base of the cliffs. The cliffs themselves were terraced in broken narrow ledges, dripping from top to bottom with spring water which looked inviting that hot summer's day, but was actually lukewarm and not very appetizing. At each side were steep gravelly slopes curving around the ends of the cliffs, with outcropping ledges and half-buried boulders, and a narrow strip of woodland which climbed out of sight over the top of the mountain, and more cliffs visible beyond the woods.

The alpine plants were growing in all sorts of situations. Many were in damp moss and dripping mud, plastered against the vertical face of the rock, along the ledges, and in every crevice and hollow. Others grew in the open talus, sometimes sheltered by boulders or smaller fragments of rock. Still others were growing in the shade of tall perennials and shrubs near the edge of the woods, and these were usually the largest clumps of all.

The greatest lure for us was the little *Primula mistassinica*, named for a Canadian lake where it also grows in profusion. This is a "little sister" of *P. farinosa*, much more diminutive, and lacking the silvery meal on its foliage. The tiny flowers, on 2 to 4-inch stems, are light pink, varying sometimes to white or rarely to deeper rose. They were just past blooming and developing seedpods in late June, but fat buds for next spring would be forming in each rosette by August. There were many large clumps of rounded thickish leaves of *Parnassia caroliniana* var. *montana*, with a few showing buds. These would bloom during August with pretty cream-white saucers on four-to-six inch stems.

A great rarity was *Braya humilis*, this being the only known station in the eastern United States, with one other found in recent years in Colorado, all others farther north in Canada. This was more attractive than expected, rather pretty white *Draba*-flowers over whisps of grassy leaves growing in tufts. Here too were *Viola nephrophylla*, and dainty *Lobelia Kalmii*, the last with almost invisible grassy stems. I brought this home by sheer good luck, tangled with other plants, and was delighted when it bloomed in August with pretty little bright lilac flowers, two-lipped with a white center patch.

There were many bright green tufts and yellow flowers of *Saxifraga aizoides*, and fine-leaved clumps of *Erigeron hyssopifolius* with tiny white daisies which were often quite pink-tinted in bud, and very dwarfed shrubs of *Potentilla fruticosa*. Many taller and less - thrilling plants were also mingled with the alpiners,—wild columbine, bluebells, meadow-rue which seemed rather pink-tinted, one or more goldenrods, and the handsome and rather surprising Starry Solomon-seal, *Smilacina stellata*, with narrow shining leaves of dark green, and berries pale yellow at that season, with six stripes of dark red.

It seemed to me that the plants changed almost abruptly from the area of the cliffs and the ground immediately below, to the rough north-side slope which faced south and would be rather sunny and hot. Here were silky green *Artemisia*s, probably the same as at Smugglers but lacking the silver shading, *Astragalus Blakei* with its stiff stems of gray-green leaflets and lavender pea-blossoms, and *Clematis verticillaris* sending out long exploratory runners. Most of these were securely wedged into crevices, but luckily we found seedlings in the loose gravel which were easily collected with root systems intact. Only one tiny scrap of *Saxifraga oppositifolia* was seen on this slope, but Mr. Mitchell found plants in another setting. A dwarf wild rose rambled along the woods edge, probably *Rosa blanda*, said to be comparatively thornless, but all we saw had small prickles!

The view from this slope was literally breath-taking and some of us felt much more secure if we were well anchored to a big rock while looking down to the beautiful lake right under our feet! A small white crescent beach showed, and the cliffs of Mt. Hor were directly opposite.

On the shadier north-facing slope were many shrubby honeysuckles and what appeared to be a dogbane, *Apocynum* sp. with smallish clusters of pretty white flowers at the ends of the wide-branching stems. These provided the light shade which the alpiners seemed to like, as mentioned before. The delicate little bladder fern was the only one noticed among the alpiners. In the woods there was very little plant growth. Baneberries, several violets including the round-leaved yellow, wild onion, with maidenhair, Christmas ferns, and rattlesnake ferns, were about all that were seen. Bladder Campion was seen everywhere along the Vermont road, very brownish in color instead of cool gray, perhaps scotched by the drouth, since a collected plant soon turned gray with more watering.

It will be good news to many old friends of Mr. Mitchell that he is building up his alpine nursery again, and will soon be offering many of these choice natives, along with other treasures from the world over.

