

# BULLETIN

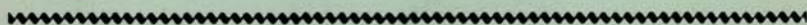
of the

## AMERICAN ROCK GARDEN SOCIETY

Vol. 11

JANUARY, 1953

No. 1



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# BULLETIN

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## AMERICAN ROCK GARDEN SOCIETY

G. G. Nearing, Editor

VOL. 11

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### THE SHADY ROCK GARDEN AT GLADWYNE

MARY G. HENRY, GLADWYNE, PA.

THE SHADY ROCK GARDEN at Gladwyne never was planned, it just sort of evolved. A place to plant *Trillium*, long one of my favorite flowers, was the reason for its beginning over 20 years ago. It is on a gently sloping rocky hillside with high shade overhead and a tiny stream trickles over the rocks.

There are over fifty species and varieties of *Trillium* growing here and to my way of thinking every one is attractive and distinctive.

Perhaps the most gorgeous one of them all is the large double white flowered *Trillium grandiflorum*. Like the type it is an easy grower and quick increaser as I now have about 20 instead of one. *T. vaseyi* with its big flowers of wine red velvet is stunning too, and its white variety makes a fine contrast.

There are many nice color forms of *T. erectum* besides the handsome red type. A flesh pink one is especially charming, but the white with heliotrope center is just as handsome. It is here also in several shades of yellow and there are several white varieties. All are lovely and all are good growers.

*T. catesbaei* is another stunning species. Its flowers are usually pure rose pink and droop gracefully. The pure white flowered one is a beauty too. A form with upright blossoms is especially conspicuous. A tiny little *Trillium* that I found in sandy oak barrens, much to my surprise, just north of the Florida border, has miniature pure white flowers. The whole plant is only about six inches tall. This little jewel may be a new variety of *T. catesbaei*, or it may be a distinct species. It maintains its dwarf stature in the moister richer soil at Gladwyne.

The quaint *T. stamineum* and *T. viride*, although not showy are very appealing. While the nodding flowers of *T. cernuum* are more or less "lost" beneath the leaves, the foliage is bold and handsome. When I found it *T. erectum* was growing nearby so I promptly searched for, and found, some hybrids. They were definitely intermediate in color, in shape, and in the way the flowers were held.

The white flowers of *T. pusillum* and *T. pusillum* var. *virginianum* decorate the small space they occupy. *T. ozarkanum*, a near relative, has the added

charm of fragrance and thrives and increases in two situations in the dry stony soil of the sunny Rock Garden.

*T. gleasoni* (*T. flexipes*?) from Missouri is another large and magnificent white flowered Trillium that I would not willingly do without. *T. luteum* is very pretty too. Others are *T. maculatum* with red, also pure butter yellow flowers, *T. hugeri*, (*T. cuneatum*?) red. The very late flowering *T. discolor* with creamy flowers of unusual shape, *T. recurvatum*, *T. stamineum*, and the precious little early flowering *T. nivale* are all, like the others, plants of exquisite symmetry and grace. There are others here and some that have never been identified.

Handsome as Trilliums are, I must admit that *Disporum maculatum* is second to no plant I know for sheer ethereal beauty. Its fair sized pearl-white flowers are covered with tiny ruby-red dots. Also like many liliaceous plants, mice enjoy eating its roots below ground and rabbits devour them above ground.

A close relative of *Disporum* is *Uvularia grandiflora* with large butter-yellow flowers or else pale lemon flowers. It is a "must have" which makes large permanent showy clumps. There is a large attractive pale yellow flowered *Uvularia* from the Georgia Mountains with deliciously fragrant flowers that so far is unidentified. It is very worth while. *U. perfoliata* is mildly nice and *Streptopus roseus* is also a lesser beauty.

*Convallaria montana*, our own beautiful and fragrant native "Lily of the Valley", is a lovely addition to a Shady Rock Garden. All Erythroniums are utterly delightful. I have several species from the Southeastern States and a number from the Northwest. As their identifications are rather uncertain I can only say all are desirable. *Chamaelirium luteum*, the tall slender "Fairy Wand" makes a conspicuous "accent plant" and a little clump of them is highly ornamental.

*Iris cristata* is a gem for the shady and semi-shady Rock Garden. It does need an uncrowded area, a few feet where it will spread neatly. It blooms best in a soil that goes slightly dry in summer. There are four white varieties here, a white with yellow crest, a creamy white, a bluish white and a dwarf fragrant one I found in Oklahoma. I also found a deeply colored one and a bi-colored one. This latter I placed in "the trade as", "Crested Fairy" and the creamy one as "Crested Ivory." They form a very lovely group of spring flowers and the contrasting colors are soft and lovely.

The pretty little *Anemonella thalictroides* is native in the Rock Garden. Those I found in Oklahoma have larger flowers that are colored a fine rose pink. *Isopyrum biternatum* while not so showy has a delicate grace few plants have. Both of these add their fleeting beauty in early spring.

Away from small and fragile treasures, but where their stately spires can be seen, *Cimicifuga racemosa* is native here. All I have done was to thin them out a bit. They have rewarded me by making magnificent many-stemmed clumps 8 feet high and more. Knowing of my fondness for these fine plants Dr. Wherry brought me *C. cordifolia* with much bolder foliage and even handsomer flowers. Last autumn he helped me to collect *C. americana*, an improvement on the others because of its delicious fragrance and later flowering season.

The *Cimicifuga* are valuable for their late-in-the-season flowers. The first named one blooms in July and the latter two in September. No one who has seen them rising uncrowdedly among rocks and trees leaning their graceful white spires towards the light, would willingly do without them. They are superb.

*Delphinium tricorne*, a bright and beautiful little Delphinium, ideally suited to the Shady Rock Garden, has been neglected by our horticulturists for no reason

at all. Deep bright blue flowers are none too plentiful. This one is easy to grow, and is not beset by any "blacks" or "yellows." The even dwarfer white counterpart from eastern Tennessee is another gem and seems to me to be distinct.

The striking foliage of *Jeffersonia diphylla* is its most attractive feature as the small white flowers come and go so quickly that some seasons I never see them at all. The flowers of *Sanguinaria canadensis* are the very epitome of fresh spring-time beauty. Fortunately it belongs in our woodlands.

*Stylophorum diphyllum* never fails to display its pretty and cheerful bright golden yellow blossoms. Though it self-sows and its flowers are large and showy they are never coarse. The foliage too is beautifully cut. No shady Rock Garden should be without it. I found this in Missouri growing on a steep slope with *Trillium gleasoni*.

The utterly dainty little *Dicentra cucullaria* is a plant well worth an effort to make it happy. Usually it is white but a fine pink one grows in Oklahoma.

Although *Dicentra eximia* with pink flowers is decidedly pretty as are also the white and pinky white varieties, they spread so freely by seed that they are troublesome to control.

No gardens are complete without violets. At one time there were 65 species and varieties at Gladwyne. A purchased plant brought a fungus disease which devastated many of them but there are still over 40 kinds here. Only a few of outstanding merit will be mentioned. *Viola rotundifolia*, yellow flowers with evergreen foliage, *V. conspersa*, light blue, *V. rostrata*, one of the most attractive of all, especially its better forms, *V. tripartita*, with unusual divided foliage and yellow flowers, *V. walteri*, although it grows in shade where it comes from, is happier here in sun. It has adorable little flowers and makes wide spreading mats of small tidy ornamental leaves that are evergreen. When I found this violet in Arkansas I was told it was the first record from the state. Of course *V. pedata* is a "must" wherever it thrives but with me it does best in full sun.

*Saxifraga virginiensis* with its white flowers rising from green rosettes is a very welcome little plant, native to Gladwyne.

*Polemonium reptans* is indispensable, because of its graceful fern like foliage and also on account of its very lovely wide open, well shaped delicious pale lavender-blue flowers, plentifully produced early in the year. The white-flowered variety is just as lovely and so is the white one with a blue center.

The pretty, little creeper *Meehania cordata* with its comparatively large soft lavender flowers is slow to establish itself but it is worthy of a big effort to make it at home in order that we may enjoy its splendid evergreen carpet and unusual looking flowers.

For many years the Shady Rock Garden was essentially a spring garden. By midsummer the foliage of many of the plants had vanished, leaving the hillside quite bare. I started on a rather intensive search for dwarf evergreen plants of distinctive habit which would grow in the shade. I hunted in many states, in the forests, on mountains and valleys and in catalogues too. *Galax aphylla* and *Shortia galacifolia* are both of immeasurable value. Both of these well known plants have exceptionally beautiful evergreen foliage and extremely pretty flowers.

Of all evergreen perennials grown for foliage alone surely *Asarum virginicum* must rank near the top. It makes compact regular clusters of perfectly stunning leaves and it spreads slowly. The roundish leaves are dark green, beautifully marked in silvery gray. There are many different and striking patterns and designs. As if to make them more conspicuous the leaves are so glossy they look as if each one was varnished. *A. memmingeri* is a smaller beauty with unmarked

deep green leaves. Others, too, all very useful, are thriving here. *A. lewisii*, *A. arifolium* and *A. speciosum*.

Hepaticas have great "365 days a year" beauty. They almost always seem to thrive and they can be tucked in almost anywhere about trees and rocks and invariably look at home. The beautiful blossoms emerging from tufts of silvery fur are quite heavenly early in the year. The flowers come in shades of blue, also pure white. Years ago I saw a beautiful plant with rose-pink flowers. Unfortunately I had no garden in those days and I have seen none since. The dark patterns on the leaves of Hepaticas vary considerably, some being more ornamental than others. It is fascinating to hunt Hepaticas and select them for beauty and variety of foliage.

All the Heucheras that I have seen so far have excellent ornamental evergreen foliage. The eastern ones do well in shade. The western ones prefer sun here. *H. americana* is a fast and robust grower and those with conspicuous dark markings on the leaves are greatly to be preferred. They self-sow readily and by pulling out the common ones frequently, the color forms can be improved. However the best forms of *H. pubescens* are even better than the foregoing. Dr. Wherry brought me a beauty. The young foliage is deep bright carmine and much of this rich color remains in the leaves all season. The flower spikes of these two Heucheras can hardly be called ornamental but they are graceful and interesting. However in *Tiarella cordifolia*, a relative, the flower spikes are enchantingly lovely, white flowers with orange anthers and they shade to pink in the bud stage. Some are quite pink. This is a very lovely plant, well named foam flower. It has good evergreen foliage and spreads nicely. The excellent variety *T. collina* grows in tufts and makes no runners. *T. wherryi* is another attractive member of this family.

*Phlox divaricata* has earned its popularity. It is one of the most delightful of all spring flowers. Not the least of its charms is its evergreen foliage. But it is the color of the flowers, an excessively luscious soft lavender-blue, that makes it famous. There is a fine pure white one here, also a marvelous pure soft rose-pink found by my daughter, Mary H. Davis, in Virginia. The mid-western variety, *P. divaricata laphamii*, is quite different. It is a far more vigorous grower and the flowers are deep, rich in color, and varied, sometimes verging on deep Phlox-pink. The colors always blend and it is quite magnificent.

*Phlox stolonifera*, the type one usually sees, is not always especially attractive. but I was lucky enough to run across two beauties in the wild. One has soft pale blue flowers like *P. divaricata* and the other has clear bright pink blossoms that are free from magenta. These both have wonderfully formed circular flowers. Their habit is far more desirable than that of *P. divaricata*. They only grow about half the height and so neither flower-stems or leafy stems sprawl or flop over as do those of *P. divaricata* after a rain or when the first flush of bloom has passed. I am calling the blue one *P. stolonifera* "Blue Ridge" and I think it one of the very finest of all plants for the Shady Rock Garden. The "Pink Ridge" too is fine but everyone likes the blue one best. The foliage is prostrate, evergreen and spreads neatly. It has one requisite, a soil that contains a little, just a trifle, of moisture. It simply cannot bear to bake or dry out.

The pretty little prostrate creeper *Mitchella repens* is one of the best of all ground covers and is native here.

Years ago *Linnaea borealis* made an enchanting mat about 24 inches across. Mice ate it all, every bit, under the protection of a heavy fall of snow! I have it again in the Trial Garden, where it is growing nicely, so it can be tried once more in the Shady Rock Garden. I found an adorable white flowered one once but it went to its long home one summer when I was away.

Of course, however, I must not forget our quaint and beloved "Jack-in-the-Pulpit", *Arisaema triphyllum*, that thrives so willingly in almost any soil. It is always attractive, but sometimes it becomes a "weed."

Other plants for the Shady Rock Garden are crowding into my mind, even as I am trying to end these notes and I almost omitted *Cymophyllus frazeri*, with its splendid evergreen foliage and spikes of cream white flowers. And the lovely *Clintonia umbellulata* should be included also.

Ferns and Trilliums, the association is a natural one and each complements the other. Trilliums came here first, but they seemed to need something to make them appear at home. That "something" was Ferns, which have a beautiful way of making a woodland appear wild and untrammelled, and, too, of tying rocks and earth together. The larger species are superb in the background and the smaller ones blend beautifully in among the spring flowers. Young fronds grow upright and later in summer they bend their leaves to gracefully cover the bare places left by the ripened foliage of some of the early flowers.

As evergreen ferns have the much to be desired "year round" appeal, few deciduous ones are grown here. Big, handsome and easy to grow *Dryopteris* comes to my mind the first of all. *Dryopteris marginalis* and its even more ornamental variety, *D.m.elegans*, are hard to beat. They are large enough for a background planting and beautiful enough for a conspicuous position, where something extra fine is needed at the turning of a path, or to separate plantings. *D. intermedia* is another super-beauty and it, like *D. marginalis*, makes those great wonderfully tufted rosettes that are sometimes so neat and regular that it makes us realize that Nature is the greatest designer of all. Maybe *D. floridana* (from Florida) with its stunning glossy fronds is the most beautiful of all in this splendid genus.

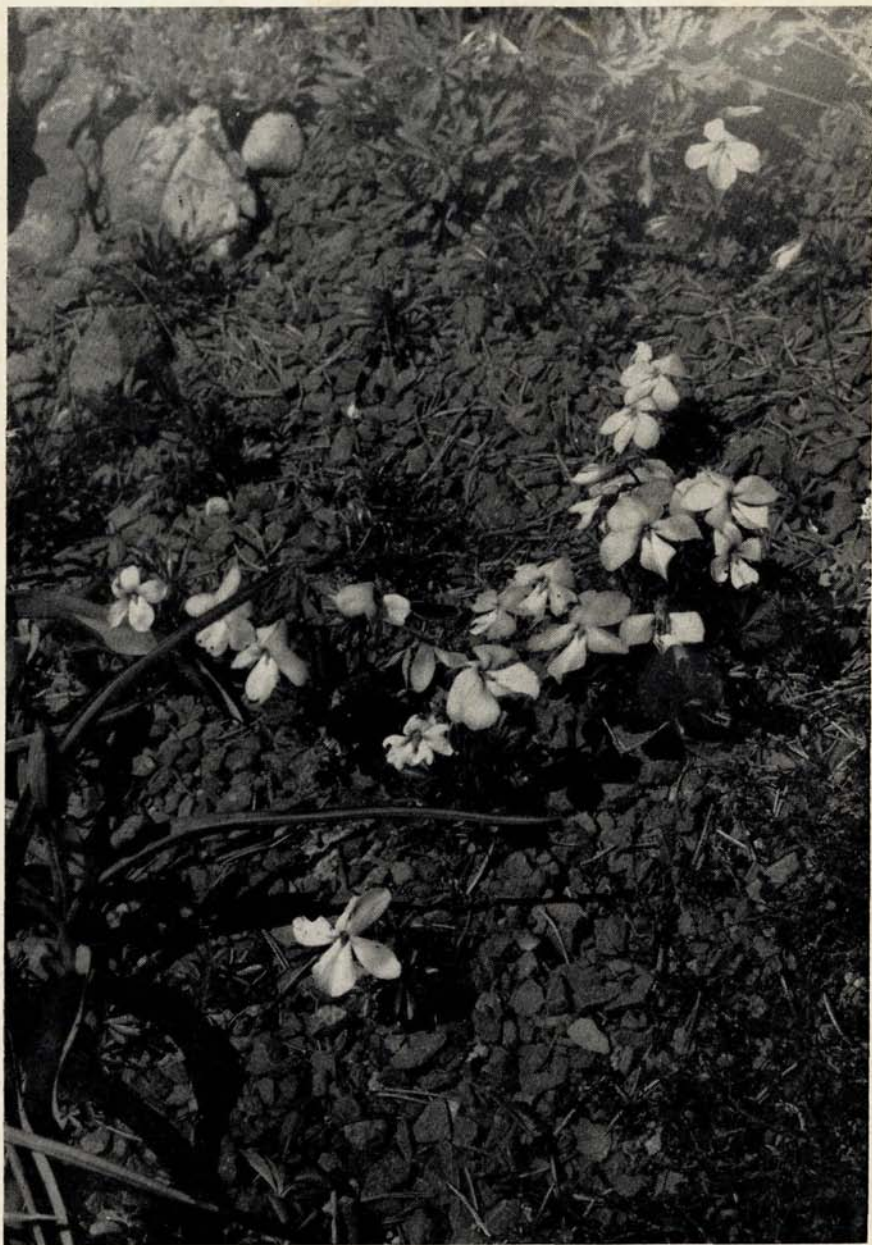
*Asplenium platyneuron*, a welcome little native here, self-plants its pretty rosettes almost anywhere and they always look in place. *A.p. baculum-rubrum* much larger and conspicuously lovely, produce fronds that grow like a little green fountain. In grace and beauty it is second to none. *A. trichomanes* is represented here by but one plant that has persisted for years, a cherished gem.