There is a garden on Cape Cod which exemplifies many an alpine writer's comment: sunny and southern, with molding slopes racing to water's edge and a cool breeze from off the water to refresh. This is the garden of Prof. Stephen Hamblin which was visited by the New England Unit on June 20th. Facing Long Pond, the rather steep slopes of the garden are artistically tiered in terraces. ("This makes the garden fall into sections, definite ones, but unnoticed by anyone except the owner," says Mr. Hamblin, "which is of immense help in diagraming or cataloguing the garden.") These in turn have vast numbers of rock plants, especially species of *Thymus*, *Dianthus*, *Penstemon*, and members of the composite family. Abruptly from the water's edge rise steps to the top of the slope and fragrant plants and shrubs, handsome mats, and graceful flowering stalks of species of *Jasione* and *Phyteuma* make these steps extremely beautiful. Nestled at the base of a shrub were several gleaming clumps of *Hypericum Buckleii*, and, too, were several species of *Santolina*. These shrubby herbs are handsome things for summer rock gardens.

The meeting was attended by Mrs. Sidney Baylor, Mrs. Lester Chaffin and a friend, Mrs. Orvis Collins and a friend, Mr. and Mrs. Dwight Granger, Mr. Edward Knotts and Dr. Helen Scorgie. It was a pleasant day, very warm but extremely enjoyable. We thank Mr. Hamblin for his lovely garden and kind effort in presenting it to us.

EDWARD KNOTTS

NORTHWESTERN UNIT REPORT

Since our letter in April we have had several very interesting monthly meetings, a picnic, mountain trip and our annual dinner and election of officers.

One of the meetings was a conducted tour of the gardens of Mr. and Mrs. Carl English with their amazing variety of rare and beautiful plants, most of which they have collected themselves. Our picnic was held on the shores of Lake Sammamish at the home of Mr. and Mrs. F. I. Sprague. It was an evening of fine fellowship and fine food.

The field trip, the third for the year, was at Summerland on Mt. Rainier. We drove up the Chinook Pass highway to White River Bridge and crossed the bridge to park at Frying Pan Creek. The park entrance was lovely with beautiful hemlocks, red elderberry and white blooms of everlasting. The trail was smooth and wide, carpeted with evergreen needles. The sides were decorated with low blueberry plants and here and there clumps of *Linnaea* which scented the air. The sound of rushing water was in our ears for the whole climb which was four and two-tenths miles. The sun shone through the trees in places making shadows across the path. The ground was carpeted with blueberry plants, moss and many evergreen seedlings, mostly hemlock, grand fir and further up, alpine fir. We saw ferns, *Actaea*, huckleberry, cedar, mountain hemlock and spruce. Juncoes flitted ahead of us through the branches.

There were lupine, forget-me-nots, *Penstemon* and many other flowers. Higher up the avalanche lilies had just finished blooming. There were Indian paint brush, wild carrot, true Solomon seal, *Rhododendron abflorum* and bear grass. We climbed up to the shelter which was at an elevation of 5440 feet. Several of the party were there to greet us, some having spent the night at the shelter. We reached there about eleven o'clock.

The mountain sides were covered with snow all around us and the fields were blue with lupine interspersed with *Pedicularis*, bear grass and pink daisies. There was a swift stream bubbling through the rocks. Clumps of *Mimulus* were

very pretty with their rosy blooms at the base of huge gray boulders. To add interest, there was a big black bear prowling around and some of the party saw lots of goat hair. The alpine firs were lovely standing in family groups on the slopes, their purple cones erect on the branches. The air was very fragrant.

We enjoyed our lunch after the climb and then scouted around for two or three hours before going back down.

Mt. Rainier was truly noble seen at such close range.

Our annual dinner culminated in the election of the following officers for the ensuing year:

President—Mr. Page H. Ballard, Box 3794, Issaquah, Wash.

Program Chairman—Margaret Watt, 1371 35th Ave., So. Seattle 44, Wash.

Secretary-Treasurer—Mrs. Clarence Larsen, 3883 W. Mercer Way, Mercer Island, Wash.

Trip Recorder—Mrs. A. M. Sutton, 9698 N. Beach Drive, Seattle 7, Wash.

Our year concludes with a talk on Northwest birds by Mr. Harry Higman, noted author and authority on bird life.

MARIAN LARSEN, *Sec.-Treas.*

In the article by Helen M. Fox, October 1953, credit for the illustrations should have been given to The Land of Israel by Feinbrun and Zohary, published by the Palestine Journal of Botany, Jerusalem.

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