*Polystichum acrostichoides* has many handsome and uncommon forms, which is not surprising in a plant which grows plentifully over a wide range. All or any of these forms should be used and propagated whenever obtainable, they are a vast improvement over the type. The most outstandingly beautiful of all those that I have seen is a bipinnate form that was given to me by Dr. Carroll Wood. The *Polystichum* self-sow generously and soon become pretty and useful inhabitants of a shady hillside.

The only deciduous fern I will mention is *Adiantum pedatum*, our lovely Maiden Hair Fern. No woodland garden would be complete without this exquisite fern. It should be planted wherever it can be made to feel and look at home. Fortunately it is easy to obtain from dealers and although sometimes a little slow in getting started, when once established it spreads and self-sows generously. Some years ago, when in the Virginia Mountains, I found an outstandingly beautiful form of this fern. The young spring-grown fronds held high, just before the leaves unfurled, appeared like round blood-red flowers which indeed, from a short distance, I thought they were, rising from a stony turf of dwarf *Vaccinium*, etc.

The foregoing plants are all growing and seem happy here. There are others, too, but maybe the article is too long already.

The Rock Garden, The Shady Rock Garden and The Southern Garden are now established as The Henry Foundation for Botanical Research.



The birdfoot violet, *Viola pedata*, a plant of the pine barrens and elsewhere, prized for the sunny rock garden.



## UNSOLVED MYSTERIES OF THE PINE BARRENS

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

PINE BARRENS stretch along the Atlantic Coast intermittently from Cape Cod and the islands to the Gulf of Mexico, with those of New Jersey receiving the lion's share of botanical attention, partly because they occupy perhaps the largest uninterrupted area of typical barren conditions, partly because of easy access from the great centers of population, but even more because of the large number of rarities concentrated there. Pine barrens are not all alike, but have certain characteristics in common, and a vegetation similar in the main.

For centuries our rivers have been flooding into the sea a vast volume of soil eroded from the Appalachian Mountains, and the waves have been tossing back a portion of it, chiefly sand. So miles of sand flats keep building out from the eastern edge of our continent, shaped by ocean currents and by the gradual rising or sinking of stretches of the coast.

Naturally there is little fertility in pure sand, with only a relatively few of our native plant species consenting to so lean a diet. These few, in course of time, would have covered the sand gradually with their dead leaves and stems, until a depth of accumulated humus offered favorable conditions for the species which inhabit the more fertile soils farther inland. But the pitch pines which have always dominated the barrens are highly inflammable, and it was the Indian's delight, as it still is that of the white hunter to set fire to them. With what little humus accumulates periodically burned away, the barrens remain barren, probably to continue so.

The pines and scrub oaks over the whole area are so stunted that little timber of value is produced, and there is no longer any considerable demand for them as fuel. An extreme of this stunting may be seen in a section called The Plains, ironically perhaps, for it includes the highest elevations in that part of New Jersey, a ridge of what seem to be ancient dunes. Here the forest known to be centuries old averages in some places only waist high, three to four feet, a condition surprisingly like that seen on mountains at timber line, but whereas timber line in this region could be expected at about 7,000 feet, the greatest elevation in The Plains is 149 feet. The exact cause of a timber line so near sea-level is a mystery much debated. Fire and starvation undoubtedly play the chief roles.

Among these miniature pines and oaks grow dwarf shrubs appropriate to the rock garden, though the largest actual rocks in their vicinity are a few small pebbles. That they are nevertheless rock plants, the odd facts abundantly testify.

Most noteworthy, though not the showiest, is the broom crowberry, *Corema Conradi*, much like the true crowberry of the far north, *Empetrum nigrum*, the black berry, however, replaced by a tiny dry fruit, hardly visible. The male plant shows a fluff of brown and purple stamens in early spring, but the chief attraction is the dark green, heath-like foliage of the tufted shrublet, a few inches to a foot, sometimes two feet high.

*Corema Conradi*, though abundant in this one spot, is elsewhere in the barrens and northward along the coast, decidedly a rarity. Imagine the botanist's surprise to find it again plentiful on Gertrude's Nose, a 2,000-foot ridge in the Shawangunks 150 miles to the north, and nowhere between. Gertrude's Nose, not far from Lake Minnewaska, consists of great cliffs of hard white metamorphosed sandstone, on whose very summit, in white sand mixed with a little upland peat, the *Corema* thrives, thrusting its roots into crevices of the stone.



Sand myrtle, *Lecyphyllum buxifolium prostratum*, of the barrens and mountain summits, ideal for the rock garden.

These two situations, the pine barren and the mountain summit, have in common their white sand, apparent drought and thin shade, for the dwarfed pines and scrub oaks are on the mountain too, with *Vaccinium*, *Aronia* and *Amelanchier* in a cover neither high nor dense. And of course both sites have frequent fog. So the *Corema* is a true rock plant, responding well to rock garden conditions.

Another heath-like shrublet of the barrens is *Hudsonia ericoides* inland, with its close relative, *H. tomentosa* nearer the shore. Its grayish green clumps, seldom higher than six inches, are crowned with showy bright yellow flowers in late spring and early summer, but when out of bloom, the dull foliage is not particularly ornamental. It follows the coast into the far north, and there appears unexpectedly on bare mountain summits also, again a plant of the rocks and of the rockless barrens. Unlike the *Corema* it transplants with difficulty. Only very young specimens can be moved with any hope of success.

Common and typical of the barrens is the inch-high creeping shrub *Pyxidantha barbulate*, found nowhere else. In the July-August 1951 Bulletin, this gem of the sands was treated at such length, with suggestions for overcoming the difficulty of transplanting it to the rock garden, a method which could be used also for *Hudsonia* and other plants, that I will not elaborate further. Although it does not follow the *Corema* and *Hudsonia* to our mountain summits, its only near relative, *Diapensia lapponica*, is arctic and alpine, seldom venturing below timber line in nearby latitudes, and too utterly temperamental for our rockeries.

The bearberry, *Arctostaphylos Uva-ursi*, is a third example of rockless barren and rocky summit distribution. Carpeting large areas between the pines with its black-green foliage, under which the pearly flowers and dark red berries are mostly concealed, it appears again on our mountains and in the north, an excellent, though aggressive ground cover for sterile soils. Difficult to establish, it makes up for its stubbornness by growing eventually with too much vigor, and is better for an unused bank than for the rock garden.

*Leiophyllum (Dendrium) buxifolium*, the sand myrtle, deserves special tribute for its adaptability in any light, acid soil. But in the barrens its stems may straggle to a height of two feet or more, retaining too few of the tiny, boxwood-like leaves. So let us look for it in the mountains. The form best fitted for rock gardening comes from the bare mountain summits of the Carolinas, where, as var. *Hugerii* (known in horticulture as var. *prostratum*), it grows dwarf and compact. However there are dwarf forms in the barrens too, overlooked by collectors who sell plants by the inch, and because the color of the abundant flowers varies from white to shades of pink, the best should be searched for. Cuttings root rather easily.

Everywhere the dry sands are ornamented in early summer with profusely flowering tufts of *Arenaria caroliniana*, a pretty thing, but not the best of the sandworts for cultivation. I was amused to see it compete in a damp lakeside sand-garden, with *A. groenlandica* from Sams Point, highest summit of the Shawangunks, both spreading as weeds in a condition apparently not specially well suited to either.

Grass-like tufts of evergreen, grayish, wiry leaves rise in foot-high fountains here and there among the sheep laurels. So unusual a plant suggests that a surprise may come at blooming time, and a surprise it is, a stalk up to a yard or so high, not unlike a miniature *Yucca*, with numerous small flowers clustered in a 6-inch head the shape of an inverted top. This is the turkey's beard, *Xerophyllum asphodeloides*.

In the driest and sandiest places will be found occasional colonies of the prickly pear, *Opuntia humifusa*, with its forbidding but relatively harmless spines and the many little barbed bristles that look so innocent but can play havoc with a tender skin. Its linked green pancakes sprawling over the parched banks, give little hint of the large and glorious yellow flowers that sit flat upon them in early summer. Found also on our rocky hilltops and the ledges of cliffs, this cactus suits the rock garden well, and of all native plants is perhaps the easiest to establish.

Driving through the pines whose sparse needles cast only half a shadow, a palisade of deep green looms ahead, the white cedars standing so close together you can scarcely walk between them. In fact you do not walk there: you must wade. For the barrens are intersected by bogs and winding, sluggish streams covering areas almost as wide as the sands, with a vegetation even more unique and fascinating. Here are plants for the bog garden only.

The transition from dry to wet may come along a sharp line of some disintegrated dune centuries old, or more often there is an intermediate grassy region where the moisture lies a few inches beneath the sandy surface. In fact most of the barrens are not really dry at all, but full of moisture at a depth of a couple of feet, easily accessible to plant roots. Water they offer in plenty, water with little nutriment. The lush thicket-growth in the bogs testifies to the fertility of fallen leaves which soak and rot there instead of being burned as they are on the sands.

The bog and ditch thicket, often almost impenetrable, consists of familiar and unfamiliar shrubs, some of which spread far into the barrens. The mountain laurel, abundant in woods not actually wet, intermingles with the sheep laurel, *Kalmia angustifolia*, which endures more water here, as it does over millions of acres in our mountains. Its smaller red flower clusters make less of a show than *K. latifolia* because they nod beneath the foliage crown, but growing commonly only two or three feet high, it deserves at least a little place in the garden, which it is seldom accorded.

Occasionally appreciated because its lily-of-the-valley racemes open in March and stay in flower through many frosts, the water-edge evergreen (or ever-brown) *Chamaedaphne calyculata* makes dense stands a couple of feet high. No one seems to have wondered whether among the millions of plants of it, there is not one a little dwarfer, with greener leaves and larger flowers, suited to general cultivation. If only the flowers of *Lyonia mariana* (It has been pilfered from the genus *Andromeda*) which has very sparse foliage, could be superimposed on *Chamaedaphne*, what a marvelous plant we should have! These bells of purest white or tinged with rose are giant blueberry flowers nodding in clusters from yard-high stalks, followed by intricate brown-and-white capsules which a jeweler might have been proud to design. In spite of the fewness of its deciduous leaves and its stiff stems, the staggerbush is worth growing, if only for the winter-arrangement value of the capsules. But the dazzling flowers would grace any low shrub border. Here again, a more graceful and leafier individual would reward some patient searcher. All these shrubs are ericaceous, requiring a peaty soil and a mulch. He would be a rash gardener who would attempt anything from the pine barrens in any but a strongly acid soil.

Everywhere in the swamp thickets glisten the dark green domes of the inkberry, *Ilex glabra*, with small white flowers and black berries close to the twig. Some individuals hold more winter leaves than others, some are more inclined to sucker, but I have seen selected specimens in cultivation with almost

the ornamental value of boxwood, and certainly superior hardiness. It is a black-berried holly.

The Christmas holly is rare in the area of the barrens, though surrounding parts of New Jersey now offer an abundance of saplings springing up in the swamps where commercial greens-cutters thought they had eradicated it. Evidently it prefers less acid conditions.

Among the innumerable sweet pepperbushes with their upright spikes of white flowers, are a few dwarf ones with spikes which nod. These are not sweet pepperbushes at all but sweet-spires or Virginia willow, rather rare so far northward, and in spite of the outward resemblance, not even closely related, belonging far away in the saxifrage family under the name *Itea virginica*.

Conspicuous everywhere in the wet lands is *Magnolia virginiana*, holding its shiny, tropical-looking leaves well into the winter, and all summer offering up its pale gold fragrant chalice one by one. Unlike the southern, fully ever-green Magnolia, this swamp magnolia proves entirely hardy as a shrub or suckery tree considerably north of New York City.

Sometimes the dark blotch in the distant bog is not Magnolia but *Smilax laurifolia* draping the treetops with its heavy, black-green foliage popular at the florist's, a rare vine in the north.

It would be futile to try to list all the plants of these variously damp and sopping wet places. Only a few of the rarest and the most ornamental subjects deserve mention here. One of the most noteworthy for damp or average soil is the pine barren gentian, now *Gentiana autumnalis*, something untoward having happened to the old name *G. Porphyrio*. This is one of the most ornamental of gentians, rather easily grown from seed, and there is a splendid white variety, truly rare, as even the blue one is coming to be, with collectors always on its trail. It is not hard to transplant from the wild, but garden patriots who do not wish to exterminate our wildflowers or hire someone else to do it for them, will find an agreeable surprise in the Seed Exchange.

There too they will find the seeds of a strange, brown-flowered Pedicularis, *Schwalbea americana*, a little known and decidedly local inhabitant of the grassy, dampish places, growing with the colic root, *Aletris farinosa*, whose little spires look confusingly like the later-flowering lady's tresses, the white orchid we find in all our swamps.

In and out of the bogs and ditches are seen the charming bog orchids, *Calopogon pulchellus*, our grass pink, so ornamental that it seems inappropriate so much should be blooming everywhere, also the more quaint and less showy *Pogonia ophioglossoides*, and the white fringed orchis, *Habenaria blephariglottis*. For those who know the secret hideouts, *Arethusa bulbosa* is in these bogs too. All the bog orchids will succeed in a well made Sphagnum bog, as described in the Bulletin for September-October, 1951. They lurk also in the more remote of our mountain bogs.

The swamp pink, *Helonias bullata*, chooses the shadier recesses in wet Sphagnum, under the white cedars and the Magnolias. Its dense heads of shimmering purplish pink thrust up a foot or more from the lax crown of ever-green leaves. Rather desirable, it is also one of the rarer species, though spreading southward along the coast and in the bogs of the southern mountains.

Rarer still is *Narthecium asphodeloides*, the bog asphodel, a liliaceous plant suggesting a small yellow loosestrife, known only in a few acres of sunny mud, its narrow spikes a foot or so high from grass-like leaf rosettes. Of about the same dimensions or a little smaller is the related *Tofieldia racemosa*, a whitish-flowered bog plant more common southward. Both would make attractive sub-



The bog orchids *Pogonia ophioglossoides* and  
*Calopogon pulchellus* in a bog garden.

jects for the bog garden if they could be made to grow and thrive, but since they will not, they should be left unmolested.

One of the most conspicuous, though small in size, is the yellow milkwort, *Polygala lutea*, blazing orange yellow, clover-like heads on stiff stalks. This will grow and seed itself freely in any Sphagnum bog, blooming with all the liberality of an annual, though it seems to be biennial, with attractive little rosettes of smooth leaves the first season.

No account of the bogs could skip the pitcher plants, *Sarracenia purpurea*, with their water-filled leaves set to trap unwary insects, while red flags wave above from the drum-like flowers. More curious than beautiful, they grow well in any Sphagnum. So too will the little sundews, spreading their sticky fingers with similar intent, but flowering prettily like a tiny white forget-me-not. This is *Drosera rotundifolia*, which, if the leaves happen to be a little out of round, becomes *D. intermedia*. Very different, larger and much more ornamental is *D. filiformis*, rush-like leaves bristly throughout their length with purplish, glistening glands on which dead insects dangle, the showy flowers purplish or pink.

Nor can we forget the cranberry, *Vaccinium macrocarpon*, cultivated in thousands of acres of prepared bogs, where the more beautiful plants here enumerated may occur as weeds. Not that the flower of the cranberry is to be despised, with its intriguing dark dart of united stamens poised before the curled-back pink corolla as though to strike at some intruder on the moss. The narrow vine it springs from soon outwears its welcome by a headlong speed of growth, forking interminably through and over the choicer things, and pushing its big red blobs of berries into the wrong places.

*Sabatia difformis*, of gentian alliance, used to be *S. lanceolata*, a true bog plant with good white flowers, but the pink *S. stellaris* belongs rather to the salt marshes, where it tints hundreds of acres with soft rose over a long season.

Goldenrods, Asters, Eupatoriums, and other of the larger flowering plants are represented by numerous species peculiar to the barrens and to their bogs. All are described in a fat volume by Witmer Stone, long out of print and a collector's item, but to be found in many botanical libraries.

Two last species, one a fern, rare and confined to the Sphagnum, must close this brief account. First is the curly grass, *Schizaea pusilla*, so small that the eye must be trained to find it, yet botanists spend more time on this particular search than on all the other pine barren rarities. It will not grow for you, and if it would, you would hardly enjoy looking at what seems to be a tiny tuft of spiral-leaved grass, until it thrusts up stalks two or three inches high, surmounted by what looks somewhat like the paw of a mouse.

Finally the climbing fern, *Lygodium palmatum*, twines with its handsome evergreen leaves in a few swampy thickets known to pine barren enthusiasts, whither it was driven by the relentless persecution of its admirers. Once sought out for Christmas decorations, it has vanished from most of its original range, but survives here and on the mountains.

The bog gardener will readily understand what the mud and the varied and beautiful Sphagnums of the barrens hold in store for him, but why it is that rock plants flourish in their rockless wastes remains a much studied mystery.

## PLANT ASSOCIATIONS IN THE ROCK GARDEN

WILL INGWERSEN, ENGLAND

ALL SORTS of people grow all sorts of plants in all sorts of rock gardens. Some are collectors, and care little for artistic arrangement so long as their plants are contented and their collection is sufficiently representative, but the majority of those who find pleasure in growing alpine plants and in making suitable homes for them, find additional joy in achieving pleasing and tasteful combinations of plants, and are always on the lookout for ideas as to what plants to grow together.

I find myself with a foot in each camp. I am undeniably a plant collector, but I also delight in arranging plants in the most pleasing way that is possible in their garden environment. My rarities and botanical curiosities are confined to special areas where they can receive individual attention and worship, and the rest of the garden is planted with a sharp eye to the effect which can be created by the blending of various plants into a harmonious picture.

Many of the most worth-while effects are in the first instance accidental combinations, or self-arranged ones where plants have seeded themselves (and they have a surprisingly frequent knack of placing themselves in singularly suitable positions). Other, carefully planned projects do not come off, or fail for some reason or other to be as attractive as they were in one's imagination. Timing too, is not always a staple factor and is affected by seasonal and climatic variations. However, I have been lucky enough to create some very pleasing associations, and have seen a number of others, and a few notes may suggest experiments.

I possess a hot and dry bank of stony soil which has always been a problem

to fill decoratively, especially in the late summer, when the *Cistuses* and *Helianthemums* which like the arid conditions have finished their display. A few years ago I planted at one end of this bank, amongst some outcropping limestone boulders, a few plants of the silver-gray-leaved *Zauschneria microphylla* whose scarlet flowers appear in abundance during August and September. Along with them I placed a dozen roots of *Sedum maximum atropurpureum*, a lusty stonecrop which has stems and leaves of deep, polished mahogany color. The flowers are carried at the same time as those of the *Zauschneria* and are flat umbels of brown-bronze buds, shimmering with pink as the small flowers open. This proved a singularly happy association and has caused a lot of admiration each year.

As I consider some of the plants I have seen growing effectively together I realize that some of them may not be easily available in the U.S.A., but this is less important in this case because it is not entirely necessary to use just the same plants; often enough a similar effect can be obtained by using plants of a like habit and flower color, which may be obtainable. This applies to two dainty little cool-soil plants which are associating very charmingly in my garden now. One is the tiny, creeping, soft blue flowered *Wahlenbergia* (or *Campanula*) *hederacea*, and the other is the equally prostrate Bog Pimpernel, *Anagallis tenella*, with starry, rich pink flowers. Both these plants are rare British natives, but the forms I grow are selected varieties with larger, more richly colored flowers than are usually seen on the plants in the wild. The same delightful effect that I have enjoyed this late summer can be achieved by using any two creeping plants with flowers of similar colors. *Houstonia caerulea* might well be one for a cool moist spot.

The Asiatic gentians, which ramp in our lime-free soil, form wide carpets which become sheets of deep blue in the late summer and autumn. I always thought the carpets of color delightful, but apt to be slightly monotonous, until I thought of planting amongst them a few dwarf plants with leaves which took on a brilliant color at the time of year when the gentians were blossoming. *Cornus canadensis* is one, and several of the dwarf *Vacciniums* and *Gaultherias*. This proved a very happy combination and the rich leaf color of the little shrubs set off the blue of the gentian trumpets in an admirable and very pleasing manner.

With a few notable exceptions, of which *Zauschneria* is an example, it is wise to choose the softer colors for mingling together. I tried for a long time to find a pleasing companion for the brilliant cerise *Geranium subcaulescens*, but everything I put with it clashed hopelessly, and I have come to the conclusion that this is a plant which must stand alone. I did once see a barbaric mixture of *Calirrhoe involucrata*, its screaming magenta cups tossed amongst an equally brilliant hybrid *Penstemon*. This came off with a bang, and, although it offended some with aesthetic tastes in color, it was much appreciated by those with a stomach for strong meat. I have also seen the *Calirrhoe* most effectively used hanging down over a wall of old, warm red brick.

Our best teacher for good blendings can be nature, who is seldom guilty of faulty color associations. If we keep our eyes open as we travel about it is possible to pick up many a good idea for future use in the garden. I shall not easily forget, although I have never been able to remake the same combination, seeing in the Maritime Alps a great gray boulder covered with *Primula marginata* in full flower, with tall stems of *Lilium pomponium* displaying its brilliant scarlet flowers against the cool lavender of the *Primulas*.



## THE SEED EXCHANGE

With this issue goes the longest Seed List in our history. The very magnitude brings new problems, and members must do their part to ease the burden which falls on the Director. First give the list your immediate attention, and mail your request at the earliest possible date. It is necessary to set a deadline this year for requests as well as for seeds received. Get yours in before the last day of January, or it will not be considered in the main distribution, and only by luck will you be able to get what you ask for if you mail later. Exceptions will be made in the case of members who live at a great distance.

Now too, while you are thinking about it, is the time to write out your Wish List for 1954. What seeds not on the Seed List would you have liked to see there? Nobody will know you want them unless you ask for them. If you asked last year, and they were not offered, ask again. Even if they are listed, it will do no harm to ask again for seeds you particularly desire, because the quantity may be small or the quality poor, and these things you will not know until later.

A Wish List will be published in the April number, perhaps an additional one in July. For April, your list should reach the editor before March first.

## PLANT NOTES FROM MAINE

GRACE F. BABB, PORTLAND, MAINE

A FEW NOTES concerning the seeds contributed to the Exchange may be of interest if the plants are unfamiliar. Taken alphabetically, the first is *Actaea rubra*, the red baneberry, not a rock plant, but a favorite native woodland plant, easy to grow in light shade and a reasonably moist leafmold soil. There are handsome clusters of feathery white flowers in May, and in midsummer the bright red berries which often persist into the fall unless discovered by the birds. The sturdy cut-leaved foliage clumps are always attractive.

*Alyssum corymbosum* came from a garden friend in Pennsylvania, and grew quickly and easily from seed. It blooms later than the common *A. saxatile*, with similar soft gray foliage, and profuse 15-inch sprays of bright gold which are very long-lasting. It seems perfectly hardy and perennial, and has made itself at home in a sunny, sandy location.

*Anemone pulsatilla rubra*, the little red pasque flower, is an exasperating challenge. My original plant was grown from seed many years ago, but never yet have I managed to grow another mature plant from its freely-ripened seeds. Seedlings produced from fresh-sown seed in mid-summer probably need special over-winter protection in my climate. This blooms much later than the purple pasque, and the dark red flowers like little tulips are among my favorites, although some gardeners do not care for them. The season is long with buds continuing to appear after the earliest flowers have turned to seed. The feathery gray-green foliage is always an asset from spring to fall.

*Aquilegia calcarata* came true from seed from a friend's garden, and I hope it will continue to do so, but I can guarantee nothing. It is an enchanting species and deserves to be much better known. This is the Chinese species, of course, and not the variety of *A. vulgaris* described by Mr. Ginns in the October Bulletin. The foliage clump is very similar to that of the eastern red columbine, dark olive green with red and purple tints, especially in early spring and late

fall. It stands about a foot tall with countless flower stems held just above in a shower of dancing, flat-capped, spurless flowers. These are only half-an-inch in length and width, said to be the smallest columbine in cultivation, and the color is a warm red-brown—call it chocolate or maroon, perhaps, but neither does it justice. My plants seem happy on a northwest slope with hot afternoon sun but a cool rocky root-run beneath. This may prove to be rather short-lived like so many other columbines, but so far my plants appear to be perfectly satisfied with life. A nice amount of seed was collected, and I suspect there are quite a few self-sown seedlings, which makes me wonder why this is so rare and little known.

*Corydalis montana* is a charming imp from the western mountains, said to be very similar to the better-known *C. aurea*, but with finer-cut and more glaucous foliage. I believe it makes the loveliest foliage clump of anything I am growing. The leaves are of palest green with a very silvery effect in hot dry weather, and minutely and delicately cut. The tiny bright gold flowers appear huddled in the foliage rosettes in early May, with the ever-lengthening stems continuing to produce buds and more and more flowers well into the summer if conditions are pleasing. Strong plants may have flower stems many inches in length by summer, with already ripened seeds nearest the rosettes. The plants may be either annual or biennial, like our eastern *Corydalis sempervirens*. Early spring-sown seeds will usually produce flowering plants the same season, while self-sown seedlings appear anytime during late summer and fall and will live over winter as a rule. The youngest and tiniest of these may be only an inch or so in diameter, while the largest clump I have this fall is well over eight inches across. The seeds are tiny, jet-black and shining. Mine came originally from one of Dr. Worth's collecting trips, and have kept themselves going for at least ten years, although once by the slim margin of a single seedling! Its self-chosen spots are almost invariably in the partial shelter of rocks or dwarf shrubby plants, not in full sun.

*Gillenia trifoliata*, called bowman's-root, or Indian physic, is a fine background plant with the general appearance of a shrub although actually it dies back below ground like any perennial. It is attractive all season, perfectly hardy, and well behaved. The first growth, appearing in late spring, is bright red in color, and the red continues all summer in the upper leaf and flower stems, while the lower branches mature to brown. The June flowers are very like shadblow, with five slender white petals held in bright calyx-cups, the many stamens also in red. Clumps stand about three feet tall, and the many graceful sprays of flowers come at a welcome time, just after the first spring blooms have gone by, in mid-to-late June. A few good companions, taken at random from my notes, include the tall purple and white Polemoniums, Geranium Blue Beauty, hybrid columbines and Heucheras, all of which will enjoy about the same conditions of partial shade or sun with ample moisture and fairly rich soil. Before dropping in the fall, the leaves turn delicious shades of yellow, bronze and purple in one last lovely gesture.

*Hyssopus officinalis* is a "hardy perennial subshrub", to quote Hortus, which is quite dependably evergreen here. The tops of the branches are usually killed back to some extent, depending on the severity of the winter and the amount of snow cover. The fine dark green leaves persist on several inches of the strong woody stems, and the dead wood is easily pruned in spring. New growth shoots up quickly to form a much-branched, leafy clump about a foot high, useful for edging, or for specimen plants at the end of a border, or in the rock garden. In July the clump is completely covered with six-inch spikes of tiny dark blue

flowers, with conspicuous feathery stamens. These are very long-lasting, and new spikes will often continue to appear for much of the summer if the earliest are cut back. There is also a pretty pale pink variety which I have, and white and red which are on my "Wish List." The leaves have a strong aromatic fragrance when crushed, and hyssop is one of the commonly grown old-time herbs. It grows easily from seed (mine came originally in an herb mixture) and also from cuttings or divisions.

*Potentilla recta* var. *Warrensi* may be too robust a plant for a rock garden, and certainly does not belong among true alpiners, but may be useful for its good habit of growth and midsummer blooms. It is a named variety of the species *P. recta*, but apparently much better behaved in cultivation. The foliage clump is about a foot tall in a compact rounded "bush" of dark gray-green leaves which are cut into five-to-seven toothed leaflets, spread out finger-fashion. In July it completely covers itself with large showy golden flowers, much handsomer than the paler yellow ones of *recta*. In several years here, I have seen no sign of the self-sown seedlings which forced me to banish *recta*, much as I enjoyed its beauty, otherwise.

"Freckles" violet is immensely popular with gardeners on sight, and most cannot resist taking it home although warned that it will spread like so many others, by countless cleistogamous pods ripened in late fall and unnoticed at the time. It is a beautiful and unusual violet with large flowers of white, but so thickly spattered with "freckles" of lavender that they appear colored in effect. A few seedlings the past spring appeared to be much darker with a purple background spotted in lighter violet,—interesting but not quite so pretty as the original. This is supposed to be a natural hybrid of *V. cucullata*, I believe, but I have no accurate information. The foliage is quite distinctive and easily recognized even out of bloom for its dark blue-green color and noticeable veins in dull yellow, especially near the centers.

## LETTERS TO THE EDITOR

In the July number of the Bulletin, a list of seeds was given which members were eager to secure. In examining this list, I realized that there was a goodly number that members living in the Central States could hardly hope to raise, not only because of our hot summers, but also because of our variable winters. A few of those mentioned might possibly be kept alive over the winter in a cold frame. *Androsace lanuginosa*, for example, which is a delightful plant that on two occasions I managed to hold over the summer, perished during a cold, damp winter.

*Campanula hercegovina* I managed to keep alive for one year in a small alpine house, and at least had the satisfaction of seeing it bloom. Many years ago this plant received an Award of Merit from the Royal Horticultural Society, and in England it is said not to be difficult to grow: but if anyone in this section of the country has managed to hold it outdoors for two successive years, I should be very surprised. *Campanula Morettiana*, a very rare plant growing on high cliffs in the Tyrol, is even more difficult to raise. On three different occasions I managed to start a few seedlings, only to have them perish during the summer. *Campanula Piperi* might be grown in some of the cooler sections of the country, but here in the Ohio Valley I have never been able to keep it alive any length of time.



*Globularia trichosantha*, one of the larger species of a useful rock garden genus.

This spring I had a nice batch of *Gentiana Farreri*. There were possibly thirty plants, of which at the end of the summer, I had just three left, one placed in a deep cold frame that was shaded with slats, and two in the alpine house growing in pure Sphagnum. In fact I know only of three or four low-growing gentians that are at all reliably hardy here—*G. acaulis*, *Lagodechiana*, *septemfida*, *Purdomi* and *hascombensis*. To this number I might add *G. verna*, which I saw growing in this vicinity. The owner had planted it near a little brook, which no doubt kept the roots moist all summer.

*Phlox adsurgens* is another plant that I have been unable to hold, probably due in great part to the fact that it seems to resent my limestone soil. With Ramondas I have had no luck, which may be partly due to my inability to place them where they could have a reasonably cool, moist root-run throughout the summer. Incidentally, if any members intend to try them, I suggest that they give them a northern exposure.

If we turn to the reverse side of the picture, it might be worth mentioning a few attractive plants of which members desire seed, and that are not seen very frequently in this section of the country. *Eriogonum ovalifolium*, with plenty of rock chips on the surface, has lived for many years, and has formed a mat fully two feet in diameter. Possibly it should not be planted in the rock garden until the roots are well developed. The Aquilegias, with the exception of *A. Jonesii*, all thrive here, although they are not long lived, but for that matter neither are the taller ones we place in the border.

The Globularias also are reasonably hardy, although I like to put two or three in the cold frame over the winter. *Malvastrum coccineum* in a warm, sunny location is also a good plant which with me seems to have the habit of never coming up for two successive years in exactly the same place. *Potentilla nevadensis* with its yellow flowers is also an attractive plant that has remained with me for the last three years. Unfortunately I neglected to save any seeds this summer, but shall endeavor to secure some for next year's Seed List. However I could spare two or three plants which I should be glad to send to anyone particularly desirous of raising it.

ROBERT M. SENIOR



*Malvastrum coccineum*, the prairie mallow, a brick-red westerner up to about ten inches high.

## INDEX TO THE BULLETIN

In place of the two-year index which the Bulletin has been accustomed to issue after the completion of every even-numbered volume, there will be a ten-year index, not going into such minute detail as usual, nor listing every mention of a plant, but including all the important features of the Bulletin from its inception in 1943. The greater labor involved in compilation has necessitated a little delay in issuing this inclusive index. It may be expected with the April number.

## SEEDS OF ALPINE PLANTS

G. H. BERRY, ENGLAND

(Reprinted by permission from *Gardening Illustrated*, September, 1952. The intimate information and suggestive speculations are so stimulating that no one who sows seed should fail to read them.)

THIS IS NOT a learned article but just the ideas, speculations and observations of a very ordinary amateur who has been much interested in the raising of seedlings, mostly those of what are usually called alpine plants.

A seed is formed by the fusion of one grain of pollen with one ovule in the seed vessel. The pollen grain falls on and adheres to the stigma of a flower. It germinates and grows down the style and fertilises one ovule and no more. This process may take one or two days or with a few plants may take several weeks or even longer—six months with *Colchicum*! In fact, the processes of pollination and fertilisation are so varied and peculiar to individual species of plants that fertilisation of the ovule by "foreign" pollen is almost impossible, except between closely allied species. Even then it is a comparatively rare event.

For instance hybrids (inter-specific crosses) between *Primula minima* and *P. hirsuta* may very occasionally be found on the alps of Europe where both of these primulas grow near to one another. Under these conditions there would seem to be every opportunity for the pollen of one species to be carried by insects, or blown by the wind, on to the stigma of another species and so produce an abundance of hybrids. In fact, even if the pollen is so distributed it is only effective in fertilising the ovules of another species on rare occasions.

Much the same thing occurs, or rather does not occur, if we grow near to one another, in our frames or alpine house, closely allied species—*Primula Allionii* with other primulas, the Aretian androsaces or the Himalayan gentians.

Of the latter, *GG. Farreri*, *ornata* and *Veitchiorum* very rarely set any seed at all if left to themselves, but if pollen is distributed with a small brush of sable hair, then there will be an abundance of seed, either true species or hybrids.

### THE CONTROL OF SEED QUANTITIES

One grain of pollen is capable of fertilising one ovule and no more. It is well to remember that fact. It explains why we so often get but few seeds when we are expecting a large number. The number of seeds will depend on (1) the number of ovules per flower and (2) the number of ovules that have been fertilised.

The flower of a peach tree can only give us one seed. *Mertensia* are limited to four per flower. *Silene* and *lewisia* usually set but few seeds per pod, when one would expect a large number from the size of the spherical pods. *Gentiana verna*, *Phyteuma comosum* and *Companula morettiana* will set a vast number, indeed, the rule seems to be that the smaller the seed the greater the number. One flower of *Gentiana verna* is capable of setting several hundred seeds (I have counted 425 from one seed pod). *G. Farreri* can probably set as many but seldom does. When some of the ovules of a flower of *G. Farreri* have been fertilised, seed will be formed, and as the corolla of the flower fades and shrivels, the stalk of the seed pod will rapidly elongate and the pod will be pushed out above the shrivelled flower.

On examining such a seed pod, you will usually find a few seeds, perhaps six, eight or 10, and the remainder of the contents of such a pod is a little brown dust, which is the dried up ovules which have not been fertilised.

A seed is, in fact, a complete living plant, having root, stem and leaves and a store of food material already formed within it. The seed will continue to live and awaits the coming Event—the favourable conditions and, with most of our alpine plants, the time of year when it can germinate.

If the seed is from an annual, biennial or monocarpic plant, the seed will germinate at any time of the year, if given warmth and moisture; but the seeds of the perennials which we call alpine plants will refuse to germinate under any conditions until a certain time of the year, usually about March.

Further, if these perennial seeds have not been sown soon after they were gathered, they will often refuse to germinate in the following spring and will wait for another 12 months.

That is the general rule; doubtless there are many exceptions, grass seed, for instance, and even with my limited experience I have come across a few. Thus the seed of *Mertensia rivularis japonica*, sown on August 5, 1950, germinated three seeds in the early autumn, but all the others waited until February 17, 1951.

Seeds of *Gentiana Kurroo* will wait until July of the year following before it will germinate. That is the only example of an alpine plant I have found that germinates its seeds at midsummer.

*Campanula morettiana* seed will always wait until the second year after sowing. That is so interesting that I give the actual dates:

Sown	Germinated
October 14, 1946	April 27, 1948
October 17, 1949	April 8, 1951
August 29, 1950	April 2, 1952
November 22, 1950	April 2, 1952

Most of the plants we grow as alpine are perennial and it is advisable to sow the seed in the early autumn, indeed, I usually sow them as soon after gathering as possible, but germination does not take place until about March of the following year. A notable exception is the seed of the gentians of the *Frigida* section: *GG. Farreri*, *ornata*, *Veitchiorum* and *sino-ornata*, and their hybrids. These seeds will germinate in about six weeks, and it is not easy to keep the young plants through the winter without losing them.

Another very common thing is what I call batch germination. Seed of *Gentiana affinis* was sown in a pan and placed in a greenhouse, having an electric heater controlled by a thermostat, set to keep the minimum temperature at 40 deg. F. It germinated in November and all the seedlings "damped off." Another batch of seedlings appeared in January and they also were attacked by mould and failed, but a third batch came up in April and were grown on successfully. I have known the same thing to occur with *Gentiana verna*, while with *Phyteuma comosum* the delay between first and second batches may be 12 months.

The delay in the germination of seed may well be due to the degree of permeability of the seed coat to water, but that does not explain the appearance of seedlings in definite batches. If the permeability of the seed coat to water were the cause of delay, the seedlings would be expected to germinate in a regular sequence; first a few, then a gradually increasing number, and a steady falling off of the number towards the end of the period.

If we may indulge in speculation, there may well be an unknown factor at work and this may be some living organism, like the fungus associated with orchids and essential for their well-being. Search for any form of mycorrhiza

on the seeds or roots of gentians has ended in failure, so if there is an unknown factor it is something microscopic or even ultra-microscopic.

When a seed germinates the root or radicle is pushed downwards into the soil. If the soil is resistant—hard or closely packed—the root or radicle is unable to make much progress downwards and, if the seed has little covering, the seed will be pushed upwards, the seedling will become top heavy and fall over, the tip of the root coming out of the soil.

#### SOME COVERING IS NECESSARY

You have probably seen many such seedlings lying on the soil surface. If noticed soon enough, they may be saved by making a small hole with a match and coaxing the seedling into it. It would therefore seem that some covering above the seed is advisable and yet experience tells me that, with the small seed of our alpine plants, it is all too easy to make this covering too deep, with the result that no seed will germinate.

I have often given seed of *Gentiana verna* to friends and have been told it failed to germinate—probably because covered too deep. One good friend, having lodged the usual complaint, was asked how deep he put the seed in. The answer was, "Oh, about half-way down the pot!"

A little experiment of mine may be worth recording. Seed of *Gentiana Farorna* was sown in four pots. Conditions were identical except that the seed in one pot was only lightly sprinkled with a gritty mixture, just sufficient to cover the seed. In the second pot the covering was  $\frac{1}{4}$  in., in the third  $\frac{1}{2}$  in., and in the fourth  $\frac{3}{4}$  in. The seed in the first pot germinated very well, but in the other three pots not a seedling came through the soil.

The failure of seeds to germinate when they have been buried too deeply has been stated to be due to an excess of carbon-dioxide in the soil atmosphere or to the weight of the soil on the seed. Neither explanation seems very satisfactory, for continued rain would seem likely to wash the soil clear of any excess of carbon-dioxide, and the weight of  $\frac{1}{4}$  in. of soil above the seed of *Gentiana Farorna* hardly seems adequate to prevent germination.

The soil in a pan does tend to pack and cake, particularly near the surface, even if the pans are soaked from time to time by standing them in water in a bowl. To give the radicle an easier path downwards, it is advisable to have plenty of fibre in the soil. Loam varies very much in this respect and, even if there seems to be a fair quantity of fibrous material in the load, the addition of some peat will make the soil mixture more spongy and not so liable to cake. Leaf mould is equally good for keeping the soil open and spongy, but I find that mould forms on any small particles on or near the surface and probably considerably increases the risk of damping off.

Every plant has the ability, within limits, of making a balance between the roots and the aerial growth. In a poor soil—that is, having little available food material—the roots will be numerous and make rapid growth in an effort to collect what little food (dissolved salts) is available. On the other hand, in a rich mixture—that is, a soil containing plenty of well-rotted leaf mould, for instance—the roots will get all the food they require on the doorstep, so to speak, and then they will be few and short.

Most books recommend a poor soil for seed-sowing: a fibrous loam, some peat and sand, and little else. Doubtless, they are right. The roots of the seeds in such a mixture, after the seed has germinated, will make rapid growth and will be long enough and numerous enough to make transference to a small pot advisable at an earlier date than for seedlings grown in a richer mixture. These



seedlings, having plenty of roots, will also be more likely to recover from any damage to the roots when transplanting; for, even with every care, some broken roots seem unavoidable.

Personally, I like to mix a little leaf mould with the soil at the bottom inch or so before putting the rest of the mixture in the pan, because I fancy the extra available food for the roots, when they get down to it, is an advantage: but I am not going to say that I have any real proof that this does have a marked effect.

## CAPITAL TREASON

On page 65 of the October Bulletin, Dr. Wherry wrote in a footnote, "The current rules of botanical nomenclature call for decapitalization . . ." Alert observers may have noted that except for Dr. Wherry's articles, the call for decapitalization went unheeded throughout that issue of the Bulletin and all others since the present editor took office. Under these circumstances an explanation seems in order.

The call for decapitalization is a recommendation, not an order. It took several decades for proponents to force even the recommendation upon an obviously unwilling botanical world. We may expect many or most of our leading botanists to reject the recommendation, but in any case your one-eyed editor pleads special privilege to spare the remaining eye, chronically exhausted from checking semi-familiar names in reference books, all capitalized.

Few botanists can remember more than a very few thousand botanical names in exact form. Other thousands hover on the fringe of memory, to be looked up when necessary. Capitalization is an aid to this editor's memory, lessening the necessity of such perpetual looking up. *Narcissus bulbocodium* looks like a neuter adjective following a masculine noun, and would require a hunt through at least one index to make sure it was not a mis-spelling. *Narcissus Bulbocodium* explains the seeming lapse in grammar, no reference needed. And so it is with hundreds of other names.

So far as the Bulletin is concerned, any member who, like Dr. Wherry, will send in a manuscript which needs no editing, may have it printed with the names decapitalized if he so desires. Unless decapitalization is requested, the names will be capitalized as always.

Should some follower of Theodore Roosevelt send in a good article in simplified spelling, and insist that it be printed that way, we might even be willing to put our readers to that torture and risk being shot by the printer. Manuscripts are so hard to come by that we make concessions, but please spare as much as possible the editor's 63-year-old eye. Even the glass one is a dozen years old.

Although the advocates of decapitalization have won a political victory in securing their recommendation, it must not be assumed that the matter is closed. Through the kindness of Bernard Harkness, who hunted out the material for us, here is the opinion of an able and renowned botanist, a fellow member of our Society, L. H. Bailey. From *Gentes Herbarum* Vol. VII, Fasc. II, a few of the most significant paragraphs follow:

"Species-names fall mostly into three categories: 1. adjectives that are written in agreement of gender with the noun or generic name; 2. nouns in the genitive, conforming with their own history and structure; 3. vernacular nouns that are not declined and possess no classical genitive, therefore not in agreement with anything.



*Juniperus communis* var. *montana* on a cut stump of *Abies lasiocarpa*  
at 5,000 feet in the central Cascade Mountains, Washington.

Photo. by B. O. Mulligan

"The adjectives are written in lower-case, unless they represent the names of persons, as in *Johnsonianus*, *Hookeriana*, in which case they should follow the practice in Latin and other language and in which decapitalization would offend good literary taste and should also offend the person who is commemorated. It is no compliment to a man to decapitalize him . . .

"Nouns in the genitive, as *Johnsonii* and *Hookerae*, should be accorded customary literary usage and they should also conform to good manners; they carry a capital initial.

"Vernacular words . . . are either barbaric names, or old generic nouns without customary placement; they are exceptions to ordinary rules and may not be declinable, yet they have a meaning in themselves or at least historic significance and should not be minimized. They are employed in apposition to the generic noun and take capital initial. They are capitalized to signify their etymology and not merely (as often stated) to follow tradition.

"It is common assumption that species-names should be decapitalized as a concession to the faulty memory of those who use them, or to conform to a fetish of uniformity. These are not valid reasons . . .

"A writer or editor in taxonomy should know his subject well enough to write it intelligently and with regard to the niceties of language. That is his job . . .

"If an author must save himself trouble then he should go the limit and make all terminations uniform, for the ends of words are more troublesome than the capital initial: he should not be expected to bother his memory with *Areca alba* and *Dictyosperma album*, *Acrocomia aculeata* and *Astrocaryum aculeatum* and *Desmoncus aculeatus*. It may be said that these terminations are part of the spelling of the words and cannot be changed, but so are capital initials part of the spelling of proper names: or if it is stated that to change them would violate agreements in gender so may it be stated that the placing of vernacular names in lower-case assigns them to an adjective status with no agreement whatever . . .

"It is important and should be obligatory not to obscure the agreement and hide the meanings. There is no agreement and no sense in *Polygonum convolvulus*, *Daphne mezereum*, *Convolvulus soldanella*, *Acacia julibrissin*, *Jatropha manihot*, *Brassica pe-tasai*, *Phaseolus mungo*, *Psoralea onobrychis*, *Zea mays*.

"Consider *Pyrus Malus*. The noun *malus* means the apple-tree. Linnaeus took over the name from Bauhin, with a capital. The adjective *malus* means 'evil' or 'injurious.' *Rubus malus* has meaning, but there is no significance or sense in *Pyrus malus*. Intention in the *Pyrus* case was to record a fertile history, in the *rubus* case to designate a scratchy plant."

## DRUG PLANTS

Protests against the use of "false" in common names of plants, and the index in Gray's Manual lists no less than 32 instances, beginning with false acacia, call to mind the passing of an era. Botany in its early stages served chiefly to instruct herb gatherers how to distinguish between certain drug plants and other species which might be mistaken for them. Herb gathering may have become a nearly extinct profession locally in 1953, but in 1933 it certainly was still a fairly important one here, while even today much of the world still clings to it.

Before the invention of aspirin and other synthetics, people had to have their drugs, thousands of barrels of them, and originally most of these were extracted directly from plants, wild or cultivated. Wholesale druggists paid so much a pound for each of a long list of wild plants in demand for international trade. Who gathered the American ones?

In the "good old days" men came to poverty by bankruptcy, bank failure or illness, and it really was poverty. Welfare agencies are of recent growth. Government relief payments were unheard of before 1933. There was of course the institution of the poor house, a last resort to ward off death by starvation. But those who wished to keep their freedom usually became beggars and tramps.

But there were ways of scraping together enough money to buy food, and one of these was the collecting of drug plants. The average American fifty years ago had worked on farms in the summer and spent at least a winter or two in a lumber camp, accumulating inevitably some general knowledge of woodcraft and plant life. It was not difficult for him to learn to recognize drug plants. A day's walking through the hills would yield him a bagful of something he could convert into a little cash next morning.

To him if he was collecting the roots of Solomon's seal, it was important to know that false Solomon's seal had no value, though to an unobservant eye the plants might look similar. For him more than for anyone else the early books of botany emphasized the distinctions between these two plants. And so it was with other true and false sorts.

Now that poverty has been abolished, a man out of a job has a dozen begging for his services, and drugs are made in vats from coal tar, petroleum and salt, the herb gatherer vanishes unwept, or he may persist a while in distant places. And with his passing the utilitarian value of our wild plants goes too, leaving them to multiply around us once more if they can find a little unpaved space. If we choose, we may drop their false titles and substitute names suited to Audubon societies and nature clubs.

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